

The following information is not intended to replace attending technical training programs or reading of installation instructions. It should be viewed as a general discussion about the product, its application, limitations and key factors to remember before purchase.

PURPOSE and CAPABILITIES: An ion exchange water softener is designed to remove (exchange) water hardness ions (calcium & magnesium) from water supplies using specialized softening resin as the catalyst and salt (sodium) as the regenerant. Water passes downwardly through the mineral bed where the ion exchange takes place. Softeners can easily remove upwards of 100 grains per gallon of hardness (depending upon the cubic foot capacity). They can also remove very high quantities (20 ppm+) of ferrous (clear water) iron and manganous (clear water) manganese. HOWEVER, making a softener work this hard may run you into problems of bed fouling and iron/manganese break-through. Additionally, the amount of salt required to regenerate resin where iron/manganese is concerned is four times that of hardness. Therefore, removing iron and manganese with a softener consumes a tremendous amount of salt and puts higher levels of sodium into the water. Standard cation exchange water softeners can also remove or reduce Aluminum, Copper {20%-90%}, Zinc, Radium, Barium, Beryllium, Cadmium, Chromium (+3), Lead {20%-90%}, Mercury (+2) {20%-90%}, Nickel and Thallium. **WARNING:** Although softeners can reduce the foregoing water constituents, do not make such claims regarding health-related contaminants. Attempting to handle such problems as those other than basic Hardness, Iron and Manganese requires special testing and equipment application. Always check with CSI before attempting anything other than standard applications!

TECHNICAL

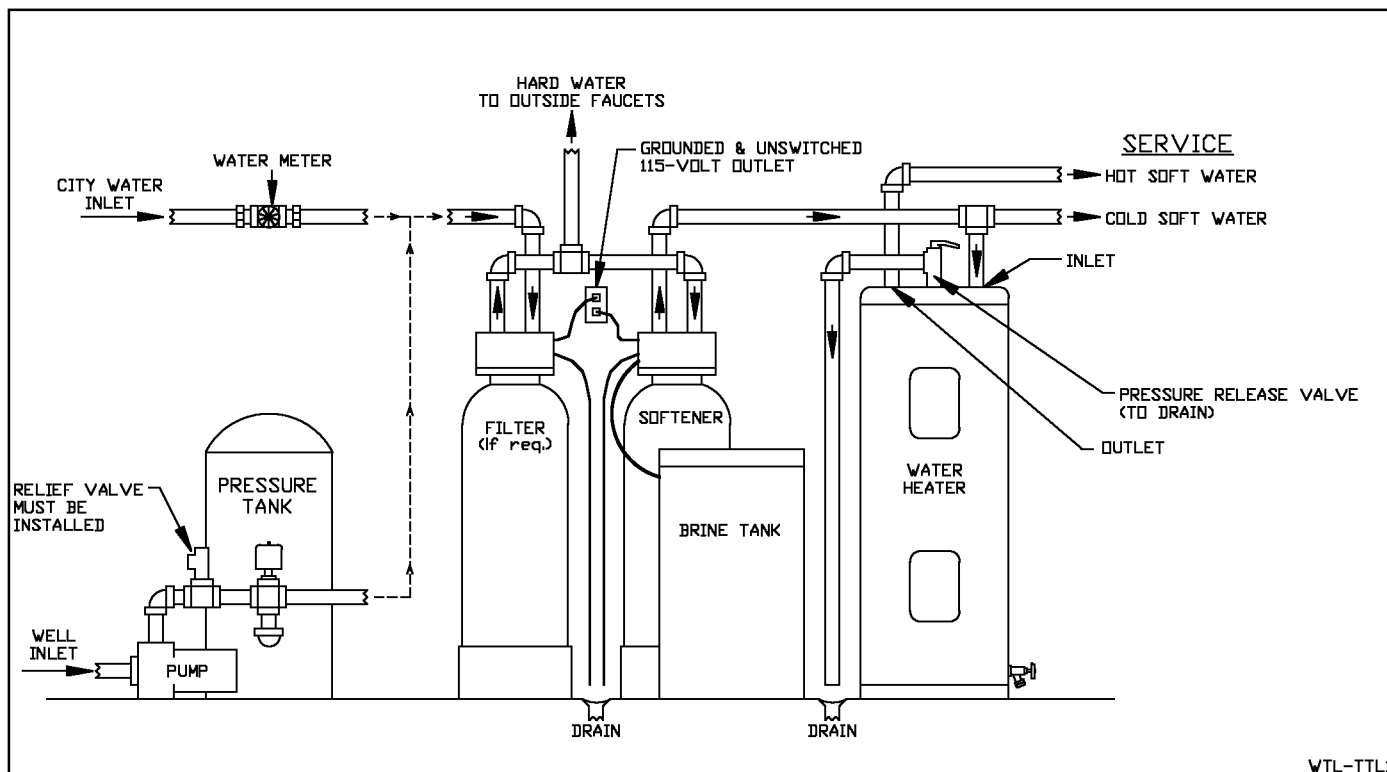
HARDNESS TABLE	
Soft	0 - 3.5 gpg
Moderately Hard	3.5 - 7.0 gpg
Hard	7.0 - 10.5 gpg
Very Hard	10.5+ gpg

NOTE: "gpg" means grains per gallon.

LIMITATIONS: Softeners cannot remove hydrogen sulfide, iron bacteria, tannins, foul tastes, odors & colors nor should they be used to remove anything other than very, very light sediment. Iron bacteria will eventually cause fouling and plugging of the bed. High levels of hydrogen sulfide and chlorine can damage the exchange capacity of the mineral beads. Various size units have different hardness, iron/manganese, service and backwash flow rates. Always consult the specification sheet in order to make a proper selection.

WATER TESTING: Always test the raw water supply for at least the following: 1) Hardness; 2) Iron; 3) Manganese; 4) pH; 5) Tannins; 6) Hydrogen Sulfide {if rotten egg odor is present}; and 7) Chlorine {if on treated water supply}. Consult specification sheet to check for limitations.

INSTALLATION: Softeners should be installed on a level surface; on cold water line only; after filtration equipment; after outside sillcock lines; and, before the piping splits to the water heater. Below is a diagram of a typical installation.



Never elevate the mineral tank more than 1-2 feet above the brine tank so as not to cause problems with brine draw. Avoid installations in direct sunlight and where freezing may occur. Locate the unit near a 115V, unswitched outlet (except manual units that require no electricity) and near a drain. Where the drain line must be elevated above the system or runs for more than 20 feet, increase the drain line size to 3/4". NEVER decrease the size of the drain line! It is advisable (and code in most areas) that there be at least a 4" air gap between the drain and drain line. Check all local codes before installing equipment.

PROGRAMMING THE SYSTEM: After all plumbing has been completed according to the installation instructions, find the section in the instructions regarding programming the control valve. It is quite simple but you must first consult your water test results. You have determined the amount of hardness, iron, manganese, etc. Remember that iron and manganese must have special consideration. To calculate "Compensated Hardness," add the total of iron and manganese together and multiply by four (4). Add this answer to the amount of hardness (in grains per gallon) to arrive at compensated hardness. Use this number when programming either a Timeclock or Demand initiated control valve. It is always advisable to both disinfect the unit and test the system cycles. Consult the installation instruction manual.

REGULAR MAINTENANCE: All that's necessary for normal softener maintenance is to keep good quality softener salt in the brine tank. Where iron/manganese are also being removed, it is a good idea to occasionally use either a resin cleaner (Res-Up) or a bag of salt that has rust inhibitor in the formulation. Some prefer to use this type of salt instead of standard salt. That's fine, but it is more costly. If iron bacteria has entered the system, you will need to put the system through one or more regenerations using 5.25% sodium hypochlorite (standard household bleach). Adding a cup of bleach to the brine tank prior to regenerating will usually suffice. Should the system become terribly fouled, it may be necessary to remove the control valve, empty the resin and wash the beads in a stronger solution. It is also a wise move to clean the brine tank about once per year.