OWNER'S MANUAL

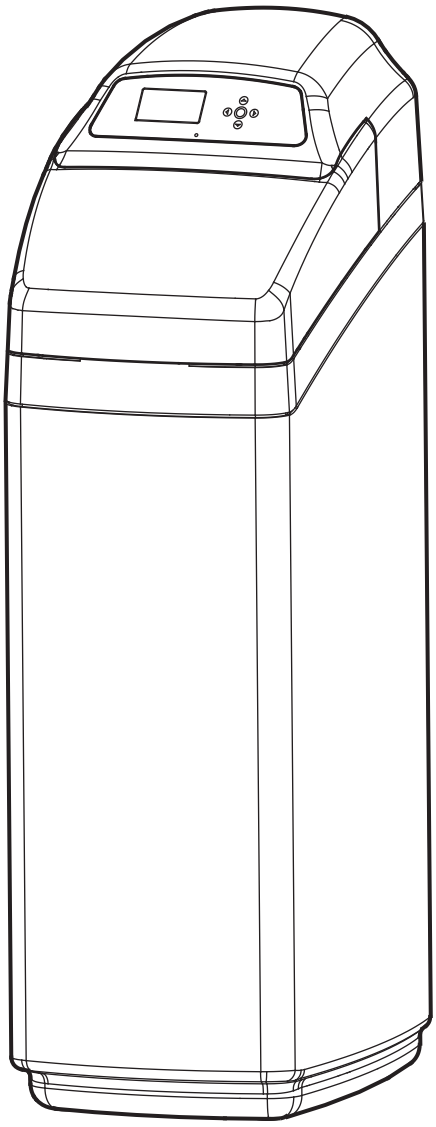
How to operate your
EcoWater Systems
Water Conditioner

ECOWATER SYSTEMS®

EcoWater Systems

Models

ESM18CE+
ESM25CE+
& ESM42HTE+



Version 03-2007 EWS Europe

TABLE OF CONTENTS

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 49°C. **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. Avoid installing were rodents, vermin, pets or any other animal can demage the unit.

The EcoWater Systems conditioner requires a minimum water flow of 11 liters per minute at the inlet. **Maximum allowable inlet water pressure is 8.6 bar.** If daytime pressure is over 5.5 bar, 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, 50 Hz electrical power only.** Be sure to use the included transformer and plug it into a nominal 220V, 50 Hz 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, 24V, 10 VA transformer.

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.

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 the equipment.

TYPICAL INSTALLATION DRAWINGS

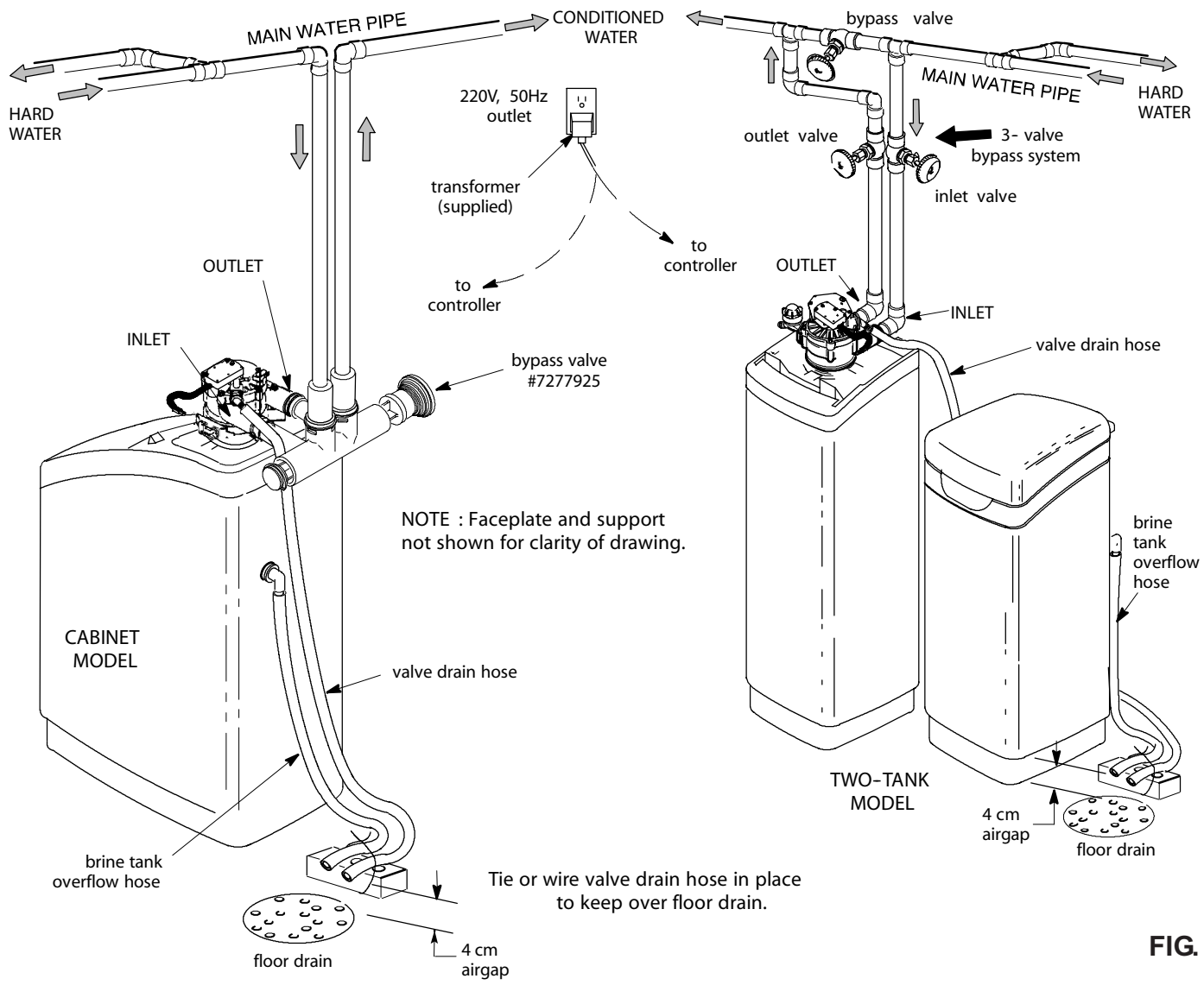


FIG. 1

INLET / OUTLET PLUMBING OPTIONS

- ALWAYS INSTALL either an EcoWater Systems bypass valve #7277925 (ESM 18 and 25), 7227140 (ESM 42), 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 recharge discharge water. A floor drain is preferred, close to the EcoWater Systems conditioner. A laundry tub, standpipe, etc., are other options (See Figure 2).
- A 220V, 50 Hz, grounded, continuously "live" electrical outlet is needed, in a dry location within 2 meters of the EcoWater Systems conditioner.

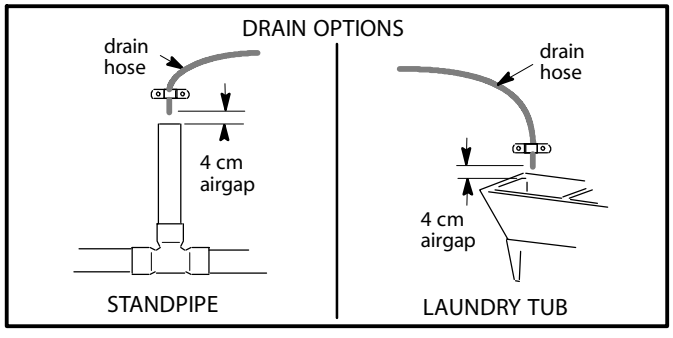


FIG. 2

NOTE: . A licensed plumber shall be used for this installation.

1. UNPACKING

EcoWater Systems conditioner models ESM18CE+, ESM25CE+ and ESM42HTE+ are shipped from the factory in one master carton. The carton also includes a bag of small parts needed to assemble and install the unit.

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 in the bag(s) until you are ready to use them. Minimal assembly is needed on all two tank models.

2. INSTALL ECOWATER BYPASS VALVE

If installing an **EcoWater Systems Bypass Valve**, put lubricated o-ring seals onto both bypass valve ports (See Figure 3B). Carefully slide the bypass valve into the softener valve and install the "C" clips.

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

3. 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.

4. 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. Adaptors are available from EcoWater, contact your local dealer.

5. ASSEMBLE INLET & OUTLET PLUMBING

Measure, cut, and loosely assemble pipe and fittings from the main water pipe (or from the bypass valves installed in Step 4), to the inlet and outlet adaptors or EcoWater bypass, installed in Step 4 or 2.

Be sure **hard water** supply pipe **goes to** the **valve inlet side**. Trace the water flow direction to be sure.

6. CONNECT INLET & 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 ground clamps on copper tubes before soldering (See Step 7a).

continued

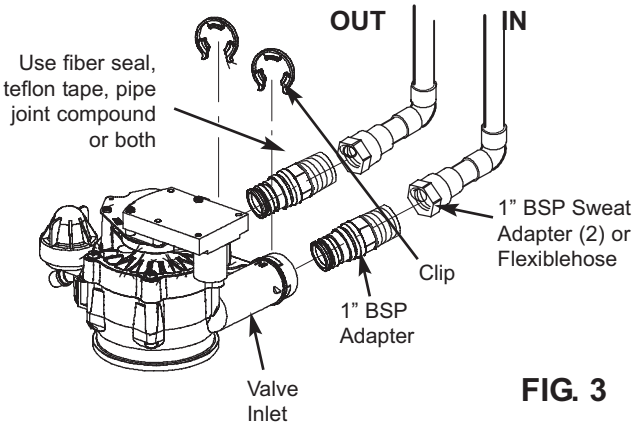


FIG. 3

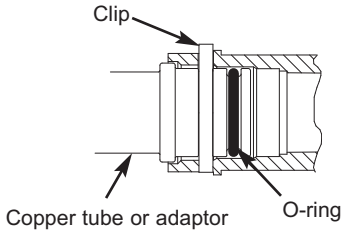


FIG. 3A

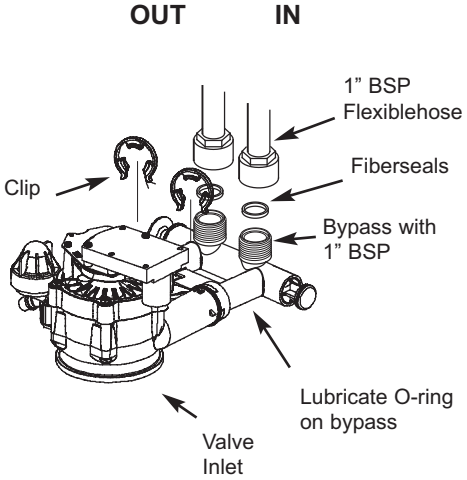


FIG. 3B

(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 **6a** 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 **6a** above.

7. 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 **7a** or **7b** following.

a. Use a ground clamp kit (parts not included) to make a jumper across the inlet and outlet copper tubes (See Figure 4A).

b. Install a #4 copper wire across the removed section of main water pipe, securely clamping at both ends (See Figure 4B) – parts not included.

8. INSTALL VALVE DRAIN HOSE

NOTE: See valve drain options on Page 4.

a. Elevating the drain hose may cause back pressure that could reduce the brine draw during recharge. If raising the drain line overhead is required to get to the drain point, measure the inlet water pressure to the softener first. For inlet pressures between 1.4 and 3.4 bar, do not raise higher than 2 metres above the floor. For inlet pressure above 3.4 bar, the drain line may be raised to a maximum height of 3 metres.

b. 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.

c. 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 recharges. Be sure to provide a 4 cm minimum air gap, to prevent possible sewer water backup.

9. 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.

10. On Two-tank models, connect the brine tubing to the nozzle and venturi housing.

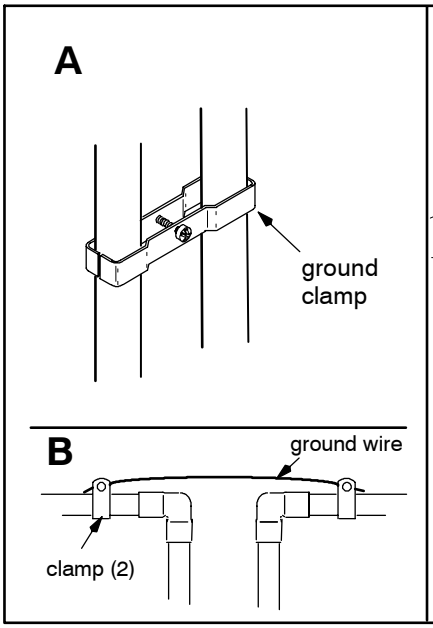
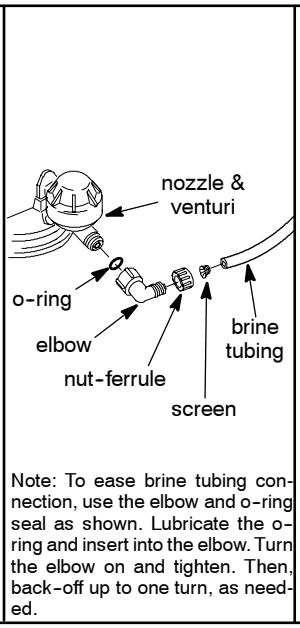


FIG. 4



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.

FIG. 5

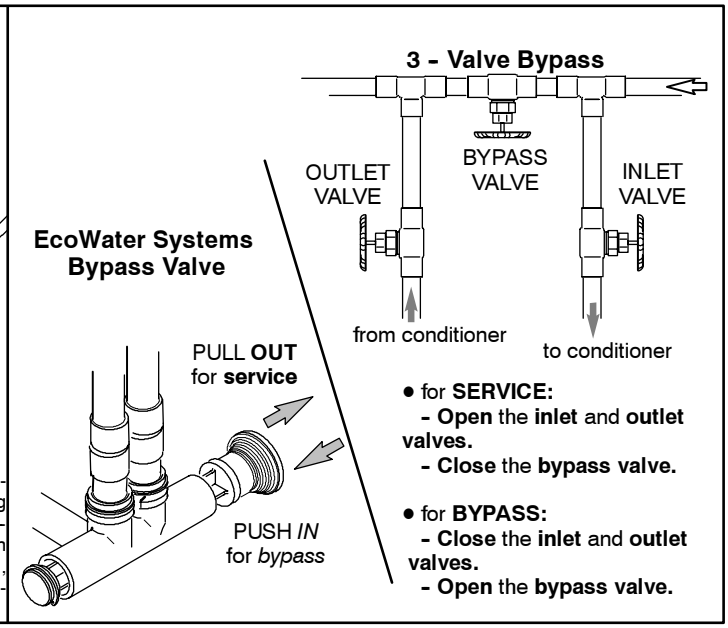


FIG. 6

11. PRESSURE TESTING FOR LEAKS

To prevent excessive air pressure in the EcoWater Systems conditioner and plumbing system, do the following steps EXACTLY in order:

a. Fully open two or more **conditioned** cold water faucets nearby the EcoWater Systems conditioner.

b. Place the bypass valve(s) in **bypass** position (See Figure 6).

c. Fully open the main water supply valve. Watch until the flow from the opened faucets becomes steady, with no spurting or air bubbles.

d. **EXACTLY** as follows, place bypass valve(s) into **service**:

(1) SINGLE BYPASS VALVE: **Slowly** move the valve stem toward **service** position, pausing serveral times to allow the unit to pressurize slowly.

(2) 3-VALVE BYPASS: Fully close the **bypass** valve and open the **outlet** valve. **Slowly** open the **inlet** valve, pausing serveral times to allow the unit to pressurize slowly.

e. After about three minutes, open a hot water faucet for one minute, or until all air is expelled, then close.

f. Close all cold water faucets and check your plumbing work for leaks.

12. ADD WATER AND SALT TO THE BRINE TANK

a. Using a pail or garden hose, add about 10 liters 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. Level the salt when finished adding. 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 28.

NOTE: See page 21 for additional information on salt.

13. SANITIZING THE ECOWATER SYSTEMS CONDITIONER

Care is taken at the factory to keep your EcoWater System conditioner clean and sanitary. However, during shipping, storage, installing and operating, bacteria could get into the unit. For this reason, sanitizing as follows is suggested* when installing.

continued

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

a. Remove the brinewell cover and pour about 40 ml. (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.

b. The final step in the sanitizing procedure is done as you complete the following steps, including electronic controller programming on page 7.

14. CONNECT TRANSFORMER

Plug the transformer into a continuously “live,” grounded, 220V, 50Hz house electrical outlet, in a dry location and approved by local codes. **The unit works on 24V 50 Hz only. Do not connect without the transformer.**

15. PROGRAM THE ELECTRONIC CONTROLLER

Follow the Setup Procedure on Page 7 to program the electronic controller with basic operating information, such as time and water hardness. After completing Steps 1 through 14 of the setup procedure on Page 7, continue with Step 16 below.

16. START A RECHARGE

From the rolling status screens, press the SELECT (○) button to display the **Main menu**. Make sure **Recharge** is highlighted, then press SELECT (○). Press DOWN (▼) to scroll to **Recharge Now**, then press SELECT (○) twice. You should hear the valve motor run as the EcoWater Systems conditioner begins recharging. This recharge draws the sanitizing bleach into and through the conditioner. Any air remaining in the unit is purged to the drain.

17. RESTART THE WATER HEATER

Turn on the electric or fuel supply to the water heater, and light the pilot, if applies.

NOTE: 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 16) is complete, then drain the water heater until water runs cold.

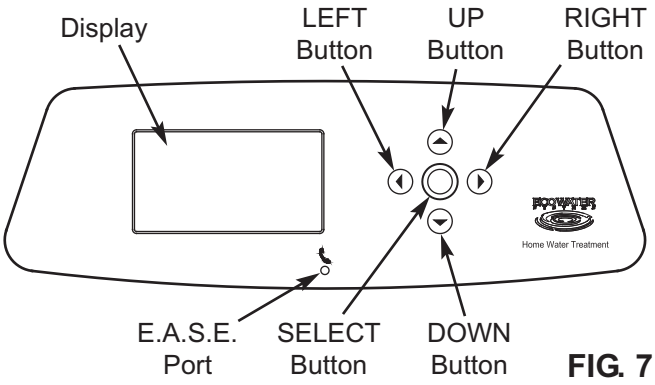


FIG. 7

SETUP PROCEDURE

When the EcoWater Systems softener is plugged in for the first time, a beep sounds and the display briefly shows a logo, followed by model information. Next, a series of six "wizard" screens prompts you to enter basic operating information:

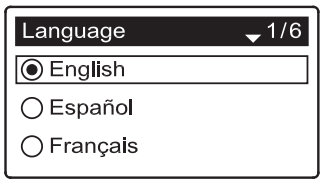


FIG. 8

1. **LANGUAGE** If the desired language already has a black dot next to it (See Figure 8), go to Step 2. Otherwise, press the softener's DOWN (▼) or UP (▲) buttons to scroll to the desired language, then press the SELECT (○) button to choose it.
2. Press the SELECT (○) button to advance to the next "wizard" screen.

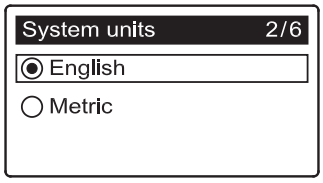


FIG. 9

3. **SYSTEM UNITS** If the desired system already has a black dot next to it (See Figure 9), go to Step 4. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the desired system, then press the SELECT (○) button to choose it.
4. Press the SELECT (○) button.

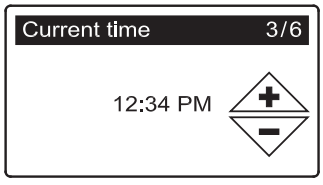


FIG. 10

5. **CURRENT TIME** Press the DOWN (▼) or UP (▲) buttons to set the current time (See Figure 10). Hold the button down to rapidly advance. Be sure that AM or PM is correct. If the system units were set to metric in Step 3, the clock will be in 24-hour format.
6. Press the SELECT (○) button.

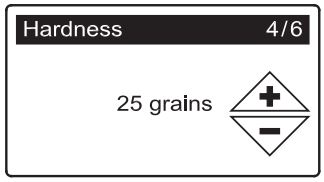


FIG. 11

7. **HARDNESS** Press the UP (▲) or DOWN (▼) buttons to set the value of your water's hardness (See Figure 11).

> **NOTE:** Do not increase the hardness setting to compensate for iron in your water. The electronic control compensates automatically after you set the iron level in Step 11, below.

8. Press the SELECT (○) button.

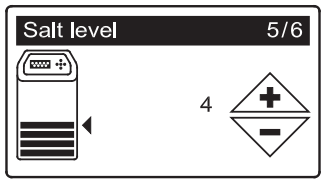


FIG. 12

9. **SALT LEVEL** Press the UP (▲) or DOWN (▼) buttons to set the salt level (See Figure 12). It should match the lowest number visible on the brinewell decal above the salt.
10. Press the SELECT (○) button.

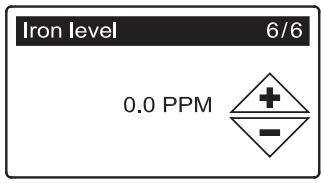


FIG. 13

11. **IRON LEVEL** Press the UP (▲) or DOWN (▼) buttons to set the value for iron in your water (See Figure 13).
12. Press the SELECT (○) button. The screen will show "Setup complete!" (See Figure 14).

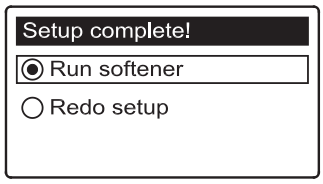
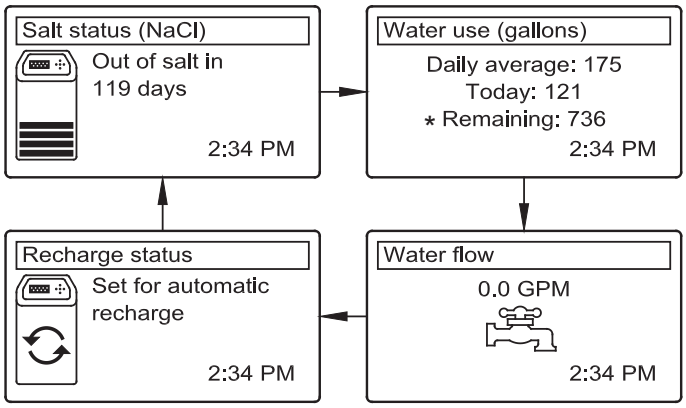


FIG. 14

13. If, at this point, you want to go back and make changes, press the DOWN (▼) button to scroll to **Redo setup**, then press the SELECT (○) button twice to repeat the six "wizard" screens.
14. If no changes are desired, make sure **Run softener** has a black dot next to it (See Figure 14) and press the SELECT (○) button. The softener begins normal operation, described on the next page.

SOFTENER STATUS SCREENS

During normal operation, the EcoWater Systems softener's display shows up to four status screens (Page 13 explains how individual screens can be turned on or off). Each is shown for six seconds, in a rolling sequence (See Figure 15).



*Water remaining before the next recharge. **FIG. 15**

Pressing the softener's RIGHT (▸) button manually advances to the next screen in the sequence. Pressing the LEFT (◂) button manually returns to the previous status screen. If no buttons are pressed for 30 seconds, the automatic rolling sequence resumes.

OTHER MESSAGES, ALERTS & REMINDERS

The softener status screens described above will not be displayed in a rolling sequence when one of the following items is displayed:

- **Recharge status** (Displayed during recharges, showing valve position and time remaining)
- **Add salt** or **Out of salt** (See Page 21)
- **Current time** setting screen instead of status screens indicates time has been lost, perhaps after a long power loss. Set the time (See Page 11).
- **Service reminder** (See Page 19)
- **Error detected** (Contact your dealer for service)

FLASHING BACKLIGHT

The softener's display is backlit to make it easy to read. The backlight will flash on and off when one or more of the following conditions occurs:

- Salt needs to be added
- Time needs to be set (Time has been lost)
- Service is overdue (Service reminder)
- Error condition

The flashing will stop after any key is pressed. However, it will start again at Midnight if the underlying condition (e.g. low salt level) has not been addressed.

MAIN MENU

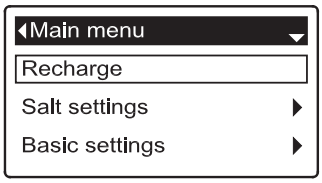


FIG. 16

During normal operation (status screens rolling), press the softener's SELECT (○) button to display the Main menu (See Figure 16). This menu and its subsidiary screens are used to control these softener operations:

- **Recharge** (See Page 11)
- **Salt settings**
  - **Salt level** (See Page 10)
  - **Low salt alarm** (See Page 10)
  - **Salt type** (See Page 10)
- **Basic settings**
  - **Current time** (See Page 11)
  - **Hardness** (See Page 12)
  - **Iron level** (See Page 12)
  - **Recharge time** (See Page 12)
  - **Rolling screens** (See Page 13)
- **User preferences**
  - **Language** (See Page 13)
  - **Time format** (See Page 14)
  - **Volume units** (See Page 14)
  - **Hardness units** (See Page 14)
  - **Weight units** (See Page 14)
- **System information**
  - **Model information** (See Page 15)
  - **Water available** (See Page 15)
  - **Daily avg. water used** (See Page 15)
  - **Water used today** (See Page 15)
  - **Total water used** (See Page 15)
  - **Current water flow** (See Page 15)
  - **Days powered up** (See Page 15)
  - **Last recharge** (See Page 15)
  - **Total recharges** (See Page 15)
- **Advanced settings**
  - **Cycle times**
    - **Backwash time** (See Page 16)
    - **2nd backwash** (See Page 16)
    - **2nd backwash time** (See Page 16)
    - **Fast rinse time** (See Page 16)
  - **Special features**
    - **Efficiency mode** (See Page 17)
    - **Max. days between recharges** (See Page 17)
    - **Auxiliary control** (See Page 18)
    - **Chemical feed volume**** (See Page 18)
    - **Chemical feed timer**** (See Page 18)
    - **97% feature** (See Page 17)
    - **Service reminder** (See Page 19)
  - **Troubleshooting**
    - **Send E.A.S.E. message** (See Page 19)
    - **Diagnostics** (See Page 19)
    - **Setup changes** (See Page 20)
  - **Connect to remote** (See Page 9)

**Only displayed if Auxiliary control is set to Chemical feed.

CONNECTING TO REMOTE (US Only)

When the softener's electronic control is first powered up, it is not yet in communication with the remote. Do the following to establish a link between the two:

1. This procedure involves pushing buttons on both the softener and remote, so have the remote near the softener for now. Make sure the remote is powered up (See "Installing Batteries" in remote manual).
2. From any of the rolling status screens, press the softener's SELECT (○) button to display the **Main menu**.
3. Press the softener's DOWN (▼) button to scroll through the menu options until **Advanced settings** is highlighted (See Figure 17).

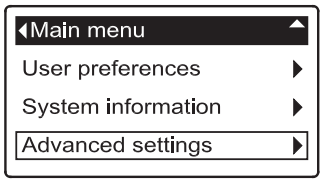


FIG. 17

4. Press the softener's SELECT (○) button to display the Advanced settings menu (See Figure 18).

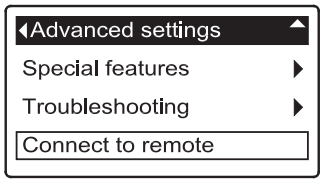


FIG. 18

5. Press the softener's DOWN (▼) button to scroll through the menu options until **Connect to remote** is highlighted.
6. If the remote does not already show a menu screen, press the remote's SELECT (○) button to display a **Menu** screen.
7. Press the remote's DOWN (▼) button to scroll through the menu options until **Add new device** is highlighted in a box.
8. Press the remote's SELECT (○) button, and the "Waiting for new device..." screen appears. The remote waits two minutes for the softener to be activated (in the next step).
9. Make sure the softener's display still shows the screen in Figure 18. Press the softener's SELECT (○) button to display the "Looking for remote" screen (See Figure 19).

continued

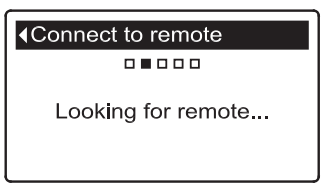


FIG. 19

10. Within a few seconds the screen should change to show "Remote found" (See Figure 20). If, after about one minute, the softener's screen instead reads "New remote not found," press the softener's SELECT (○) button to return to the screen in Figure 18 and press the remote's LEFT (◀) button to return to the remote's Menu screen. Then repeat this procedure from Step 8. If the remote is not found after several tries, contact your dealer for service. Take note of the message on the remote's screen after an unsuccessful attempt, as it indicates the nature of the problem.

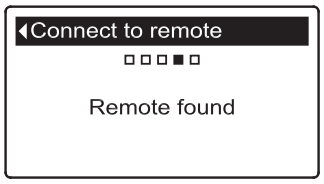


FIG. 20

11. Press the softener's SELECT (○) button. The display will go back to the Advanced settings menu (Figure 18).
12. Press the softener's LEFT (◀) button twice to return to the rolling status screens.

LONG DISPLAY SCREEN MESSAGES

Most messages in the softener's display screens are short enough to be shown as a single line. Longer messages will be truncated (See Figure 21 for an example) until you highlight them.

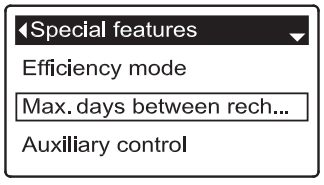


FIG. 21

One second after being highlighted, the viewing box expands (See Figure 22) to show the entire message. After three seconds the view resets (Figure 21).

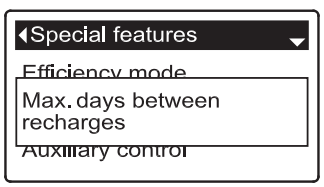


FIG. 22

SETTING SALT LEVEL

Use this feature when adding salt to the softener.

Procedure for Cabinet Models

1. When the softener is displaying the rolling status screens, open the salt lid. The tank light turns on and the Salt level screen appears (See Figure 23).

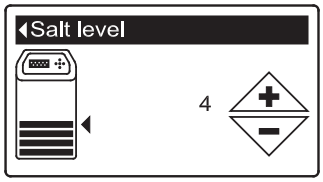


FIG. 23

2. After adding and leveling salt, observe the numbered decal on the brinewell. Press UP (▲) or DOWN (▼) to change the salt level to match the lowest number visible on the brinewell decal above the salt.
3. Close the salt lid. The tank light turns off and the display goes back to the rolling status screens.

Procedure for Two-tank Models

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **Salt settings** is highlighted (See Figure 24).

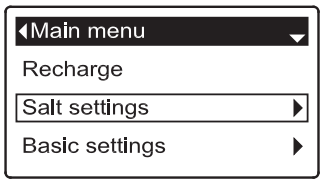


FIG. 24

3. Press the SELECT (○) button to display the Salt settings menu (See Figure 25).

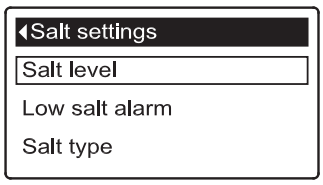


FIG. 25

4. Make sure **Salt level** is highlighted.
5. Press the SELECT (○) button to display the Salt level screen (See Figure 23). This screen will not automatically exit for 15 minutes.
6. After adding and leveling salt, observe the numbered decal on the brinewell. Press UP (▲) or DOWN (▼) to change the salt level to match the lowest number visible on the brinewell decal above the salt.
7. Press the SELECT (○) button. The display will go back to the Salt settings menu (Figure 25).
8. Press the LEFT (◀) button twice to return to the rolling status screens. It will also exit automatically if no buttons are pressed for four minutes.

LOW SALT ALARM

Use this feature to program when the electronic control will display a low salt alarm. The number of days can be customized, or the feature can be turned off. The default is 30 days.

1-3. Go to the **Salt settings** menu by following Steps 1-3 in "Procedure for Two-tank Models" at left.

4. Press the DOWN (▼) button to scroll through the menu options until **Low salt alarm** is highlighted.
5. Press the SELECT (○) button to display the Low salt alarm screen (See Figure 26).

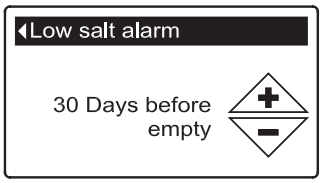


FIG. 26

6. Press the UP (▲) or DOWN (▼) buttons to change the number of days. Set the number of days to provide enough time to purchase salt and avoid running into hard water. Setting the number of days below 1 turns the alarm feature off.
7. Press the SELECT (○) button. The display will go back to the Salt settings menu.
8. Press the LEFT (◀) button twice to return to the rolling status screens.

SETTING SALT TYPE

Use this feature to program the electronic control with which type of salt is used. The default is NaCl.

1-3. Go to the **Salt settings** menu by following Steps 1-3 in "Procedure for Two-tank Models" at left.

4. Press the DOWN (▼) button to scroll through the menu options until **Salt type** is highlighted.
5. Press the SELECT (○) button to display the Salt type menu (See Figure 27).

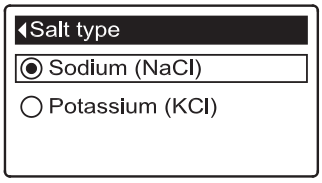


FIG. 27

6. If the desired salt type already has a black dot next to it (See Figure 27), go to Step 7. Otherwise, press the softener's DOWN (▼) or UP (▲) buttons to scroll to the other salt type, then press SELECT (○) to choose it.
7. Press the SELECT (○) button. The display will go back to the Salt settings menu.
8. Press the LEFT (◀) button twice to return to the rolling status screens.

RECHARGING THE SOFTENER

This feature may be used to assure an adequate supply of softened water at times of unusually high water use. For example, if you have guests and the "Water available" screen (See Page 16) is at or below 50%, you could deplete softened water capacity before the next automatic recharge. Initiating a manual recharge will restore 100% softened water capacity after complete.

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.

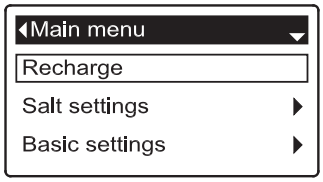


FIG. 28

2. Make sure **Recharge** is highlighted (See Figure 28).
3. Press the SELECT (○) button to display the Recharge menu (See Figure 29).

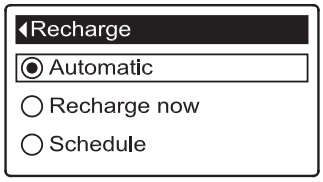


FIG. 29

4. If the desired option already has a black dot next to it (See Figure 29), go to Step 5. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the desired option, then press SELECT (○) to choose it.
   - **Automatic** cancels a manually scheduled recharge (if it has not already begun) and lets the electronic control determine when to recharge next.
   - **Recharge now** begins a recharge immediately after the SELECT (○) button is pushed again in Step 5.
   - **Schedule** sets a recharge to begin at the preset recharge time (set according to the instructions on Page 12).
5. Press the SELECT (○) button. If **Recharge now** is selected, the display immediately goes to the Recharge status screen (See Figure 30). If **Automatic** or **Schedule** are selected, the display goes back to the Main menu (Figure 28).

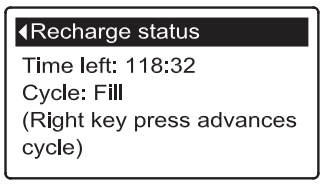


FIG. 30

6. Press the LEFT (◀) button (twice from the Recharge status screen) to return to the rolling status screens.

SETTING THE CURRENT TIME

When the softener's electronic control is first powered up, a "wizard" screen prompts you to set the current time (See Page 7). To change the time at a later date, such as after a long power loss:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **Basic settings** is highlighted (See Figure 31).

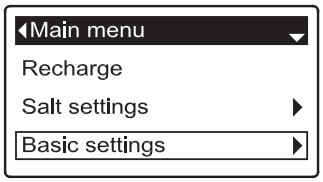


FIG. 31

3. Press the SELECT (○) button to display the Basic settings menu (See Figure 32).

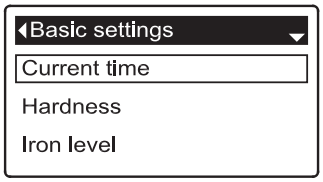


FIG. 32

4. Make sure **Current time** is highlighted.
5. Press the SELECT (○) button to display the Current time screen (See Figure 33).

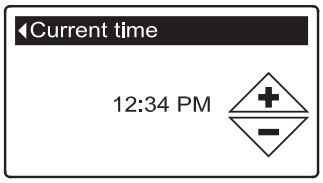


FIG. 33

6. Press the UP (▲) or DOWN (▼) buttons to change the time. Hold the button down to rapidly advance. Be sure that AM or PM is correct (unless softener is set for a 24-hour clock).
7. Press the SELECT (○) button. The display will go back to the Basic settings menu (Figure 32).
8. Press the LEFT (◀) button twice to return to the rolling status screens.

SETTING RECHARGE TIME

When the softener's electronic control is first powered up, the default time for starting an automatic recharge is 2:00 a.m. This is a good time in most households because water is not being used. To change this time:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.

2. Press the DOWN (▼) button to scroll through the menu options until **Basic settings** is highlighted (See Figure 34).

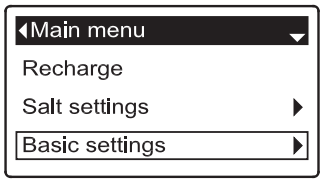


FIG. 34

3. Press the SELECT (○) button to display the Basic settings menu (See Figure 35).

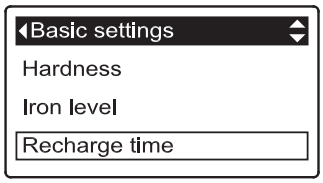


FIG. 35

4. Press the DOWN (▼) button to scroll through the menu options until **Recharge time** is highlighted.

5. Press the SELECT (○) button to display the Recharge time screen (See Figure 36).

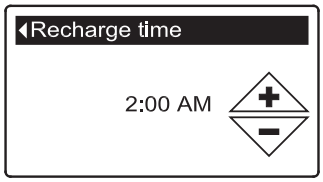


FIG. 36

6. Press the UP (▲) or DOWN (▼) buttons to change the recharge time in 1 hour increments. Hold the button down to rapidly advance. Be sure that AM or PM is correct (unless softener is set for a 24-hour clock).

7. Press the SELECT (○) button. The display will go back to the Basic settings menu (Figure 35).

8. Press the LEFT (◀) button twice to return to the rolling status screens.

SETTING HARDNESS

When the softener's electronic control is first powered up, a "wizard" screen prompts you to enter your water's hardness (See Page 7). To change it:

1-3. Go to the **Basic settings** menu by following Steps 1-3 in "Setting Recharge Time" at left.

4. Press the DOWN (▼) button to scroll through the menu options until **Hardness** is highlighted.

5. Press the SELECT (○) button to display the Hardness screen (See Figure 37).

Note

1 grain = 1 °d
10 ppm = 1 °F

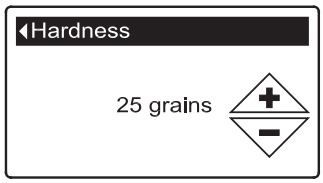


FIG. 37

6. Press the UP (▲) or DOWN (▼) buttons to set the value for your water's hardness. Hold the button down to rapidly advance.

NOTE: Do not increase the hardness setting to compensate for iron in your water. The electronic control compensates automatically after you set the iron level, below.

7. Press the SELECT (○) button. The display will go back to the Basic settings menu.

8. Press the LEFT (◀) button twice to return to the rolling status screens.

SETTING IRON LEVEL

When the softener's electronic control is first powered up, a "wizard" screen prompts you to enter your water's iron level (See Page 7). To change it:

1-3. Go to the **Basic settings** menu by following Steps 1-3 in "Setting Recharge Time" at left.

4. Press the DOWN (▼) button to scroll through the menu options until **Iron level** is highlighted.

5. Press the SELECT (○) button to display the Iron level screen (See Figure 38).

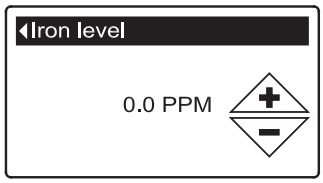


FIG. 38

6. Press the UP (▲) or DOWN (▼) buttons to set the value for iron in your water. Hold the button down to rapidly advance.

7. Press the SELECT (○) button. The display will go back to the Basic settings menu.

8. Press the LEFT (◀) button twice to return to the rolling status screens.

MODIFYING ROLLING SCREENS

During normal softener operation, four status screens are shown in sequence (See "Softener Status Screens" on Page 8). When the softener's electronic control is first powered up, the default is to show all four. You can turn on/off individual screens*:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **Basic settings** is highlighted (See Figure 39).

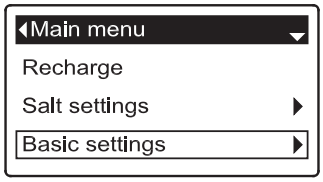


FIG. 39

3. Press the SELECT (○) button to display the Basic settings menu (See Figure 40).

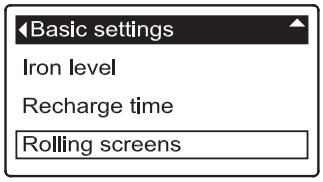


FIG. 40

4. Press the DOWN (▼) button to scroll through the menu options until **Rolling screens** is highlighted.
5. Press the SELECT (○) button to display the Rolling screens menu (See Figure 41).

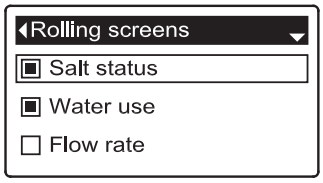


FIG. 41

6. Press the DOWN (▼) or UP (▲) buttons to scroll through the list. Items with a black square next to them will be displayed during normal operation.
7. To un-select a screen, make sure its name is highlighted in a box. Then press the SELECT (○) button. The black square will disappear. Pressing SELECT (○) again makes the black square reappear and re-selects the highlighted item. At least one screen must be selected/highlighted.
8. When selections are complete, exit this menu by pressing the LEFT (◀) button. The display will go back to the Basic settings menu (Figure 40).
9. Press the LEFT (◀) button twice to return to the rolling status screens.

*This does not include service reminders, errors, alerts or Recharge status screens.

SETTING THE LANGUAGE

When the softener's electronic control is first powered up, a "wizard" screen prompts you to set the language (See Page 7). Language is set independently on the softener and remote. To change the softener's language:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **User preferences** is highlighted (See Figure 42).

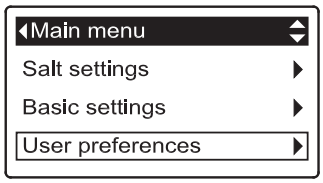


FIG. 42

3. Press the SELECT (○) button to display the User preferences menu (See Figure 43).

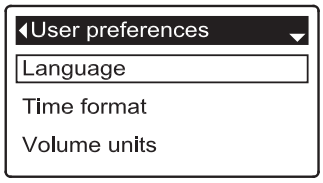


FIG. 43

4. Make sure **Language** is highlighted.
5. Press the SELECT (○) button to display the Language menu (See Figure 44).

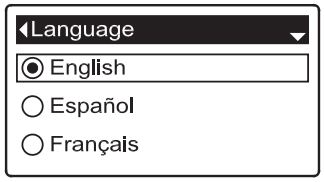


FIG. 44

6. If the desired language already has a black dot next to it (See Figure 44), go to Step 7. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the desired language, then press SELECT (○) to choose it. The choices are: English, Spanish, French, Italian, German, Dutch, Polish, Russian, Hungarian, Turkish, Lithuanian, Greek or Romanian.
7. Press the SELECT (○) button. The display will go back to the User preferences menu (Figure 43).
8. Press the LEFT (◀) button twice to return to the rolling status screens.

TO SET THE SOFTENER TO ENGLISH IF ANOTHER LANGUAGE IS DISPLAYED:

From the rolling status screens, press SELECT (○). Press DOWN (▼) three times, then press SELECT (○) twice. Press UP (▲) to scroll to **English** at the top of the list, then press SELECT (○) twice. Press LEFT (◀) twice to exit all menus.

SETTING TIME FORMAT

Use this feature to select a 12-hour (AM/PM) or 24-hour clock.

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **User preferences** is highlighted.
3. Press the SELECT (○) button to display the User preferences menu.
4. Press the DOWN (▼) button to scroll through the menu options until **Time format** is highlighted.
5. Press the SELECT (○) button to display the Time format menu (See Figure 45).

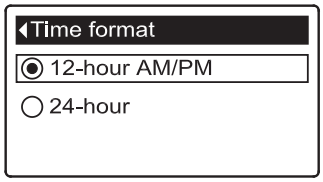


FIG. 45

6. If the desired time format already has a black dot next to it (See Figure 45), go to Step 7. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the other time format, then press SELECT (○) to choose it.
7. Press the SELECT (○) button. The display will go back to the User preferences menu.
8. Press the LEFT (◀) button twice to return to the rolling status screens.

SETTING VOLUME UNITS

Use this feature to select gallons or liters as volume units.

1-3. Go to the **User preferences** menu by following Steps 1-3 in "Setting Time Format" above.
4. Press the DOWN (▼) button to scroll through the menu options until **Volume units** is highlighted.
5. Press the SELECT (○) button to display the Volume units menu (See Figure 46).

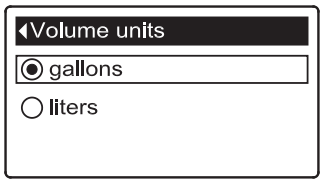


FIG. 46

6. If the desired volume unit already has a black dot next to it (See Figure 46), go to Step 7. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the other volume unit, then press SELECT (○) to choose it.
7. Press the SELECT (○) button. The display will go back to the User preferences menu.
8. Press the LEFT (◀) button twice to return to the rolling status screens.

SETTING HARDNESS UNITS

Use this feature to select grains or parts per million (ppm) as hardness units.

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **User preferences** is highlighted.
3. Press the SELECT (○) button to display the User preferences menu.
4. Press the DOWN (▼) button to scroll through the menu options until **Hardness units** is highlighted.
5. Press the SELECT (○) button to display the Hardness units menu (See Figure 47).

Note:
1 grain = 1°d
10 ppm = 1°F

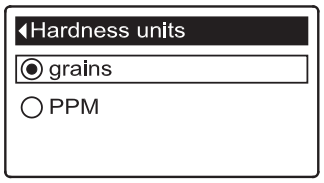


FIG. 47

6. If the desired hardness unit already has a black dot next to it (See Figure 47), go to Step 7. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the other hardness unit, then press SELECT (○) to choose it.
7. Press the SELECT (○) button. The display will go back to the User preferences menu.
8. Press the LEFT (◀) button twice to return to the rolling status screens.

SETTING WEIGHT UNITS

Use this feature to select pounds or kilograms as weight units.

1-3. Go to the **User preferences** menu by following Steps 1-3 in "Setting Hardness Units" above.
4. Press the DOWN (▼) button to scroll through the menu options until **Weight units** is highlighted.
5. Press the SELECT (○) button to display the Weight units menu (See Figure 48).

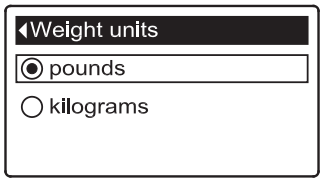


FIG. 48

6. If the desired weight unit already has a black dot next to it (See Figure 48), go to Step 7. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the other weight unit, then press SELECT (○) to choose it.
7. Press the SELECT (○) button. The display will go back to the User preferences menu.
8. Press the LEFT (◀) button twice to return to the rolling status screens.

SYSTEM INFORMATION

Use these features to look up the following information about the softener and its operations:

- **Model information** (model number and software version)
- **Water available** (softened water ready for use)
- **Daily average water used**
- **Water used today**
- **Total water used** (explained in Step 6, below)
- **Current water flow**
- **Days powered up**
- **Last recharge**
- **Total recharges**

To display one of these screens:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▾) button to scroll through the menu options until **System information** is highlighted (See Figure 49).

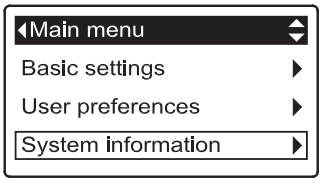


FIG. 49

3. Press the SELECT (○) button to display the System information menu (See Figure 50).

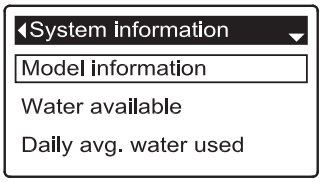


FIG. 50

4. Press the DOWN (▾) button to scroll through the menu options until the desired option is highlighted (See list at the top of this column).
5. Press the SELECT (○) button to display the desired information screen (See Figures 51-59).
6. The **Total water used** screen (See Figure 55) shows the volume of water used since it was last reset (it works like the trip odometer in a car). To reset the value to 0, press the RIGHT (▸) button while this screen is displayed.
7. When finished viewing an information screen, press the SELECT (○) button. The display will go back to the System information menu (Figure 50). It will also exit automatically if no buttons are pressed for four minutes.
8. Press the LEFT (◂) button twice to return to the rolling status screens.

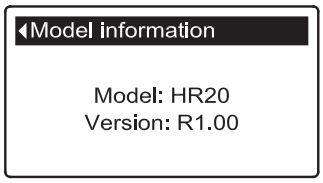


FIG. 51

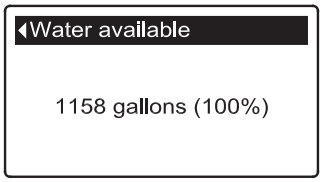


FIG. 52

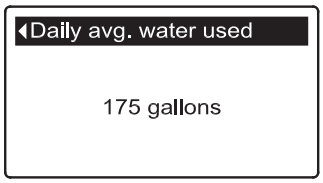


FIG. 53

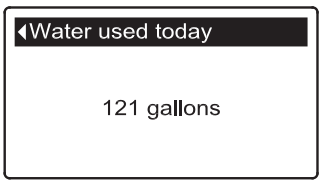


FIG. 54

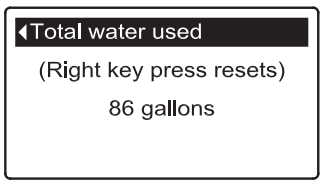


FIG. 55

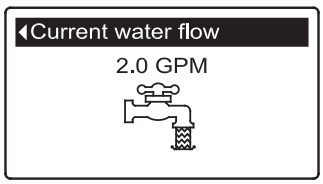


FIG. 56

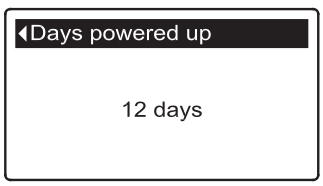


FIG. 57

FIG. 58

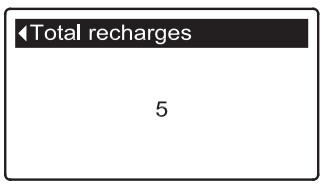


FIG. 59

CYCLE TIMES

Use these features to change the following softener operations:

- **Backwash time**
- **Second backwash** (turn on or off)
- **Second backwash time**
- **Fast rinse time**

To display these screens:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **Advanced settings** is highlighted (See Figure 60).

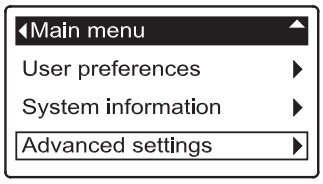


FIG. 60

3. Press the SELECT (○) button to display the Advanced settings menu (See Figure 61).

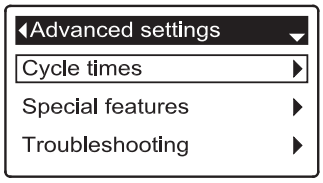


FIG. 61

4. Make sure **Cycle times** is highlighted.
5. Press the SELECT (○) button to display the Cycle times menu (See Figure 62).

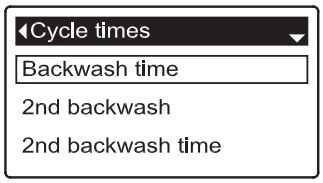


FIG. 62

6. Press the DOWN (▼) button to scroll through the menu options until the desired option is highlighted (See list at the top of this column).
7. Press the SELECT (○) button to display the desired information screen (See Figures 63-66).
8. **See the right column on this page for specific instructions on each cycle time screen.**
9. Press the SELECT (○) button. The display will go back to the Cycle times menu (Figure 62).
10. Press the LEFT (◀) button three times to return to the rolling status screens.

8a. **Backwash time**: Press the UP (▲) or DOWN (▼) buttons to change the backwash time. Hold the button down to rapidly advance. The backwash time can be set from 1 to 30 minutes* (See Figure 63).

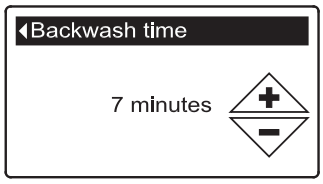


FIG. 63

8b. **Second backwash**: If the desired option already has a black dot next to it (See Figure 64), go to Step 9. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the other option, then press SELECT (○) to choose it. Setting this feature On adds a second backwash and rinse at the beginning of the recharge cycle. Default is Off. Set this feature On if your water supply contains a lot of sediment or iron.

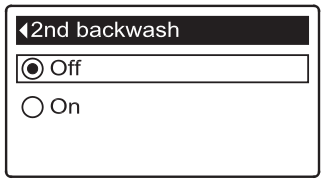


FIG. 64

8c. **Second backwash time**: Press the UP (▲) or DOWN (▼) buttons to change the second backwash time. Hold the button down to rapidly advance. The time can be set from 1 to 30 minutes (See Figure 65).

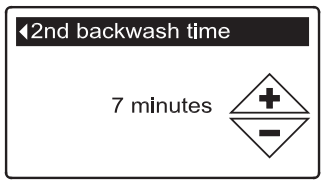


FIG. 65

8d. **Fast rinse time**: Press the UP (▲) or DOWN (▼) buttons to change the fast rinse time. Hold the button down to rapidly advance. The fast rinse time can be set from 1 to 30 minutes* (See Figure 66).

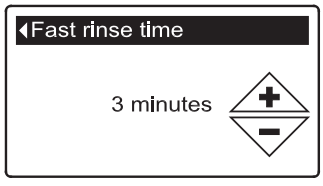


FIG. 66

*Reducing the backwash and fast rinse times below a softener model's default settings can result in salty water after recharges.

SPECIAL FEATURES

Use these features to change the following operations:

- **Efficiency mode**
- **Maximum days between recharges**
- **Auxiliary control** (described on Page 18)
- **Chemical feed volume*** (described on Page 18)
- **Chemical feed timer*** (described on Page 18)
- **97% feature**
- **Service reminder** (described on Page 19)

To display one these screens:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.

2. Press the DOWN (▼) button to scroll through the menu options until **Advanced settings** is highlighted (See Figure 67).

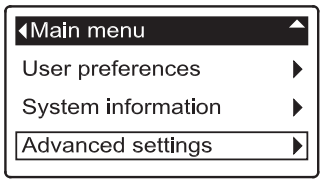


FIG. 67

3. Press the SELECT (○) button to display the Advanced settings menu (See Figure 68).

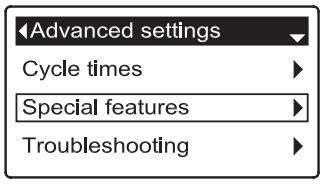


FIG. 68

4. Press the DOWN (▼) button to scroll through the menu options until **Special features** is highlighted.

5. Press the SELECT (○) button to display the Special features menu (See Figure 69).

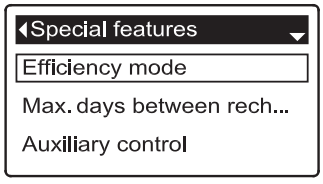


FIG. 69

6. Press the DOWN (▼) button to scroll through the menu options until the desired option is highlighted (See list at the top of this column).

7. Press the SELECT (○) button to display the desired information screen (See Figures 70-72).

8. **See the right column on this page for specific instructions on each cycle time screen.**

9. Press the SELECT (○) button. The display will go back to the Special features menu (Figure 69).

10. Press the LEFT (◀) button three times to return to the rolling status screens.

*Only displayed if Auxiliary control is set to Chemical feed.

8a. **Efficiency mode**: If the desired efficiency mode already has a black dot next to it (See Figure 70), go to Step 9. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the desired efficiency mode, then press SELECT (○) to choose it.

- **Salt efficient** limits available salt doses to maintain 4000 grains/lb.(57 °Fm³/Kg salt) of salt efficiency. Units may recharge more frequently.
- **Auto adjusting** is the default. It automatically adjusts salt doses to target a 3-4 day interval between recharges. Recommended.
- **High capacity** is for applications where very low "bleed" (less than 1.5 ppm) of hardness can be tolerated. Such applications include water for boilers. This setting will consume

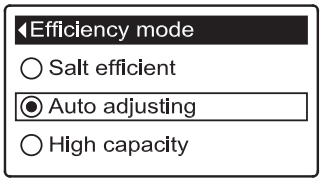


FIG. 70

8b. **Maximum days between recharges**: Press the UP (▲) or DOWN (▼) buttons to change the number of days (See Figure 71). The feature can be set from 1 to 15 days. Setting the number of days below 1 turns the feature off and defaults to automatic control of recharging.

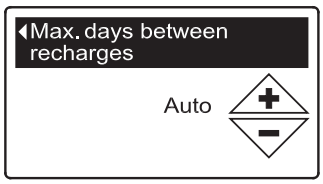


FIG. 71

8c. **97% feature**: If the desired option already has a black dot next to it (See Figure 72), go to Step 9. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the other option, then press SELECT (○) to choose it. If this feature is On, the softener will automatically recharge when 97% of capacity is used, at any time of day. Default is Off.

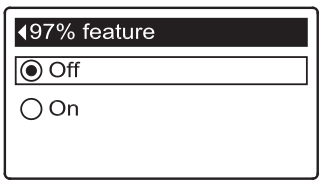


FIG. 72

AUXILIARY CONTROL

The electronic control has an auxiliary output which can control external devices in a water treatment system. The signal is 24V AC, current draw 800 mA maximum. The Auxiliary Output terminals are located on the electronic control board (See Schematic on Page 27).

For more details on the use of auxiliary controlled equipment in water treatment systems, consult the EcoWater Systems "Problem Water Guide."

To select an auxiliary control mode:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **Advanced settings** is highlighted.
3. Press the SELECT (○) button to display the Advanced settings menu.
4. Press the DOWN (▼) button to scroll through the menu options until **Special features** is highlighted.
5. Press the SELECT (○) button to display the Special features menu (See Figure 73).

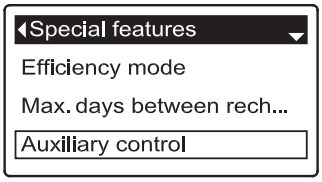


FIG. 73

6. Press the DOWN (▼) button to scroll through the menu options until **Auxiliary control** is highlighted.
7. Press the SELECT (○) button to display the Auxiliary control menu (See Figure 74).
8. If the desired option already has a black dot next to it (See Figure 74), go to Step 9. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the desired option, then press SELECT (○) to choose it.
   - **Off** is the default.
   - **Chlorine** can be used to drive a chlorine generator, which produces chlorine, as brine water passes through it, to sanitize the resin during recharges.
   - **Bypass** turns 24V AC on during the brine, backwash and fast rinse portions of the cycle (when the softener's valve is in bypass and hard water is being supplied to the house).
   - **Chemical feed** can be used to run a chemical feed pump. If chosen, the chemical feed volume and timer must be set, as detailed at right)
   - **Water use** turns 24V AC on when the softener's turbine indicates water flow. Could be used to drive an air pump for iron or sulfur oxidation.
9. Press the SELECT (○) button. The display will go back to the Special features menu (Figure 73).
10. Press the LEFT (◀) button three times to return to the rolling status screens.

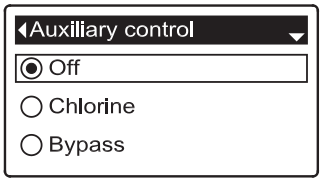


FIG. 74

CHEMICAL FEED

If the auxiliary control mode has been set to **Chemical feed**, as described in the previous section, two additional lines (**Chemical feed volume** and **Chemical feed timer**) will appear on the Special features menu.

To set these values:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **Advanced settings** is highlighted.
3. Press the SELECT (○) button to display the Advanced settings menu.
4. Press the DOWN (▼) button to scroll through the menu options until **Special features** is highlighted.
5. Press the SELECT (○) button to display the Special features menu (See Figure 73).
6. Press the DOWN (▼) button to scroll through the menu options until **Chemical feed volume** or **Chemical feed timer** is highlighted.
7. Press the SELECT (○) button to display the Chemical feed volume or Chemical feed timer menu (See Figures 75 & 76).

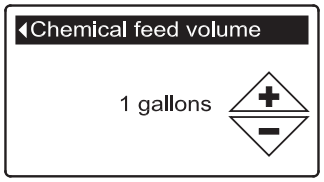


FIG. 75

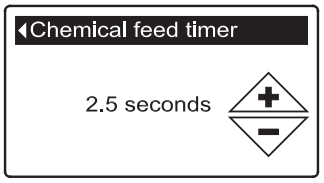


FIG. 76

8. Press the UP (▲) or DOWN (▼) buttons to change the value. Hold the button down to rapidly advance.
   - **Chemical feed volume** is the amount of water which will pass through the softener between each activation of the chemical feed equipment.
   - **Chemical feed timer** is how long the output to the chemical feed equipment is energized each time it is activated.
9. Press the SELECT (○) button. The display will go back to the Special features menu (Figure 73).
10. Press the LEFT (◀) button three times to return to the rolling status screens.

SERVICE REMINDER

Use this feature to program the number of months (up to 24) before a “Service overdue” message will appear instead of the rolling status screens (See Figure 77). This message also appears on the remote.

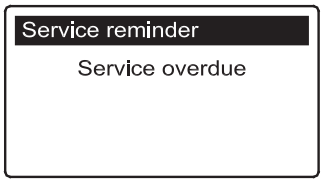


FIG. 77

This will be a reminder to call your dealer for service. Once it has been programmed, this screen displays the number of months and days left until the service reminder.

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **Advanced settings** is highlighted.
3. Press the SELECT (○) button to display the Advanced settings menu.
4. Press the DOWN (▼) button to scroll through the menu options until **Special features** is highlighted.
5. Press the SELECT (○) button to display the Special features menu (See Figure 78).

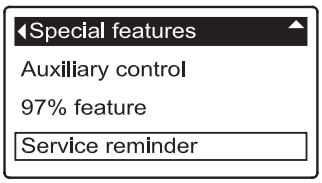


FIG. 78

6. Press the DOWN (▼) button to scroll through the menu options until **Service reminder** is highlighted.
7. Press the SELECT (○) button to display the Service reminder screen (See Figure 79).

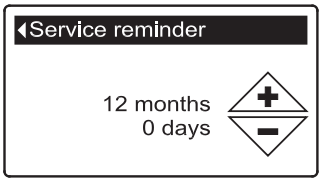


FIG. 79

8. Press the UP (▲) or DOWN (▼) buttons to set the number of months until the service reminder appears. Repeatedly pressing the DOWN (▼) button until the display reads “Off” turns this feature off and zeros the number of months and days.
9. Press the SELECT (○) button. The display will go back to the Special features menu (Figure 78).
10. Press the LEFT (◀) button three times to return to the rolling status screens.

SEND E.A.S.E. MESSAGE

With E.A.S.E. (Electronic Automated Service Evaluation), a homeowner or service technician can transmit operational data via a telephone for diagnostic purposes. Ask your participating EcoWater Systems dealer for more information.

To send an E.A.S.E. message:

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **Advanced settings** is highlighted.
3. Press the SELECT (○) button to display the Advanced settings menu (See Figure 80).

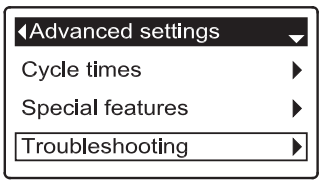


FIG. 80

4. Press the DOWN (▼) button to scroll through the menu options until **Troubleshooting** is highlighted.
5. Press the SELECT (○) button to display the Troubleshooting menu (See Figure 81).

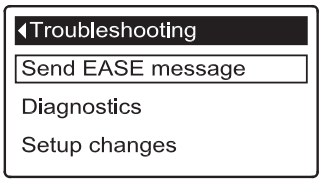


FIG. 81

6. Make sure **Send EASE message** is highlighted.
7. With the phone ready, press the SELECT (○) button to display the Send EASE message screen and begin transmission.
8. Hold the phone’s receiver an inch or two above the E.A.S.E. port on the softener’s faceplate (See Figure 7 on Page 8). Maintain the receiver steadily in this position during the entire transmission.

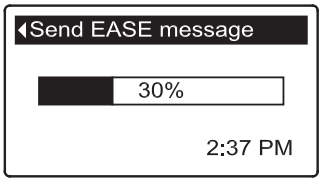


FIG. 82

9. A bar is displayed showing the transmission’s progress (See Figure 82). Once completed, the Troubleshooting screen immediately reappears (Figure 81).
10. Press the LEFT (◀) button three times to return to the rolling status screens.

DIAGNOSTICS

This feature allows a service technician to check the operating state of individual components in the softener (e.g. valve position) to troubleshoot problems. **If an error code is displayed in place of the rolling status screens, call your dealer for service.**

To view the Diagnostics screen:

1. If an error code is displayed, skip Steps 2-7 and go directly to Step 8.
2. To display the Diagnostics screen from any of the rolling status screens (when an error code is not displayed), press the SELECT (○) button to display the **Main menu**.
3. Press the DOWN (▼) button to scroll through the menu options until **Advanced settings** is highlighted.
4. Press the SELECT (○) button to display the Advanced settings menu.
5. Press the DOWN (▼) button to scroll through the menu options until **Troubleshooting** is highlighted.
6. Press the SELECT (○) button to display the Troubleshooting menu (See Figure 83).

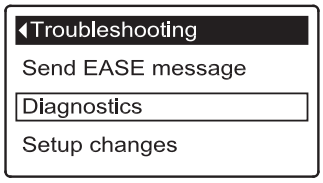


FIG. 83

7. Press the DOWN (▼) button to scroll through the menu options until **Diagnostics** is highlighted.
8. Press the SELECT (○) button to display the Diagnostics screen (See Figure 84).

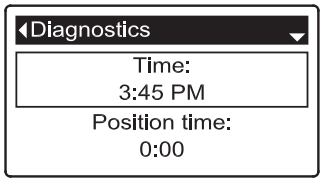


FIG. 84

9. Press the DOWN (▼) or UP (▲) buttons to scroll through the list. The following items are displayed:
   - **Time** (current)
   - **Position time** (counts down the time remaining in the current valve position)
   - **Current position** (of the valve: service, fill, brine, backwash, fast rinse or moving)
   - **Requested position** (of the valve)
   - **Motor state** (on or off)
   - **Valve position switch** (open or closed)
   - **Turbine count** (if changing, indicates water flow)
   - **Tank light switch** (open or closed)
   - **RF module** (detected or not)
   - **Error code** (call for service if a number is displayed)

continued

10. When finished viewing the Diagnostics screen, press the SELECT (○) button. The display will go back to the Troubleshooting menu.
11. Press the LEFT (◀) button three times to return to the rolling status screens (or error code screen if an error condition exists).

SETUP CHANGES

This feature allows a service technician to repeat the setup procedure (See Page 8) or restore the softener's default operating values.

1. From any of the rolling status screens, press the SELECT (○) button to display the **Main menu**.
2. Press the DOWN (▼) button to scroll through the menu options until **Advanced settings** is highlighted.
3. Press the SELECT (○) button to display the Advanced settings menu.
4. Press the DOWN (▼) button to scroll through the menu options until **Troubleshooting** is highlighted.
5. Press the SELECT (○) button to display the Troubleshooting menu (See Figure 83).
6. Press the DOWN (▼) button to scroll through the menu options until **Setup changes** is highlighted.
7. Press the SELECT (○) button to display the Setup changes menu (See Figure 85).

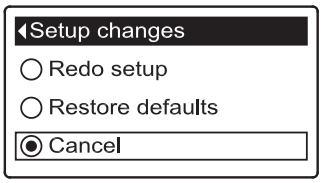


FIG. 85

8. If the desired option already has a black dot next to it (See Figure 85), go to Step 9. Otherwise, press the DOWN (▼) or UP (▲) buttons to scroll to the desired option, then press SELECT (○) to choose it.
   - **Redo setup** allows you to select a different model code (intended to be used for upgrades or retrofits of existing softeners). Model codes are listed on Page 29.
   - **Restore defaults** will reset all customizable settings to their default values and take you through the "wizard" screen setup procedure (See Page 7).
   - **Cancel** will return to the Troubleshooting menu (Figure 83).
9. Press the SELECT (○) button.

REFILLING WITH SALT

If the conditioner uses all the salt before more is added, hard water will result. Lift the brine tank lid and check the salt level frequently. The remote can also be used to monitor salt. It has an optional display, on the softener status screen, of the estimated number of days until salt is depleted ("Out of salt in X days"). The softener can also be programmed to display a Low Salt Alarm a certain number of days before salt is estimated to run out (See Page 10).

Be sure that the brinewell cover is on when adding salt. After adding and leveling salt, always set the salt level on the electronic controller, as described on Page 10.

NOTE: In humid areas it is best to keep the salt level less than half full and refill more often.

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

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

SALT WITH IRON REMOVING ADDITIVE: Some salts have an additive to help a water conditioner handle iron in the water supply. Although this 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 electronic parts. Iron Out salt is safe to use on two-tank models.

BREAKING A SALT BRIDGE

Sometimes a hard crust or salt "bridge" forms in the brine tank. This 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 recharged and hard water will result.

If the storage tank is full of salt, it is difficult to tell whether there is a salt bridge. A bridge may be underneath loose salt. The following is the best way to check for a salt bridge:

Salt should be loose all the way to the bottom of the tank. Hold a broom handle, or like tool, up to the softener, as shown in Figure 128. Make a pencil mark on the handle 5 cm below the top of the rim. Then, carefully push it straight down into the salt. If a hard object is felt before the pencil mark is even with the top, it is most likely a salt bridge. Carefully push into the bridge in several places to break it. **Do not try to break the salt bridge by pounding on the outside of the salt tank. You may damage the tank.**

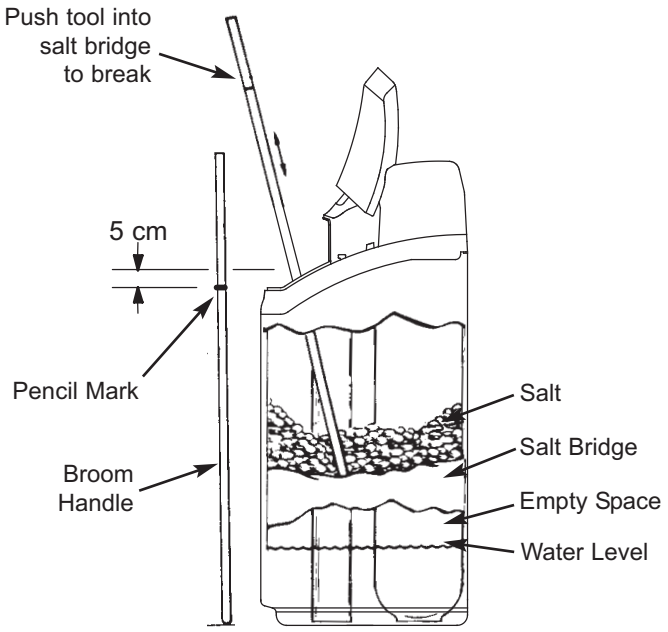


FIG. 128

CLEANING THE NOZZLE & VENTURI

A clean nozzle & venturi (See Figure 129) is necessary for the EcoWater Systems conditioner to work properly. This small unit creates the suction to move brine from the brine tank into the resin tank. If it should become plugged with dirt, silt, sand, etc., the EcoWater Systems conditioner will not work and hard water will result.

To get access to the nozzle & venturi, remove the conditioner's top cover. Put the bypass valve(s) into the bypass position. Be sure the conditioner is in the service cycle (no water pressure at the nozzle & venturi). Then, holding the nozzle & venturi housing with one hand, turn the cap to remove it. Do not lose the o-ring seal. Lift out the screen support and screen. Then, remove the nozzle & 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 & 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 put in place. Install and tighten the cap, by hand only. Do not overtighten, which could break the cap or housing. Put the bypass valve(s) into service (soft water) position.

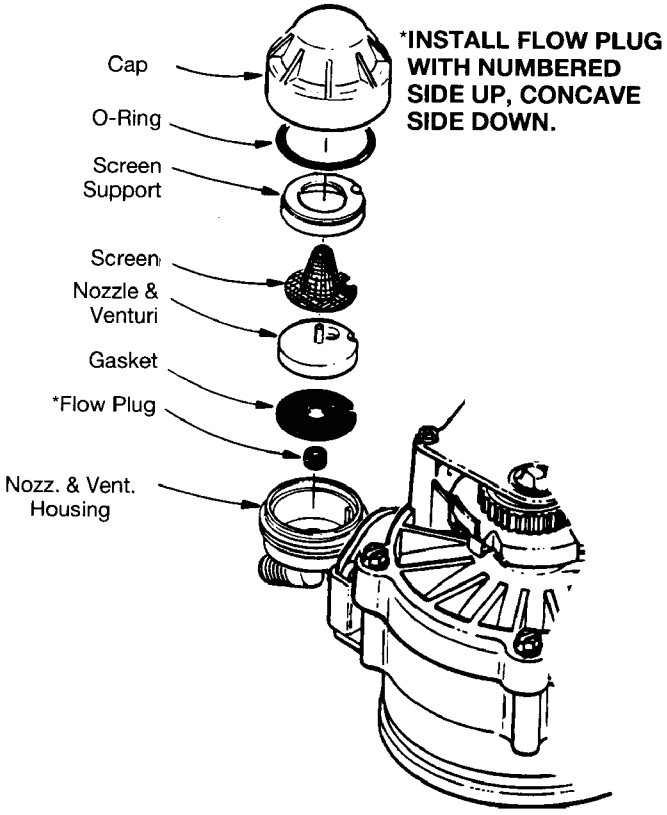


FIG. 129

RESIN BED CLEANING

If the water supply contains clear water iron, 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 six months, or more often if iron appears in the conditioned water supply.

RELIEVING WATER PRESSURE WITH THE BYPASS VALVE(S)

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

DE-PRESSURIZE

1. Put bypass valve(s) into **Bypass** position.
2. Place softener valve in **Fill** position by performing Steps 1 & 8 of Manual Advance Recharge procedure on Page 26.

PRESSURIZE

1. Put bypass valve(s) into **Service** position.
2. Return softener valve to **Service** position by performing Steps 11-17 of Manual Advance Recharge procedure on Page 26.

ALTERNATE METHODS:

3-VALVE BYPASS (See Figure 130)

DE-PRESSURIZE

1. Close the INLET valve.
2. Open HOT and COLD conditioned water house faucets.
3. Close the OUTLET valve and open the BYPASS valve.
4. Close all house faucets.

PRESSURIZE

1. Open HOT and COLD house faucets.
2. Close the BYPASS valve and open the OUTLET valve.
3. **Slowly**, open the INLET valve.
4. Close all house faucets.

ECOWATER SYSTEMS BYPASS VALVE

(See Figure 131)

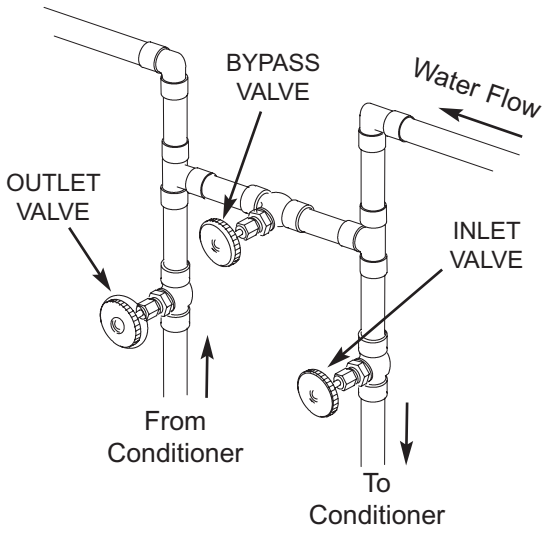
DE-PRESSURIZE

1. Close the house main water supply valve.
2. Open HOT and COLD conditioned water house faucets.
3. Push the bypass valve handle to **Bypass** position.
4. Optional: For hard water bypass to house faucets, reopen the main water supply valve.

PRESSURIZE

1. Open main water supply valve if it is closed.
2. Open HOT and COLD house faucets.
3. Pull the bypass valve handle to **Service** position.
4. Close all house faucets.

3-Valve Bypass



For **Service**
Close Bypass Valve.
Open Inlet & Outlet Valves.

For **Bypass**
Open Bypass Valve.
Close Inlet & Outlet Valves.

FIG. 130

EcoWater Systems Bypass Valve

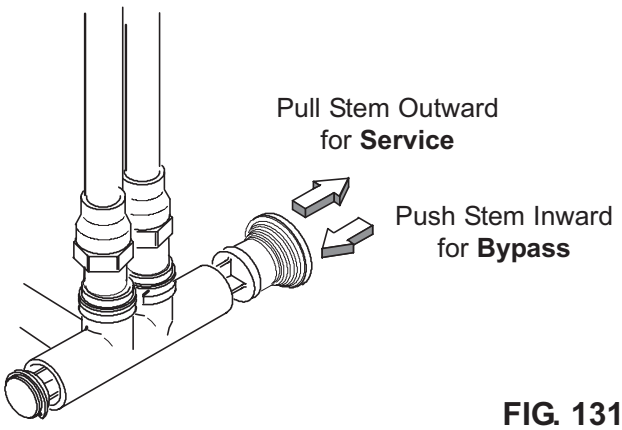


FIG. 131

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	CORRECTION
No soft water	No salt in the storage tank.	Add salt (See Page 21) and then initiate a "Recharge now," as shown on Page 11.
	Salt is "bridged."	Break salt bridge (See Page 21) and then initiate a "Recharge now," as shown on Page 11.
	If display is blank, transformer may be unplugged at wall outlet, power cable leads may be disconnected from the electronic control board, fuse may be blown, circuit breaker may be popped, or transformer may be plugged into a switched outlet which is "off."	Check for power loss due to any of these and correct. When power is restored, if the display shows the "Current Time" setting screen (Figure 33 on Page 11), it means time was lost during the outage. Set the current time. Other settings such as hardness are retained in memory during a power loss.
	Manual bypass valve(s) in bypass position.	Referring to Figure 6 on Page 5, place bypass valve(s) in service position.
	Dirty, plugged or damaged nozzle & venturi.	Take apart, clean and inspect the nozzle & venturi assembly, as shown on Page 22.
	Valve drain hose plugged or restricted.	Drain hose must not have any kinks, sharp bends, or be raised too high above the softener (See Page 3).
Water hard sometimes	Bypassed hard water being used during recharge, due to current time or recharge time settings being incorrect.	Check the current time displayed. If not correct, refer to "Set Current Time" on Page 11. Check the recharge time, as described on Page 12.
	Hardness number setting is too low.	Referring to "Setting Hardness" on Page 12, check the current hardness setting and increase if needed.
	Hot water being used when softener is recharging.	Avoid using hot water during recharges, because water heater refills with hard water.
	Increase in actual hardness of water supply.	Have unsoftened water sample tested. Referring to Page 12, check the current hardness setting and increase if needed.
	Turbine is not turning freely.	Check turbine, as described on Page 25.
Motor stalled or clicking	Motor malfunction or internal valve fault causing high torque on motor.	Contact your dealer for service.
Error code E1, E3 or E4 displayed.	Fault in wiring harness, connections to position switch, switch, valve or motor.	Contact your dealer for service.
Error code E5 displayed.	Electronic control malfunction.	Contact your dealer for service.

TROUBLESHOOTING - INITIAL CHECKS

Always make these initial checks first:

1. Is display blank? Check power source.
2. Is Error code displayed? If so, go to "Automatic Electronic Diagnostics" on the next page.
3. Is correct time displayed? If not, recharges occur at the wrong time. Set current time (See Page 11.)
4. Is there salt in the brine tank? If not, refill.
5. Is salt "bridged" (See Page 21)?
6. Are plumbing bypass valve(s) in service position (See Figure 6 on Page 5)?
7. Are inlet and outlet pipes connected to the EcoWater Systems conditioner inlet and outlet respectively?
8. Is valve drain hose free of kinks and sharp bends, and not elevated over 2 meters above the floor.
9. Is the brine tube connected (See Fig. 5 on Page 5)?
10. Check the hardness setting (See "Setting Hardness on Page12). Be sure it is correct for the household's water supply. Perform a hardness test on a raw water sample to compare with the setting.
11. Perform a hardness test on a conditioned water sample to determine whether a problem exists.

If no problem is found after making the initial checks, proceed to "Troubleshooting - Manual Diagnostics" and "Manual Advance Recharge Check" on the next two pages.

AUTOMATIC ELECTRONIC DIAGNOSTICS

This conditioner has a self-diagnostic function for the electrical system (except for input power and/or water meter). The controller monitors electronic components and circuits for correct operation. If a malfunction occurs, an **Error code** is displayed (See Figure 132).

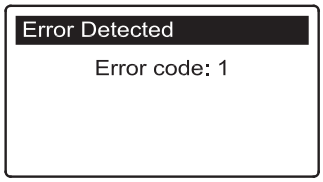


FIG. 132

The troubleshooting chart on the previous page shows the error codes that could appear, and the possible malfunctions for these codes.

When an error code appears in the display, pressing SELECT (○) will display the **Diagnostics** screen (See Page 20), so a service technician can further isolate the problem.

REMOVING ERROR CODE

1. Unplug transformer from electrical outlet.
2. Correct problem.
3. Plug in transformer.
4. Wait for eight minutes while controller operates valve through an entire cycle. The error code will return if the problem was not corrected.

TROUBLESHOOTING - MANUAL DIAGNOSTICS

1. Display the **Diagnostics** screen, following the procedure on Page 20.
2. Press the DOWN (▼) or UP (▲) buttons to scroll through the list. The following items are displayed:
   - **Time** (current)
   - **Position time** (counts down the time remaining in the current valve position)
   - **Current position** (of the valve: service, fill, brine, backwash, fast rinse or moving) See "Manual Advance Recharge Check" on next page for position verification.
   - **Requested position** (of the valve)
   - **Motor state** (on or off)
   - **Valve position switch** (open or closed)
   - **Turbine count** (indicates water flow) See following section for turbine diagnostics.
   - **Tank light switch** (open or closed)
   - **RF module** (detected or not)
   - **Error code**

CHECKING THE TURBINE

1. Display the **Diagnostics** screen, following the procedure on Page 20.
2. Press the DOWN (▼) button to scroll through the list until **Turbine Count** is displayed (See Figure 133).

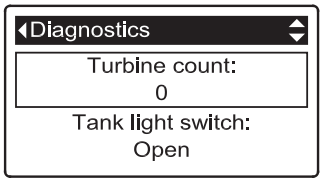


FIG. 133

3. A steady display of "0" (zero) indicates no water flow through the meter (i.e. no conditioned water being used).
4. Open a nearby conditioned water faucet.
5. The number in the display should count upward from 0 and reset for each gallon of flow (at 200 on some models, for example). (1 gallon = 3.78 liters)
6. If the display reading does not change with the faucet open, pull the wire harness from the valve outlet port (See Figure 134).

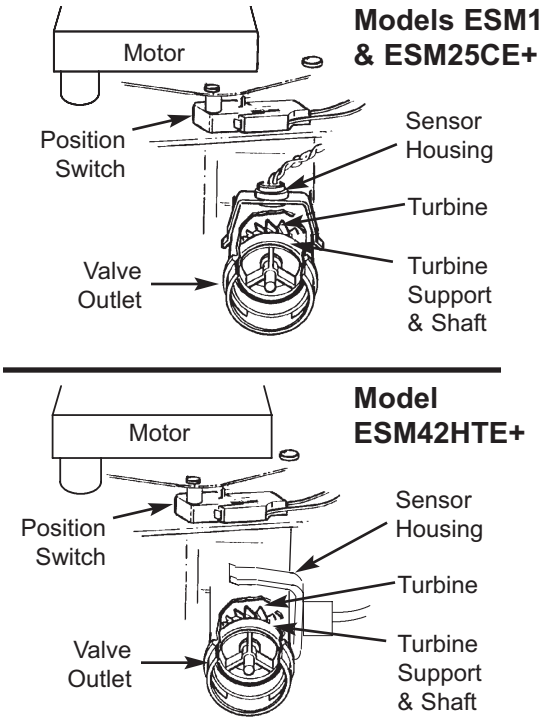


FIG. 134

7. Pass a small magnet back and forth in front of the sensor.

8a. If the displayed **Turbine Count** does count upward with each pass of the magnet, disconnect the outlet plumbing and check the turbine for binding.

8b. If the displayed **Turbine Count** does not count upward with each pass of the magnet, the sensor is probably faulty.

TROUBLESHOOTING - MANUAL ADVANCE RECHARGE CHECK

This check verifies proper operation of the position switch, gear motor, brine tank fill, brine draw, recharge flow rates, and other controller functions. Always make the Initial Checks (See Page 24) and the Manual Diagnostics (See Page 25) first.

1. Display the **Diagnostics** screen, following the procedure on Page 20.

2. Press the DOWN (▾) button to scroll through the list until **Valve position switch** is displayed (See Figure 135).

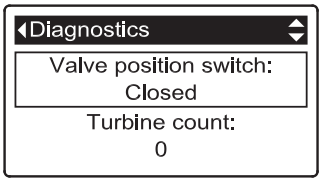


FIG. 135

3. Verify that when the switch plunger is down (into one of the detents on the valve motor cam), this screen reads **Open**. When the valve cam is rotating (for example, after Step 8, below) , the switch plunger will be up and this screen should read **Closed**.

4. Press the UP (▴) button to scroll through the list until **Current position** is displayed (See Figure 136).

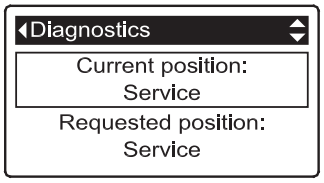


FIG. 136

6. Verify that the valve position indicator on the motor cam agrees with the position displayed on the screen

7. Remove the brinewell cover.

8. With the Diagnostics screen displayed, press the RIGHT (▸) button once to advance the valve from **Service** to **Fill**.

9. Shine a flashlight into the brinewell and observe fill water entering the tank.

10. If water does not enter the tank, look for an obstructed nozzle / venturi, fill flow plug or brine tube (See Figure 129 on Page 32).

11. After verifying fill, press the RIGHT (▸) button once to move the valve into **Brine*** A slow flow of water to the drain will begin. Verify brine draw from the brine tank by shining the flashlight into the brinewell to observe a noticeable drop in the liquid level.

* If the 2nd Backwash option is set (See Page 16), the valve will enter backwash and fast rinse before brine.

12. If the unit does not draw brine, check for:

- Dirty or defective nozzle / venturi (See Page 22)
- Nozzle / venturi not seated on the gasket or gasket not sealing properly
- Restriction in valve drain, causing back pressure (bends, kinks, elevated too high, etc.)
- Obstruction in valve or brine tubing
- Internal valve fault (obstructed outlet disc, wave washer faulty etc.)

13. With the Diagnostics screen displayed, once again press the RIGHT (▸) button to advance the valve to **Backwash**.

14. Look for a fast flow of water from the drain hose. If flow is slow, check for a plugged top distributor, backwash flow plug or drain hose

15. With the Diagnostics screen displayed, once again press the RIGHT (▸) button to advance the valve to **Fast rinse**.

16. Again, look for a fast flow of water from the drain hose. Allow the unit to rinse for several minutes to flush out any brine that may remain from the brine cycle test.

17. With the Diagnostics screen displayed, once again press the RIGHT (▸) button to return the valve to the **Service** position.

IMPORTANT: Always return the valve to the **Service** position before exiting this procedure.

OTHER SERVICE

Hard Water Bypass (Hard water “bleeds” into conditioned water supply):

1. Faulty inlet disc, seal or wave washer (See Pages 30 to 35).
2. Missing or faulty o-ring(s) at valve connection to riser pipe.

Water Leaks from Drain Hose during service:

1. Faulty inlet disc, seal or wave washer.
2. Faulty o-ring on inlet disc shaft.
3. Faulty outlet disc, seal or wave washer.

Flooded Salt Tank:

1. Nozzle / venturi plugged.
2. Faulty 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 well pump.
2. Partially restricted valve drain hose, top distributor, backwash flow plug, resin tank internal riser pipe, or bottom distributor.
3. Backwash and fast rinse times have been reduced from default settings.
4. Wrong model code.

WIRING SCHEMATIC

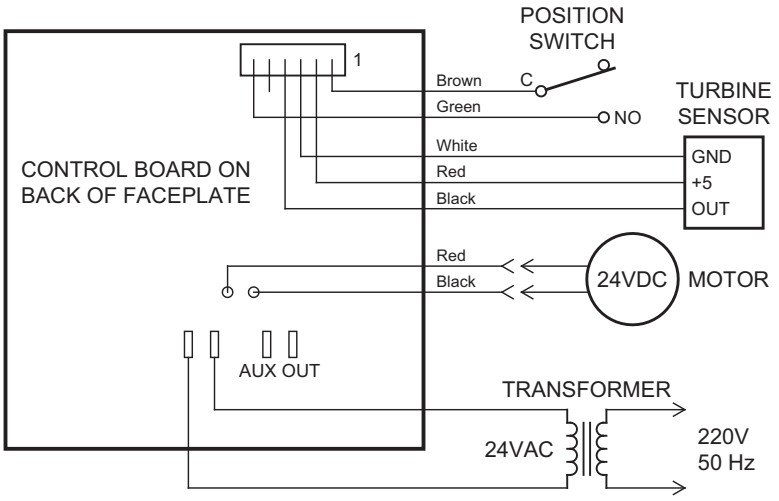


FIG. 137

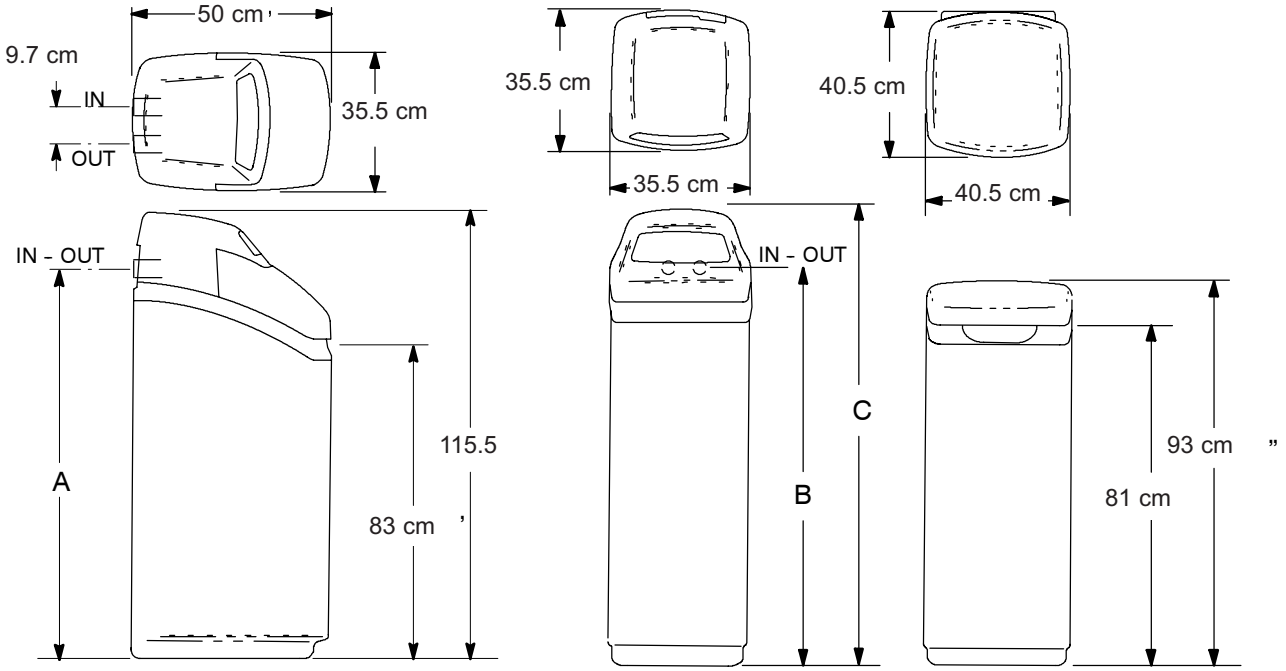
For future reference, enter the following information:

Model No. _____ **Serial No.** _____

Date Code _____ **Installation Date** _____

Water Hardness _____ **GPG or °d** **Iron Content** _____ **PPM.**

Model No. and Serial No. are on the shipping carton and on the rating decal on the conditioner. Date Code is on the shipping carton only.

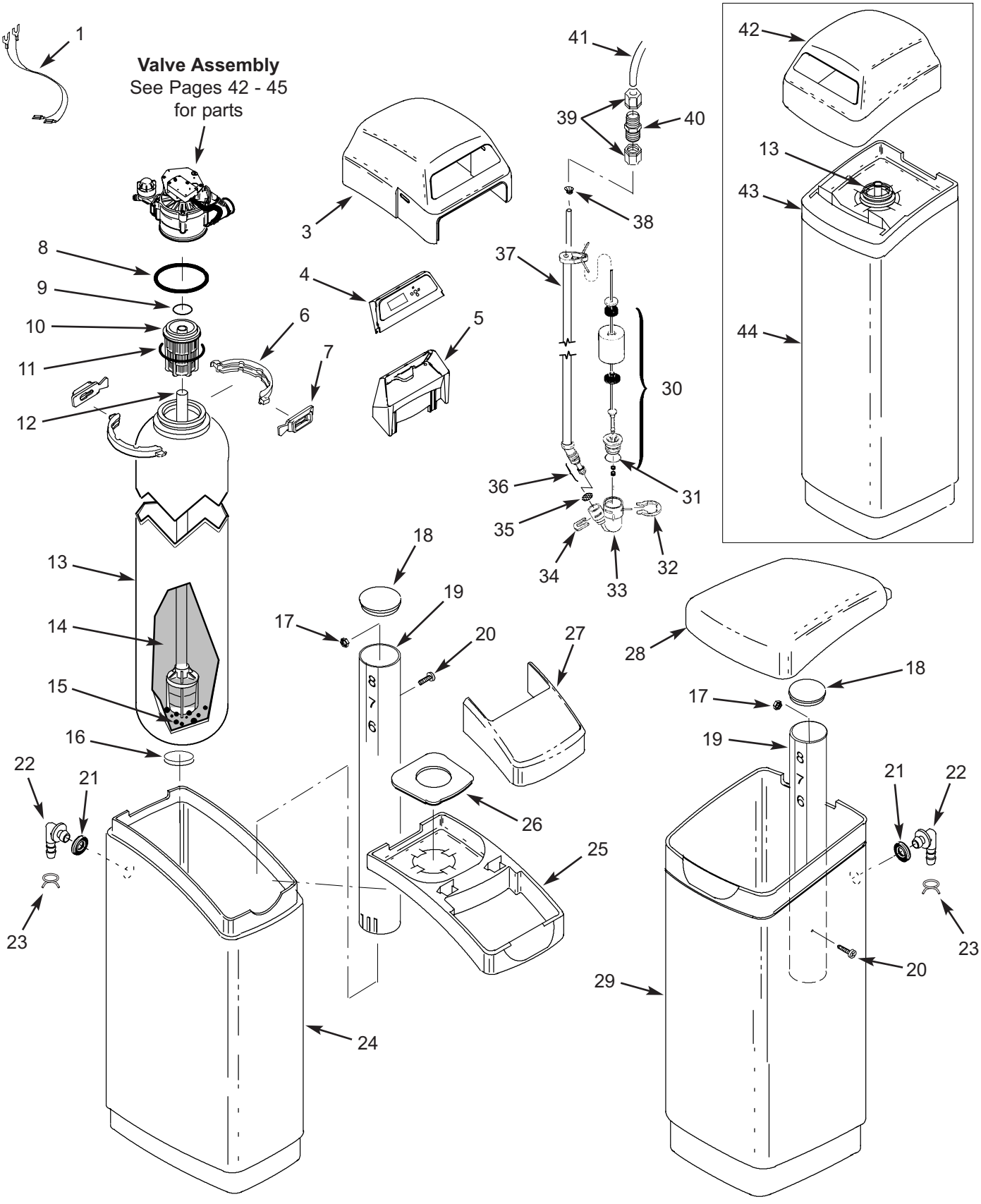


Cabinet Models **Two-Tank Models** **FIG. 138**

Model	Nominal Resin Tank Size	Dimension A(cm)	Dimension B (cm)	Dimension C(cm)	Salt Storage Capacity (Kg)
ESM18CE+	8” Dia. x 35”	100	–	–	100
ESM25CE+	10” Dia. x 35”	100	–	–	90
ESM42HTE+	10” Dia. x 47”	–	130	144	135

	ESM18CE+	ESM25CE+	ESM42HTE+
Model Code	E-17	E-25	E-42
Rated Softening Capacity (°Fm³ @ Kg. Salt Dose)	49 @ 0.86 103.5 @ 2.7 123 @ 4.5	68.5 @ 1.2 146 @ 3.8 175 @ 6.3	174.5 @ 1.1 195 @ 4.0 262 @ 6.9
Rated Efficiency (°F./Kg. of Salt at Min. Salt Dose)	57.1	57.8	68.5
Service Flow Rate (L/min)	30.3	36	34
Pressure Drop at Service Flow Rate (Bar)	0.82	0.9	0.55
Intermittent Flow Rate (L/min)) @ 1bar	34.5	38.6	51.9
Intermittent Flow Rate (gpm) @ 2 bar	53.7	57.9	81.4
Amount of High Capacity Resin (Liters)	17.5	24.9	31.7
Water Supply Max. Hardness °F (°d)	69 (40)	100 (58)	124 (72)
Water Supply Max. Clear Water Iron (ppm)	5	8	10
Min.-Max. Working Pressure (bar)	1.4 - 8.6		
Min.-Max. Operating Temperature (°C)	4 - 49		
Min. Water Supply Flow Rate (L/min)	11		
Max. Flow Rate (L/min) to Drain during Recharge	8.4	8.4	7.6

ECOWATER SYSTEMS CONDITIONER ASSEMBLY



ECOWATER SYSTEMS CONDITIONER ASSEMBLY

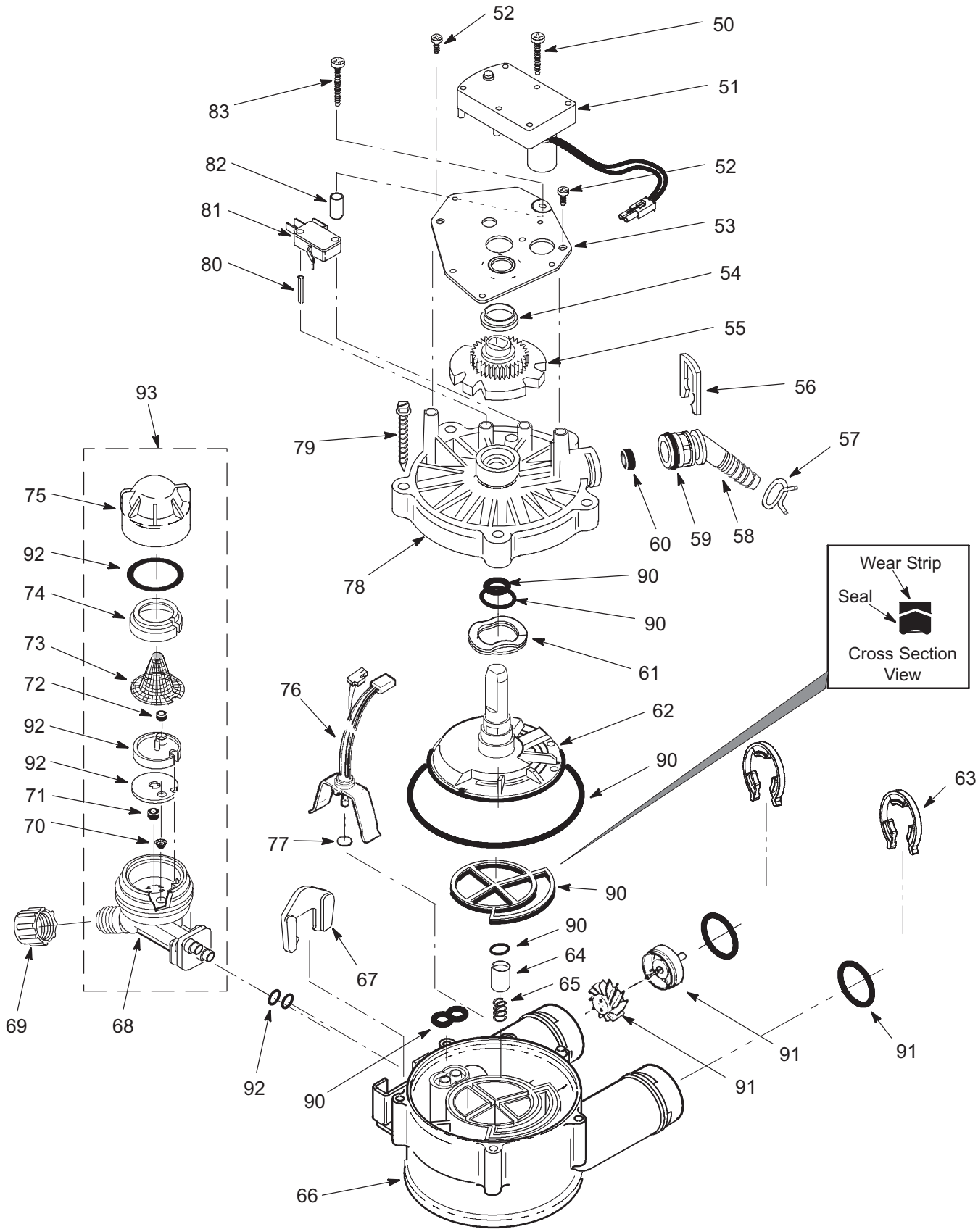
Key No.	Part No.	Description
1	7250826	Power Cable
2		
3	7218662	Repl. Top Cover (cabinet models)
4	7295258	Repl. Faceplate Assembly, incl. decal & electronic control
5	7291343	Support, Faceplate w/lens
6	7176292	Clamp Section (2 req.)
7	7088033	Retainer, Clamp (2 req.)
8	7133529	O-Ring, 2-7/8” x 3-1/4”
9	7133480	O-Ring, 13/16” x 1-1/16”
10	7077870	Top Distributor
11	7133503	O-Ring, 2-3/4” x 3”
12	7105047	Repl. Bottom Distributor
13	7114787	Resin Tank, 8” dia. x 35”
	7113066	Resin Tank, 10” dia. x 35”
	7092202	Resin Tank, 10” dia. x 47”
14	30437	Resin, 25 Liters bag
15	WSM001	Gravel per Kg (8 Kg needed)
16	1184700	Spacer (ESM18CE+ only)
17	7219595	Washer
18	7219888	Brinewell Cover
19	7109871	Brinewell Assembly w/decal
20	7219587	Screw
21	9003500	Grommet
22	1103200	Adaptor, Drain Hose
23	7112882	Hose Clamp
24	7218604	Repl. Brine Tank (cabinet models)
25	7287386	Rim (cabinet models)
26	7214244	Vapor Barrier
27	7291466	Salt Hole Cover Assembly
28	7274008	Cover, Brine Tank (two-tank models)
29	7218612	Repl. Brine Tank (two-tank models)

Key No.	Part No.	Description
30	7221754	Float, Stem & Guide Assembly
31	7170288	O-Ring, 15/16” x 1-3/16”
32	1205500	Clip
33	7092252	Brine Valve Body
34	7080653	Clip
35	7131365	Screen
36	7113016	Repl. Tubing Assembly, B.V.
37	7221746	Brine Tube
38	7171349	Cone Screen
39	9003201	Nut-Ferrule (2 req.) ✱
40	7094987	Union Connector ✱
41	7161768	Tubing, rol of 30 meters. ✱
42	7218670	Repl. Top Cover (two-tank models)
43	7274286	Rim (two-tank models)
44	7218646	Repl. Tank Sleeve (two-tank mod.)
■	7220928	Brine Valve Assembly, incl. Key Nos. 30 through 38
■	7108118	Drain Hose, 1/2” I.D.

■ Not illustrated

✱ Optional parts, not included with softener

3/4" DC VALVE ASSEMBLY (Models ESM18CE+ & ESM25CE+)



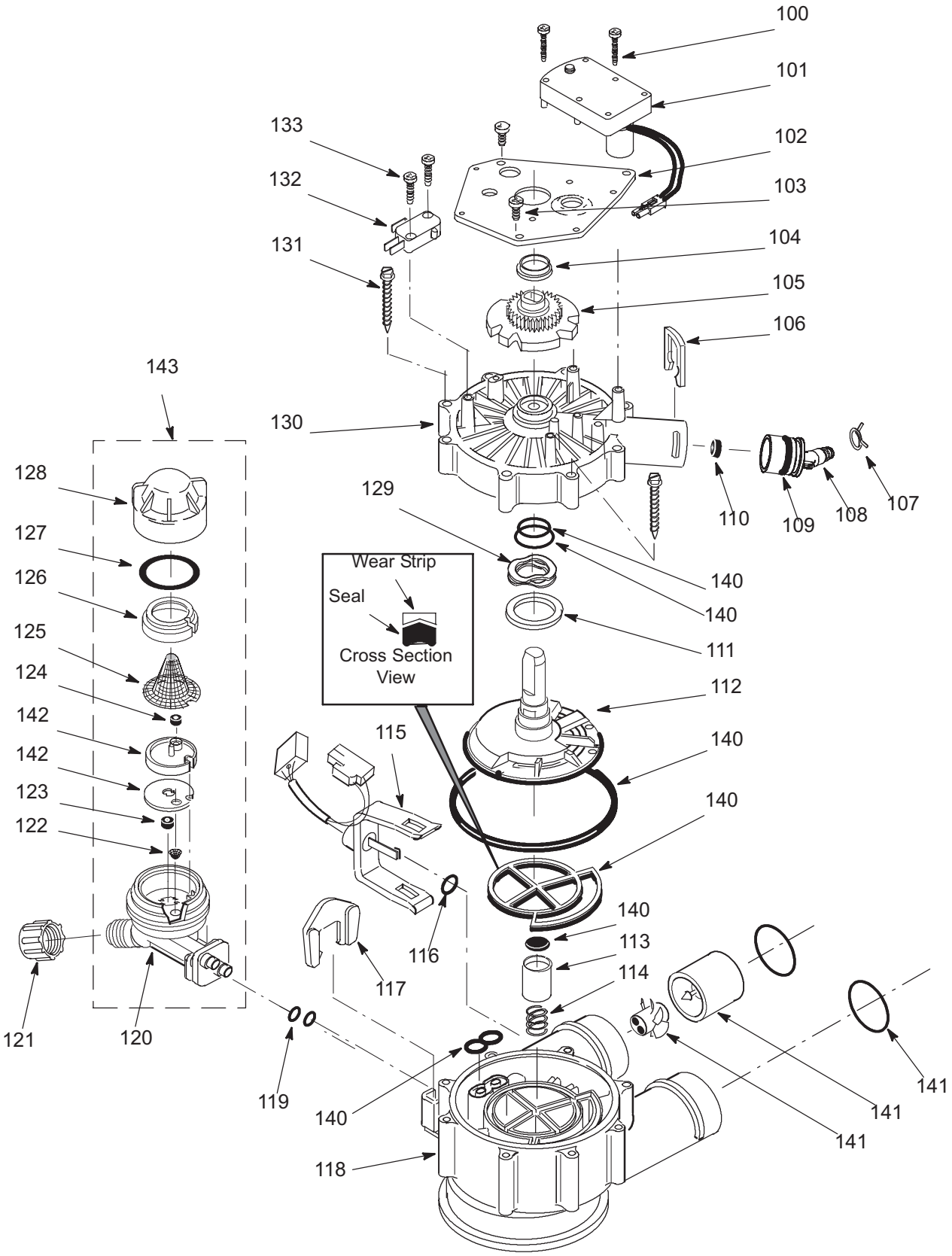
3/4” DC VALVE ASSEMBLY
(Models ESM18CE+ & ESM25CE+)

Key No.	Part No.	Description
50	7224087	Screw, #8-32 x 1” (2 req.)
51	7286039	Repl. Motor (incl. 2 ea. of Key No. 1)
52	0900857	Screw, #6-20 x 3/8” (2 req.)
53	7231385	Motor Plate
54	0503288	Bearing
55	7284964	Cam & Gear
56	7142942	Clip, Drain
57	0900431	Hose Clamp ✱
58	7024160	Drain Hose Adaptor
59	7170327	O-Ring, 5/8” x 13/16”
60	0501228	Flow Plug (Model ESM18CE+)
	7092618	Flow Plug (Model ESM25CE+)
61	7082087	Wave Washer
62	7199232	Repl. Rotor & Disc
63	7116713	Clip (2 req.) ✱
64	7092642	Plug, Drain Seal
65	7129889	Spring
66	7082053	Valve Body
67	7081201	Retainer, Nozzle & Venturi
68	7081104	Housing, Nozzle & Venturi
69	1202600	Nut-Ferrule
70	7095030	Cone Screen
71	1148800	Flow Plug, .3 gpm
72	0521829	Flow Plug, .1 gpm
73	7146043	Screen
74	7167659	Screen Support
75	7199729	Cap

Key No.	Part No.	Description
76	7276076	Wire Harness, Position Switch
77	0900060	O-Ring, 3/8” x 1/2”
78	7085263	Valve Cover
79	7074123	Screw, #10-14 x 2” (5 req.)
80	7077472	Expansion Pin
81	7030713	Switch
82	7117816	Spacer
83	7070412	Screw, #4-24 x 1-1/8”, flat head
90	7290949	Seal Kit, includes the following:
	-	O-Ring, 7/16” x 5/8”
	-	O-Ring, 3/4” x 15/16”
	-	O-Ring, 3-3/8” x 3-5/8”
	-	Repl. Rotor Seal
	-	O-Ring, 3/8” x 9/16”
	-	Seal, Nozzle & Venturi
91	7113040	Repl. Turbine & Support Kit, includes the following:
	-	O-Ring (2 req.) ✱
	-	Turbine Support & Shaft
	-	Turbine
92	7290957	Repl. Nozzle, Venturi & Gasket Kit, includes the following:
	-	O-Ring, 1/4” x 3/8”, (2 req.)
	-	Gasket, Nozzle & Venturi
	-	Disc, Nozzle & Venturi
	-	O-Ring, 1-1/8” x 1-3/8”
93	7187065	Nozzle & Venturi Assembly

✱ Included in parts bag

1" DC VALVE ASSEMBLY (Model ESM42HTE+)



1” DC VALVE ASSEMBLY
(Model ESM42HTE+)

Key No.	Part No.	Description
100	7224087	Screw, #8-32 x 1” (2 req.)
101	7286039	Repl. Motor (incl. 2 ea. of Key No. 1)
102	7231393	Motor Plate
103	0900857	Screw, #6-20 x 3/8” (3 req.)
104	7171250	Bearing
105	7283489	Cam & Gear
106	7169180	Clip, Drain
107	0900431	Hose Clamp ✱
108	7271270	Drain Hose Adaptor
109	7170288	O-Ring, 15/16” x 1-3/16”
110	0501228	Flow Plug
111	7174313	Bearing, Wave Washer
112	7185500	Repl. Rotor & Disc
113	7171187	Plug, Drain Seal
114	7129889	Spring
115	7276084	Wire Harness, Position Switch
116	0900060	O-Ring, 3/8” x 1/2”
117	7081201	Retainer, Nozzle & Venturi
118	7171145	Valve Body
119	7170319	O-Ring, 1/4” x 3/8” (2 req.)
120	7081104	Housing, Nozzle & Venturi
121	1202600	Nut-Ferrule
122	7095030	Cone Screen
123	1148800	Flow Plug, .3 gpm
124	0521829	Flow Plug, .1 gpm
125	7146043	Screen
126	7167659	Screen Support
127	7170262	O-Ring, 1-1/8” x 1-3/8”
128	7199729	Cap
129	7175199	Wave Washer
130	7171161	Valve Cover
131	7172997	Screw, #10 x 2-5/8” (8 req.)
132	7145186	Switch
133	7140738	Screw, #4-24 x 3/4” (2 req.)
140	7185487	Seal Kit, includes the following:
	-	O-Ring, 5/8” x 13/16”
	-	O-Ring, 1-1/8” x 1-1/2”
	-	O-Ring, 4-1/2” x 4-7/8”
	-	Repl. Rotor Seal
	-	Seal
	-	Seal, Nozzle & Venturi
141	7290931	Repl. Turbine & Support Kit, includes the following:
	-	O-Ring (2 req.) ✱
	-	Turbine Support
	-	Turbine
142	7114533	Repl. Nozzle, Venturi & Gasket Kit, includes the following:
	-	Gasket, Nozzle & Venturi
	-	Disc, Nozzle & Venturi
143	7187065	Nozzle & Venturi Assembly

✱ Included in parts bag

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