



Thermal Expansion

The City of Kingsport Water Maintenance Department has begun installing water meter assemblies equipped with a dual check valve on all new service connections and as existing connections are warranted or scheduled. This assembly is to prevent potential backflow from a private water system into the public drinking supply. Backflow is the unwanted reversal of normal flow from a customer's system into the public system. **This installation will cause a customer's private system to become a "closed" plumbing system.**

The installation of the backflow prevention device is required in order to comply with the U.S. Environmental Protection Agency's Safe Drinking Water Act, Tennessee Department of Environment and Conservation 1200-05, Tennessee Code Annotated Section 68-221-701 through 68-221-720, and City of Kingsport Ordinance 4296. These rules and regulations require public water purveyors to implement programs for eliminating or controlling cross connections. A Cross Connection is any link or connection, direct or indirect, temporary or permanent, potential or existing, between a customer's private water system and the public water system through which any gas, liquid, particle, or undesirable element could be introduced into the public water system. Essentially, all recognized plumbing codes used by municipalities, cities, or states require Backflow to be eliminated or controlled. However, these devices may affect your water heater and other plumbing fixtures.

Prior to the installation of a residential dual check valve or other backflow prevention assembly, the public water distribution system had provided a 'cushion' that would absorb built up pressure within your system, usually from your water heater, and allow that pressure to 'backflow' into the public system. This reverse movement or 'backflow' from an unwanted source or private system is strictly prohibited by the abovementioned Ordinances and Regulations.

Your water heater goes through a recovery process each time hot water is used. This process can occur several times a day depending on how often hot water is demanded. As hot water is used it is replaced with cold water and the water heater begins to heat that incoming water to your desired temperature setting. This recovery process creates a condition known as Thermal Expansion- as water heats, it expands. Given that water is an incompressible liquid, it must expand by any means available, and prior to the installation of a backflow prevention device or assembly, this means was usually achieved by the 'cushion' our system had provided. Your water heater is equipped with a T&P or 'pop-off' valve which is designed to relieve excess pressure within the heater enclosure. This valve is an emergency relief valve and is not intended to compensate pressure increases created by thermal expansion.

The installation of a backflow prevention assembly, residential dual check valve, swing check, or pressure reducing valve will 'close' your private water system and prevent the heated and expanded water in your water heater from being forced into the public system. Thermal Expansion may cause the T&P valve to leak or can affect other plumbing fixtures such as solenoid valves on icemakers and dishwashers, toilet ball-cocks to leak, washing machine hoses to leak or burst, faucets to drip. It can also cause hot water to be forced into your normally cold water system. Extreme Thermal Expansion may cause serious harm to the water heater, particularly if the water heater is gas fired. Most, if not all water heater manufacturers automatically invalidate their warranty if a water heater is installed on a closed system lacking proper Thermal Expansion protection.

Thermal expansion can be easily contained through the use of either a Thermal Expansion Relief Valve, Thermal Expansion Ball-Cock, or Thermal Expansion Tank. These products are available at most plumbing supply stores. You are encouraged to have a licensed plumber inspect your system to determine the steps needed to safeguard your plumbing fixtures from Thermal Expansion. Failure to address this problem within your premises may result in serious damage to your water heater or other plumbing fixtures. The City of Kingsport Water Services Division is not responsible for any damage to private property caused by Thermal Expansion. Thermal Expansion protection has been mandated since 1994 by the Standard Plumbing Code, the International Plumbing Code, and CABO One and Two Family Dwelling Code.

Additionally, if your existing plumbing system is partially supplied, or could be supplied by a well or spring line, it is necessary to physically and permanently disconnect all plumbing fixtures from the private well or spring line prior to connecting to the public water distribution system.

Feel free to call one of our Water Quality Control Specialists if you have any questions, comments, concerns, or would like more information on Thermal Expansion or Backflow Prevention.

(423) 229-9454 7:00am-4:30pm
(423) 246-9111 emergency or after hours