

Protection for Thermal Expansion to Water Heaters

The dangers of thermal expansion

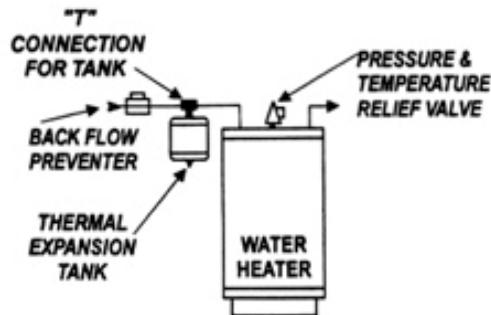
Most homes are supplied hot water from either a gas or electric heated tank. As water is heated it expands creating extra volume and pressure within the tank. The temperature and pressure are reduced when hot water is withdrawn from a faucet. The increase in pressure and volume from thermal expansion can also be reduced by water flowing back into the public water supply system. However, when a check valve or backflow preventer is installed in the service pipe a "closed system" is created. For public health protection, the water system may require the installation of a check valve or backflow preventer. In this case provisions must be made for thermal expansion or the water heater may become a safety hazard by exploding. Therefore it is essential that a temperature and pressure relief valve and (T & P Valve) and thermal expansion tank be properly installed and maintained in the plumbing system.

For most water heaters the thermostat is normally maintained at about 130° F (54° C). However, if the thermostat were to fail the T & P Valve is the primary safety feature for the water heater. The temperature portion of the T & P Valve is designed to open and vent water to the atmosphere whenever the water temperature within the tank reaches approximately 210° F or (99° C). Venting allows cold water to enter the tank. The pressure portion of a T & P Valve is designed to open and vent to the atmosphere whenever the water pressure within the tank exceeds the pressure setting on the valve. The T & P Valve is normally pre-set at 125 psi or 150 psi.

The second safety feature is the thermal expansion tank which controls the increased pressure generated within the normal operating temperature range of the water heater. The small tank is provided with a sealed compressible air cushion which provides a space to store and hold the additional expanded water volume.

Water heaters installed in compliance with current plumbing code will have both the required T & P Valve and thermal expansion tank.

Typical Residential Installation:



What can homeowners do to ensure protection from thermal expansion?

- The homeowner should check to see that an expansion tank and T & P Valve are in place. If there is any doubt, the homeowner should contact a licensed plumber for assistance.
- The T & P Valve should be periodically inspected to ensure that it is properly operating. Some T & P Valves are equipped with a test lever. Manually lifting the lever unseats the valve, allowing water to discharge. If water continues to leak from the T & P Valve after closing, the valve may need to be replaced. A drain line must be installed to avoid water damage and scalding injury when the valve operates.
- When in doubt about anything on your hot water heater consult a licensed plumber.