

The following 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 Nitrate/Sulfate system is designed to remove (exchange) nitrate and sulphate ions from water supplies using a very specialized resin as the catalyst and salt (sodium) as the regenerant. Water passes downwardly through the mineral bed where the ion exchange takes place. These systems can easily remove these constituents (depending upon the cubic foot capacity). They are not designed to remove hardness, iron or manganese! As a matter of fact, the water should be pretreated (if necessary) so that certain other contaminants are not present in the water to be treated. If they are not removed, you may run into some problems of bed fouling and nitrate/sulphate breakthrough. The amount of salt (per cubic foot of resin) required to backwash these systems is actually less than that required to regenerate a softener of a similar size.

WARNING: Although these systems can reduce the foregoing water constituents, **YOU MUST** make certain that you take precautions for proper sizing, installation and water testing since these constituents (especially nitrates) can have serious health-related consequences!! Always check with CSI before attempting anything other than standard applications!

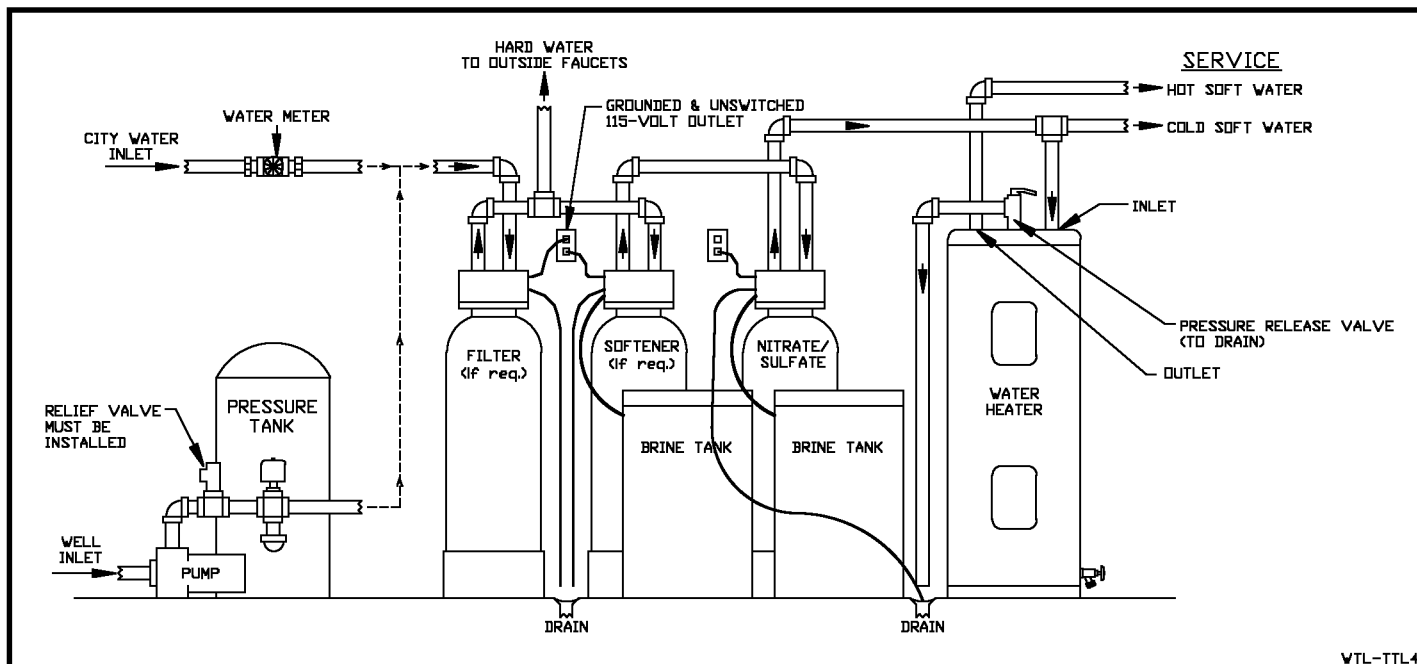
RAW WATER LIMITATIONS	
Free Chlorine	0.5 ppm
Turbidity	5 units
Iron	0.1 ppm
Manganese	0.1 ppm
Hydrogen Sulfide	0.1 ppm
Tannins	0.5 ppm
Hardness	Preferably less than 5 gpg

Note: "ppm" means parts per million - "gpg" means grains per gallon.

LIMITATIONS: Remember, Nitrate/Sulphate systems cannot remove hardness, iron, manganese, hydrogen sulfide, iron / manganese / sulfur bacteria, tannins, tastes, odors & colors nor should they be used to remove anything other than Nitrates and Sulphates. Presence of any of the above constituents can cause these systems to become less efficient or fail to remove nitrates and sulphates! Various size units have different 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); 7) Chlorine (if on treated water supply); 8) Nitrates as N (nitrogen); 9) Nitrates as NO₃ (nitrate); and 10) Sulphates as SO₄ (sulphate)

INSTALLATION: Nitrate / Sulphate systems should be installed on a level surface, on cold water line only; after filtration and softeners; after outside sillcock lines; and, before the piping splits to the water heater. Note 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 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. Refer to the "Capacity/Regeneration" box in order to determine the regeneration frequency for either Timeclock or Demand initiated control valves. Always check system cycles and consult the installation instruction manual.

REGULAR MAINTENANCE: All that's necessary for normal maintenance is to keep good quality softener salt in the brine tank. Should the system become fouled, it may be necessary to remove the control valve, empty the resin and wash the beads. It is also wise to clean the brine tank about once per year.

Capacity/Regeneration

In order to properly size Nitrate/Sulphate systems, the amounts of each in the raw water must be known. They must be expressed as equivalents as calcium carbonate (CaCO_3). Use the test results and follow these steps:

$$\text{Sulphate as } \text{SO}_4 \text{ ppm} \times 1.04 = \text{Sulphate ppm as } \text{CaCO}_3$$

$$\text{Nitrate as N ppm} \times 3.56 = \text{Nitrate as } \text{CaCO}_3$$

$$\text{Nitrate as } \text{NO}_3 \text{ ppm} \times 0.81 = \text{Nitrate as } \text{CaCO}_3$$

Add all CaCO_3 ppm quantities together and divide by 17.1 to find equivalent grains per gallon (gpg). Then, divide the total grain capacity of the unit by the gpg of CaCO_3 to determine how many gallons can be treated before regeneration.