

## RAINFRESH EDSE WATER SOFTENERS.

### Installation & operation instructions

#### INTRODUCTION

Rainfresh EDSE series water softener utilizes ion exchange (cation exchange) technology to make water soft. It can be used on any water source (see table 1) and is not limited to municipally-treated sources.



When water containing hardness ions (Calcium ( $\text{Ca}^{++}$ ) and Magnesium ( $\text{Mg}^{++}$ )) enters the EDSE system, an instantaneous exchange of ions takes place. The Ca and Mg ions are attracted to the resin media inside the softener and an equivalent number of sodium ions are released into the water. Sodium ions do not form scale and therefore, the water is rendered soft. When the exchange capacity of the resin nears exhaustion, an automatic *backwash* and *regeneration* process is

initiated wherein the “trapped” calcium and magnesium ions are stripped away and dumped to drain and the resin is recharged with sodium again. Softener salt (sodium chloride) is the source for the sodium and you will need to add softener salt occasionally to make sure that ample sodium is available for regeneration.

PARAMETER	Raw Water MAXIMUM LIMIT
Iron	< 0.5 ppm
Manganese	< 0.05 ppm
Turbidity	1 NTU
Chlorine	< 0.2 ppm
Hydrogen Sulfide	Nil

Table 1

Note that the salt does not go into the water. It is only used to re-charge the softener resin and excess salt is flushed out to drain.

**Caution:** If you plan to drink soft water and are on a sodium-restricted diet, it is highly recommended that you consult your doctor or health professional prior to doing so. Otherwise, it is generally considered safe to drink soft water.

**Note:** Water softeners do not kill or remove bacteria or any other pathogenic microorganisms. To continuously disinfect all the water in your house, we recommend that you install a Rainfresh UV system. Call Rainfresh for details.

#### Electrical Requirements:

- The automatic control valve works on 110V AC. We recommend a GFI (ground fault interrupter) 120 volt outlet within 5 feet of the softener. Extension cords are not recommended.
- If water pipes are used to ground electrical system, you will need to install a jumper wire across the filter unit.

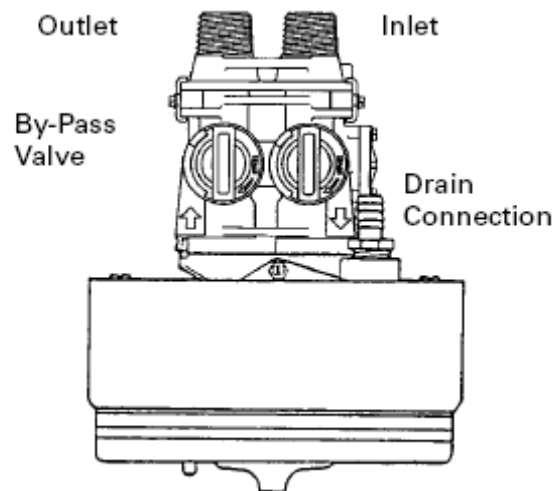
#### Unpacking the unit

The EDSE softening system includes:

- 1) The main softening resin tank with electronic metered automatic control valve.
- 2) Separate brine (salt) tank with brine valve
- 3) By-pass valve (3/4" or 1")
- 4) Drain Fitting (for 1/2" Hose)

Unpack the unit and place it at the location where you intend to install the unit.

- Stand back and look at the softener to make sure it is standing straight up and not tilted to one side. Make sure your chosen location will be fairly level, dry, and protected from possible freezing conditions. The softener can sit directly on the floor and will not corrode. DO NOT set the softener onto make shift platforms as this can damage the salt tank, or may cause it to topple.
- The system has an inlet, an outlet, a connection to the salt tank, and a drain line. If you are looking at the front of the unit, the inlet is on the right side. **Warning:** Make sure that you

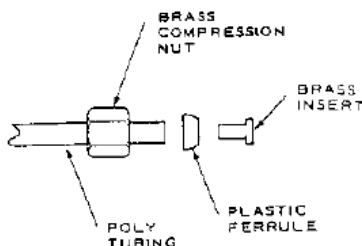
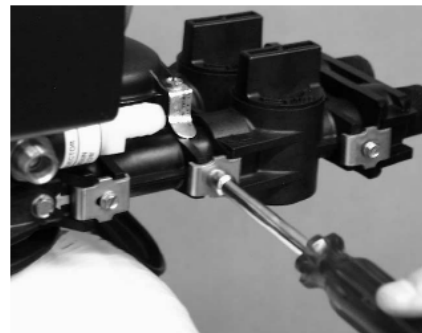


have correctly identified the inlet of the system. REVERSING THE CONNECTIONS WILL RESULT IN RESIN BEADS BEING THROWN INTO YOUR HOME'S PLUMBING SYSTEM CAUSING DAMAGE TO IT AS WELL AS THE SOFTENER.

- The following materials can be used for installing your new system, but remember to check your local plumbing codes. Copper, PVC, CPVC, and PEX are the most popular.
- Some prefer not to soften the water spigots that go outside used for irrigation or sprinkler systems. You will have to plan the job so that you cut in to feed the softener AFTER these spigots. Installing your softener after the pressure tank on a well water system is the preferred location. If you have a sand filter or cartridge filter or an iron filter, install the water softener after them.

### Plumbing in your softener

- If you have private well, turn the power off to the pump then shut off the main water shut off valve. If you have municipal water, simply shut off the main valve. Go to a faucet, (preferably on the lowest floor of the house) turn on the cold water until all pressure is relieved and the flow of water stops. If your hot water tank is electric, turn off the power to it to avoid damage to the element in the tank.
- Position the resin tank with control valve installed in the desired location. Try locating the softener to the left of a vertical main line. This way the inlet can be easily ran to the main line, then the outlet a few inches higher.
- Attach the yoke and by-pass valve as shown in picture.
- Plumb in the inlet and outlet of the softener.
- The system requires a 1/2" ID flexible plastic drain line running from the softener. There will be a fair amount of pressure on this flexible plastic drain line when the softener is in the regeneration mode, so make certain it is secured in place.
- Install the backwash line by applying Teflon tape on the drain fitting first. In some cases, the drain fitting may come pre-installed on the unit. The barbed fitting is made for 1/2" poly tubing which can be purchased by the foot at most well-stocked hardware stores. This can be ran up overhead or down along the floor. Use band clamps to hold the drain tubing in place on the fitting. If running drain line more than 30 feet overhead, increasing the line size to 3/4" will be required. Please follow your local health dept. Codes for where to run softener discharge water. NEVER MAKE A DIRECT CONNECTION INTO A WASTE WATER DRAIN. A PHYSICAL AIR GAP OF AT LEAST 3" SHOULD BE USED TO AVOID BACTERIA AND WASTEWATER TRAVELING BACK THROUGH THE DRAIN LINE INTO THE SOFTENER.
- Install the salt tank by using the 3/8" tubing (*provided*) and locating the brine valve that accepts the tubing on the control valve, and secure the tubing to the compression nut. The other end of the tubing goes through the small hole near the top of the salt tank. Remove the white cap on the 4" diameter brine well inside the salt tank. This should expose the safety float. Bring the end of the 3/8" tubing into the brine well and make the connection with the compression fitting on the safety float. The barbed elbow near the middle of the salt tank is for a "gravity" overflow line in case of a malfunction resulting in a salt tank overflow. This must be ran downhill if used. It uses the same size tubing as the drain line. DO NOT TEE THESE TWO TOGETHER.



- Inside the brine well, there is a float assembly rod. This is a safety overflow device that will shut off the water flow into the salt tank if the control head was to fail. The float should be adjusted to be around the middle of the tank. You want it to be at least half way up but below the overflow outlet. There are two rubber grommets on the rod that slide up and down to adjust the float with. Sometimes one of these will fall off in shipping and be at the bottom of the salt tank.



- You can now put water in your brine tank. To start with put 5 gallons of water in the brine tank. This is not a critical level but just helps with the process for the first regeneration. You can then add 1 or 2 bags of salt to start with.
- Turn the main valve on slightly all the time watching for leaks. Make sure a faucet is on somewhere and that any aerator is removed to avoid clogging from loosened scale in the pipes. Leave the bypass valve in the bypassed position and slowly turn the main shutoff valve on all the way. If you have no leaks, proceed to the next steps.
- Connect the control valve to the AC power source. Manually put the softener into the regeneration cycle by pressing the regeneration button. Turn the bypass valve slightly to allow water to run into the unit. You want water to initially fill the tank slowly. Once the tank is full of water, you can open valve fully. This prevents resin from being pushed up into the control head by the initial surge of water going in. Once the tank is full of water you should start to see water flowing from the drain line. It may look somewhat discolored at first. This is normal. Once the water runs clear and free from air pockets, turn the bypass valve further and further into the "service position". You should have a full flow to the drain at this point.
- You can add salt at this time to fill if not done already. The softener only uses 6 to 15 pound of salt at a time depending on the size of the system, so the tank doesn't have to be full at all times. We recommend any good quality salt pellets made for water softener usage. The tank *does not* have to be full in order to work properly.
- We recommend filling the tank, then letting the salt level drop to the point you see water in the bottom of the tank before filling again. This prevents bridging of the salt into a single rocky clump that is cumbersome to take out.
- Note: If Potassium chloride is used, the regeneration frequency should be increased by 20-30%.
- When resin is new, the water will be soft as soon as raw water flows through the tank so regeneration is not required unless you just want to observe the regeneration process.
- Details on the softener control valve are explained in the booklet enclosed with this unit.

Make sure to set the current time of day by pressing the up (Λ) or down (v) buttons on the control head. This allows the unit to wait until 2 am for backwash when you are not using water in the house.

Your water will be discolored for a day to two after initial installation. You can turn on a close faucet and let the water run for a couple hours to help clear up the water initially, but do not be alarmed by discolored water for a couple days or air in the water. Also even though you will have soft water right away, it will take a few days to get all the hard water out of your hot water tank. So you will experience some hard water from your hot water tank for a few days.

## System Specifications (Table 2)



Rainfresh Model	Capacity Grains	Max Flow Rate US GPM (LPM)	Max Flow to drain US GPM (LPM)	Media Tank size Dia x H (Inch)	Salt tank size Dia x H (Inch)	Inlet/Outlet connections	Shipping Weight lbs (Kg)
EDSE30	30,000	8 (30)	1.5 (5.5)	9" x 48"	21"x36"	¾" MPT	105 (48)
EDSE45	45,000	12 (45)	2.0 (7.5)	10" x 54"	21"x36"	¾" MPT	140 (64)
EDSE60	60,000	15 (56)	3.0 (11.3)	12" x 52"	21"x36"	1" MPT	185 (84)

### Calculate Regeneration frequency

The control valve is factory-set to regenerate after 833 US gallons of water have passed through it. To determine the regeneration frequency, calculate as follows.

- 1) Hardness concentration in your water = \_\_\_\_\_ ppm------(A)  
If you have the reading in grains per gallon, multiply the gpg concentration by 17.1 to get hardness in ppm (mg/L)
- 2) Enter iron concentration = \_\_\_\_\_ ppm -----(B)
- 3) Enter Manganese concentration = \_\_\_\_\_ ppm -----(C)
- 4) TOTAL calculated hardness (D) = [(A) + (4xB) + (8xC)] ÷ 17.1 grains
- 5) Find out (from table 2) the total capacity of your system and multiply this number by 0.2 for compensating regeneration efficiency. Divide this number by total calculated hardness (D) to get system capacity in gallons before regeneration is required.
- 6) Further multiply this number by 0.2 to compensate for other water conditions. This value should be the gallons of water you should set your softener for before regeneration is required.

Example:

Water has 171 ppm hardness, 0.5 ppm iron and 0.05 ppm manganese.

Total calculated hardness = [171+ 4 x(0.5) + 8 x (0.05)] ÷ 17.1 = 10.14 grains per gallon.

### Winterizing the system

If the unit is to be winterized, the best way is to close the by-pass valve and unscrew the 2 screws adjacent to the by-pass valves that hold the unit and the by-pass valve together, and carry the unit to a place where it will not be subject to freezing temperatures.



If, however, it is not possible to easily move the system, then there are two options.

Unscrew the control valve carefully by holding it with both hands and slowly rotating it anti-clockwise while holding the tank. The control valve is internally connected to a tube which should not come out with the valve. Therefore, when the control head is completely unscrewed, do not lift it up with force. Gently make screw in and out motions until the valve is high enough that you can hold on to the internal tube with one hand.

Now insert a 3/8" flexible tube into the tank to the top of the media and siphon off as much water as you can.

Option 1: Add a saturated brine solution to the tank. This will protect the tank from freezing up to -20°C (-4°F)

Option2: Add propylene glycol (antifreeze) to the tank.

In both cases, when re-starting operation, screw on the control valve back to the tank and connect the screws back on to the by-pass valve. Backwash the unit thoroughly at least twice in succession to make sure that it is now clean and ready to use.

## Troubleshooting

PROBLEM	CAUSE	SOLUTION
Softener fails to regenerate.	<ol style="list-style-type: none"> <li>1. Electricity interrupted to system</li> <li>2. Power failure.</li> </ol>	<p>Assure continuous current outlet, fuses ok, plug system in. Reset time of day.</p>
Softener is not softening.	<ol style="list-style-type: none"> <li>1. Bypass valve is in the bypass position.</li> <li>2. No salt in brine tank.</li> <li>3. Internal leak.</li> <li>4. Hot water is hard.</li> <li>5. System may not be regenerating often enough</li> </ol>	<ol style="list-style-type: none"> <li>1. Move bypass valve to service position.</li> <li>2. Add salt to brine tank above water level</li> <li>3. Replace seals, spacers, piston or distributor tube.</li> <li>4. Drain hot water tank and fill with soft water.</li> <li>5. Increase regeneration frequency.</li> </ol>
Unit uses too much salt.	<ol style="list-style-type: none"> <li>1. Excessive water in brine tank.</li> </ol>	<ol style="list-style-type: none"> <li>1. Brine draw not functioning. Clean injectors.</li> </ol>
Loss of water pressure.	<ol style="list-style-type: none"> <li>1. Iron build up in softener</li> <li>2. Inlet of control plugged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean control and add resin cleaner. Increase regeneration frequently.</li> <li>2. Remove piston and clean control of foreign material.</li> </ol>
Iron in conditioned water.	<ol style="list-style-type: none"> <li>1. Fouled resin bed.</li> </ol>	<ol style="list-style-type: none"> <li>1. Add resin cleaner, increase frequency of regeneration. May need to replace resin completely.</li> </ol>
Too much water in brine tank.	<ol style="list-style-type: none"> <li>1. Plugged drain line flow control.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean flow control. Put system into brine, rinse and draw until only 4" of water is left in bottom of brine tank.</li> </ol>
Softener fails to draw brine.	<ol style="list-style-type: none"> <li>1. Internal controls leak.</li> <li>2. Injectors plugged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change seals, spacers, or piston.</li> <li>2. Clean injectors.</li> </ol>
Drain flows continuously.	<ol style="list-style-type: none"> <li>1. Internal control leak.</li> <li>2. Timer motor stopped or jammed.</li> <li>3. Control valve jammed in brine or backwash position.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace seals, spacers or pistons.</li> <li>2. Replace timer motor.</li> <li>3. Replace seals, spacers or pistons.</li> </ol>



**Envirogard Products Limited**  
 446 Major Mackenzie Drive East,  
 Richmond Hill, ON L4C 1J2, CANADA  
 Toll Free: 1.800.667.8072, Tel: (905)884 9388 Fax:(905) 884 3532  
 E-Mail: [info@rainfresh.ca](mailto:info@rainfresh.ca). Web: [www.rainfresh.ca](http://www.rainfresh.ca)