## How does thermal expansion affect your home?

A water heater's temperature and pressure (T&P) valve is a safety release valve. It takes extreme pressure (150 psi or greater) to make the T&P valve drip or run. Thermal expansion is often the cause for a dripping or running T&P. The T&P is not designed and manufactured for daily use, plus the dripping wastes energy and money.

There are other potential side effects of extreme pressure in the system:

- Extreme pressure in gas water heaters can collapse the flue tube, restricting flow and causing unsafe levels of carbon monoxide;
- Excess pressure can also cause damage to the tank or water lines causing possible leaks or flooding;
- Excess pressure can cause any rubber in the system to fail prematurely. This includes:
    - o   All water fixture gaskets
    - o   Dishwasher and washing machine pumps
    - o   Ice maker parts and water line
    - o   Flush valves and fixtures

The T&P valve opens, allowing heated water to escape.
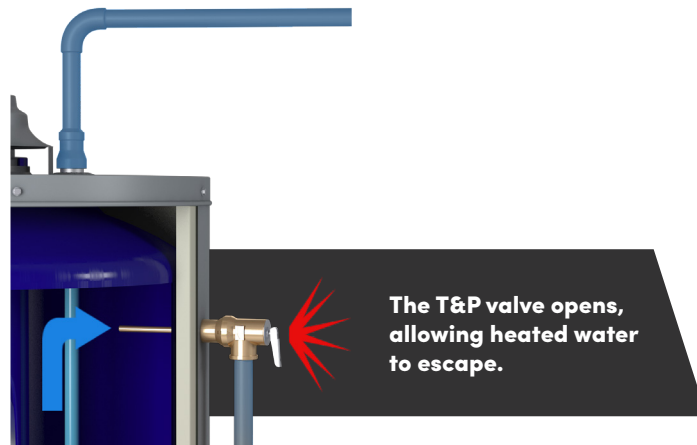
Solve the issues brought by excess pressure by installing a properly sized expansion tank.

Expansion Tank Sizing Chart

Assumed 140 Degree Maximum Temperature and 150 PSI Maximum Pressure Expansion Tank Needed

| | Water Heater Capacity (gallons) | | | | | | |
Incoming Water Pressure	**30**	**40**	**50**	**66**	**80**	**100**	**120**
40 psi	2 GAL	2 GAL	2 GAL	2 GAL	5 GAL	5 GAL	5 GAL
50 psi	2 GAL	2 GAL	2 GAL	2 GAL	5 GAL	5 GAL	5 GAL
60 psi	2 GAL	2 GAL	2 GAL	2 GAL	5 GAL	5 GAL	5 GAL
70 psi*	2 GAL	2 GAL	2 GAL	2 GAL	5 GAL	5 GAL	5 GAL
80 psi*	2 GAL	2 GAL	2 GAL	2 GAL	5 GAL	5 GAL	5 GAL

Use a pressure reducing valve for regulating inlet pressure at 60 psi

Protect your home from thermal expansion
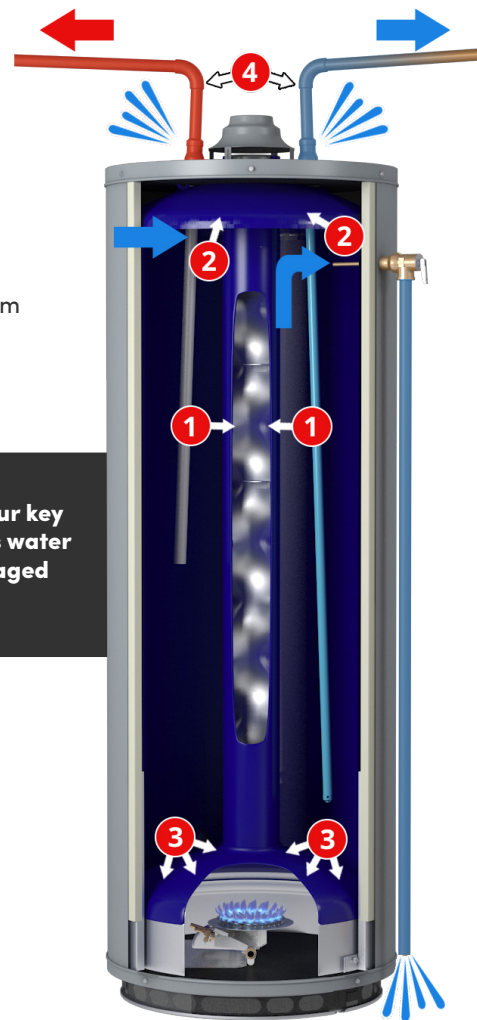
TW Series Expansion Tanks

What is thermal expansion?

When water is heated, its density decreases and its volume increases. Put simply, when water is heated it expands. In a 50-gallon water heater if the incoming water temperature is raised from 55 degrees to 120 degrees, there will be approximately one-half of a gallon of expanded water.

Water is not compressible, and this extra volume has to go somewhere. In 1985, the National Plumbing Code enacted enforced backflow prevention. Backflow prevention eliminates water flow back into the water supply during no-demand periods, causing system pressure to dramatically increase.

This image shows the four key areas on a standard gas water heater that can be damaged by thermal expansion.

Expansion Tank Quick Installation Guide*

*Note this is a brief overview of expansion tank installation. Read and follow the full instructions in the TW Series Expansion Tank manual before installing this product.
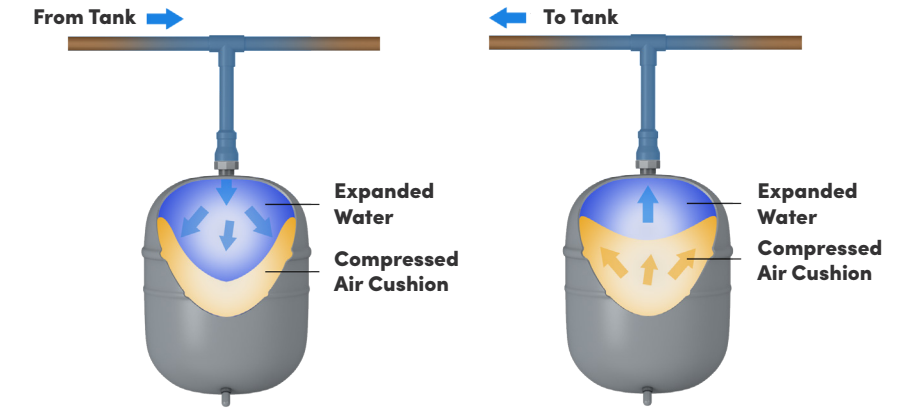
Installation

1. The water supply and power (electricity or gas) must be shut off during the installation of the valves and expansion tank.

2. Install expansion tank, pressure gauge and pressure reducing valve.

3. After installing the expansion tank and valves, it will be necessary to expel all air from the piping. Turn the cold water inlet shut-off valve "ON." To purge the air, open a faucet and wait until a steady stream of water is coming from the faucet. At this time, close the faucet.

Hot Water　**Cold Water**

Thermal Expansion Tank

Adjusting Water Pressure
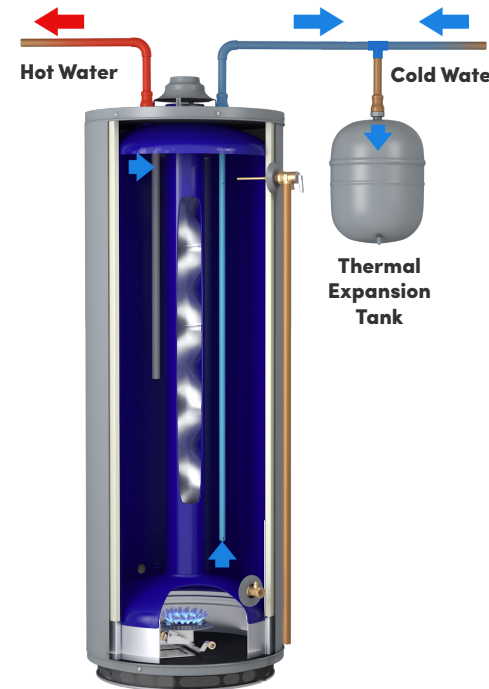
1. Recommended inlet water pressure is 60 psi or less.

2. Refer to the pressure gauge. Using the adjusting screw on the pressure reducing valve, increase or decrease the pressure as indicated on the valve.

3. Open a nearby faucet allowing water to run briefly and then close the faucet. Check pressure gauge again and make additional screw adjustments as necessary. It may be necessary to repeat this procedure several times before the pressure can be adjusted to 60 psi or less.

From Tank　　　　　　　**To Tank**

Expanded Water　　　　　Expanded Water
Compressed Air Cushion　　Compressed Air Cushion

Checking Expansion Tank Air Charge

1. Shut off main cold water supply valve.

2. Open a nearby faucet allowing water to run until it stops. This indicates the pressure has been relieved.

3. Using a tire gauge, check the expansion tank's pre-charge pressure (38 psi). **THE EXPANSION TANK AIR CHARGE MUST BE ADJUSTED TO MATCH THE INCOMING WATER PRESSURE.**

4. Open the cold water supply valve.

5. Now the water heater can be put back into operation.