

Maintenance and Servicing of Water Related Appliances

As kids we can all recall that cellar was not necessarily an inviting place with its shadows and strange sounding devices. As adults we recognize that most of the time this is where key water appurtenances exist. Let's describe what might be in your cellar today.

Well Pressure Tank

If you have a well for your source of water supply you will likely have a pressure tank in your cellar. It not only stores water for use it also controls the activation of your well pump through its pressure switch. It will either be of the modern bladder type (e.g. Well-X-Trol, Challenger) or the older non-bladder galvanized tank, usually 80 to 120 gallons in volume.

In the non-bladder tank type the air charge has to be periodically recharged as the air charge is gradually absorbed into the water and the tank becomes waterlogged, as evidenced by the well pump's continual cycling and low water pressure. You will note an air valve on the top of this tank for this purpose. These types of tanks also may develop leaks sooner than bladder type tanks. As the draw down water (water used between well pump cycles) inside the tank goes up and down, the internal tank surface is wetted and dried cyclically. This migration of water (wet/dry-wet/dry) accelerates corrosion and pinhole leaks will likely develop in this area. Large leaks that cause tank failure usually occur in tanks that are wrapped in an insulating blanket and the small pinhole leaks are not noticed early because they are not easily seen. Do not wrap insulation around your cold water tank unless it is essential to keeping the tank from freezing or that you find condensation of the tank's exterior is a problem.

Bladder type tanks are precharged at the factory and should hold their factory charge as the water is physically separated from the air charge. Water logging of these tanks only occurs when the internal bladder/diaphragm fails. This can be determined by tapping on the tank top and a hollow "thud" is heard. One of the

biggest drawbacks of this type of tank is the limited storage volume as, depending on the operating pressures of the tank, most of the volume is air. The higher the pressure settings (30-50psi vs. 20-40psi) the smaller the volume of stored or draw down water. A small Well-X-Trol series 100 tank will have as little as 1 gallon of useable water, which means the well pump is continually cycling on/off-on/off. This "short-cycling" severely limits the life of the well pump as well as not addressing the water demands for the home.

Keep in mind also that the addition of larger pressure tanks with an increase in storage volume can make up for a low yielding well. The tanks should be flushed **semi-annually** to remove accumulated sediments by opening the tank drain valve. These sediments could harbor and shield harmful microbes from chlorination should the well and home plumbing system require disinfection.

Hot Water Heaters

Unless your hot water comes from the coils located in your oil fired furnace you will have a stand alone hot water heater, either electric or gas fired. Regardless of the heat source hot water tanks will have similar components. They are as follows:

- Dip Tube - the dip tube directs cold incoming water to the bottom of the tank so there is no premature mixing of the cold and the outgoing hot water. If the heating efficiency of the tank suddenly drops off and you find white and granular plastic-like particles in your faucet aerators and dishwasher screens the dip tube probably has failed and has broken off inside the tank. To regain heater efficiency a new dip tube must be installed ideally one with a curved outlet to enhance the flushing of bottom sediments that accumulate over time.
- Drain Valve - this valve enables the tank to be flushed of sediments on a **semi-annual basis**, improving efficiency and operation.
- Sacrificial anode-the sacrificial anode is a magnesium or aluminum rod that helps the metal tank from corroding. Modern water heaters are glass-lined to prevent corrosion,

but assuring 100% glass coverage protection is impossible, especially since cracks in the lining may develop when the tank is in service. To prevent tank corrosion when small cracks & voids appear in the glass coating, these long anodes are inserted into the tank to provide cathodic protection. It does this by electrolysis eating away at the anode and releasing Magnesium (Mg) or aluminum (Al) electrons to coat the exposed metal surface. All metals fall somewhere on the galvanic scale of reactivity. When 2 metals are placed in water the nobler, i.e. less reactive metal, will remain intact while the more reactive one corrodes. Mg and Al are less noble than steel, which is why they are used for anode rods and in essence "sacrificial". The anode will be consumed over time and it should be inspected annually. Standard plumbing practice advises if more than 6" of the core wire is exposed at either end, the anode should be replaced. Be advised softened i.e. more aggressive water, will consume the anode at a more accelerated rate.

Some waters containing high levels of sulfates will develop a "rotten egg" smell as certain bacteria metabolize the sulfate. A magnesium anode exacerbates the problem. Replacement of the magnesium anode with one of zinc should eliminate the problem. Simple removal of the anode may work but be advised that removal of the anode may void the manufacturer's warranty on the tank and shorten the tank's useful life so check the warranty, and consult with your licensed plumber.

- Thermostat - this device controls the temperature range of the water in the tank. Factory settings are usually set at 130oF maximum to avoid scalding burns. If the hot water becomes malodorous due to microbial activity setting the thermostat higher to 160oF to kill off any noxious non-thermophilic bacteria and result in cleaner laundry and dishware. When there are young children in the house reset the thermostat back to its lower setting after a few hours. This can be done a recurring basis if the noxious odors return.

- High Temperature/High Pressure (HTHP) Valve - as the name implies this is a safety release valve that prevents tank explosion under extreme operating conditions. These valves should be activated semi-annually to assure that the valve and valve seat do not become fouled and prevent proper closure. Be advised of the scalding hazard from the water as the valve is activated. If an improperly maintained HTHP valve activates and fails to reseal your cellar will become flooded! If the device appears to activate and close on a repeating basis, high-pressure fluctuation may be evidenced and should be investigated by a professional plumber.

If you are unsure that the size of your water heater is adequate to serve the needs of your family, generic plumbing guidelines offer the following:

Family Size First Hour Rating Requirement *

2 People	45-55 Gallons
3 People	55-65 Gallons
4 People	65-75 Gallons
5 People	75-85 Gallons
6 People	85-100 Gallons
7+People	100+ Gallons

* The amount of actual water that will be heated (determined by the thermostat setting) before water temperature decrease.

Humidifiers/Dehumidifiers

Because of improper or lack of sanitary maintenance these units often become the source of noxious smelly odors due to mold growth. Depending on your tap water quality, sunlight may promote to growth of algae in the tank. If iron-bacteria is present in the tap water and the water has no free chlorine residual these microbes can flourish and clog the wetting drum/rollers.

There are several simple remedies to prevent this from occurring. Ideally distilled water should be used in ultrasonic humidifiers.

This will eliminate the deposition of scaling components in/on the units moving parts and lessen the deposition of a fine white powder on horizontal surfaces in close proximity to the unit. Thorough regular flushing of the tanks and wetting drums/rollers should keep the unit from developing noxious smells. Do not just keep adding fresh water to the tank. Depending on the size of the tank, a few drops of household bleach or Pine-Sol will help deodorize and to some extent disinfect the units. In forced air heating systems, don't forget the automatic humidifiers located in air duct coming out of the furnace. Cleaning and deodorizing these units is just as important if not more as the air is circulated throughout the house and not just in one room.

The problem of odors with dehumidifiers is not as pronounced but the condensate tanks should be flushed on a regular frequent basis. If the unit runs continually and no condensation is evident in the tank the compressor is bad or needs coolant recharging.

These suggestions and descriptions are offered to the homeowners as handy reference. If one has any doubts please contact your local licensed professional.

CAMJ (8/16/06)