PETITION FOR DECLARATORY STATEMENT
BEFORE THE FLORIDA BUILDING COMMISSION

Petitioner: Larry Burchett
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DS 2025-019

Statute(s),Code Section(s) on which Declaratory Statement is sought:

2017,2020,2023 Florida Building Code, Plumbing, Residential Editions
Codes P2903.4 / P2804.6 / M2005.1

Background:

A small community located in Naples Florida within Fiddlers Creek, had about one hundred homes built between 2019 and 2023. Starting in 2022, some of these homes had premature failures of swimming pool auto-fill valves rated at 100 psi maximum. Also, toilet fill valves were failing and leaking causing early replacement. Several pressure tests were performed on the properties, and pressures exceeding 120 psi were found during the heating cycles of hot water storage heaters. What was discovered led up to this request to the Florida Building Commission.

Findings:

The cause of the fluctuations and of high pressures on the closed loop plumbing systems within the one hundred homes was in fact no thermal expansion control, or lack of. Pressure readings were taken at the heater tanks and on outdoor hose bibs resulting in pressures from house to house between 120 psi and 128 psi during heating cycles of the hot water heaters. Findings showed no thermal expansion tanks installed at the hot water heaters. The industry standard of a maximum 80 psi regulation was overlooked by Collier County Inspections, the Builder, and the contracted Plumber. This plumber decided to circumvent the heater manufacturer requiring thermal expansion tanks and substitute pressure relief valves rated at 125 psi. These secondary pressure valves are not only not designed for this particular purpose, but were installed before, (upstream) of the heater shutoff valve, totally isolating the relief valve from the hot water heater if the ball valve was closed allowing homeowners, or home watch personnel to shut off incoming water to the heater tank, thereby isolating any secondary pressure relief caused by thermal expansion. Pressures would be allowed to rise during heating cycles at dangerous levels.

Findings cont.:

A Court Case was found concerning this situation where a homewatch person turned off the supply line to the hot water heater and failed to turn off the water heater gas valve. Pressures and temperature increased enough during the heating cycles causing the older CPVC plumbing connected to the hot water tank to crack and burst water, causing hundreds of thousands of dollars in damage to the residential properties below. CPVC pipe maximum pressures are high during cold temperatures, but when temperatures increase, the PSI ratings drop considerably, especially when these pipes become brittle over the years.

Evidence and Research:

Investigations were performed when using pressure relief valves designed to open and close at a designed pressure or a dialed in pressure manufactured by several plumbing manufacturers. Findings proved that these valves were never designed to drip continuously by substituting them as a thermal expansion tank. They were not designed to open-close tens of thousands of times, in fact, a maximum common rating was one hundred times. We did locate several valves that are rated for this situation, however, these valves have a shutoff valve connected to it, allowing it to replace the common ball cock valve water shutoff connected to all water heaters, and also control pressure caused by thermal expanding water. When this valve is turned off, the secondary pressure relief valve stays connected to the heater tank, thereby never blocked from the heater tank plumbing by the use of a shutoff valve, allowing continuous pressure relief. See a Zurn Model BVECXL as an example. Technical Bulletin attached for the BVECXL.(DOC-A attached) Also attached: (DOC-B) email from Zurn Engineer concerning using pressure relief valves for thermal expansion control.

All water heater manufacturers have installation instructions that trump any plumbing codes, since they are more restrictive and demanding and affect the Warranty of the appliance. They all show a thermal expansion tank plumbed in at the hot water heater on closed loop systems, and list the Dangers of not using one, voiding any warranties. There are no drawings found showing the acceptance or use of any secondary pressure relief valves rated lower than the T&P valve installed at the tanks ports. There are no alternate drawings.

National plumbing codes were researched, nowhere is there any acceptance of using any pressure relief valve to control pressure on a hot water heater that can be isolated by a shutoff valve to the heater tanks. In fact, there are no plumbing codes allowing a shut off valve to be installed on any appliance, device, or pool heater, that isolates the relief valve from the heating device.

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Questions for the Florida Building Commission:

Question #1:
Section M2005.1 General / "Water heaters shall be installed in accordance with Chapter 28, the manufacturer's instructions and the requirements of this code"

**Since the builder and plumber allowed the substitution of a thermal expansion tank required by the manufacturer to be substituted, using a relief valve, is this Code applicable in this situation ?

Answer: We believe the answer is Yes, for the following reasons:

1. Strict instructions from the manufacturer of the hot water heater show explicit drawings and directions saying to install a thermal expansion tank at the heater on a closed loop system. Sample install instructions are attached for review. (DOC-C)

2. Since the installation instructions affect the heater Warranty and safety, the Manufacturer requirements are more stringent than the Florida Plumbing Code, thereby having stricter guidelines and precedence.

Question #2:

Code Section P2903.4 Thermal Expansion Control stipulates a reference to other sections that direct a maximum pressure of 80 psi in the residential plumbing system as the highest possible measurement, created from street pressure or pressure created due to thermal expansion.

**Since the builder and plumber allowed the use of a pressure relief valve rated at 125 psi to be used as a substitution of a thermal expansion tank, is this Code section applicable in this situation?

Answer: We believe the answer is Yes, for the following reason:

1. There is nothing plumbed into the entire closed loop system that would stop or regulate any pressures during thermal expansion to stop or limit the 80 psi requirement of P2903.4. The County water regulator only controls street pressure, not pressure caused by thermal expansion.

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Question 3: (4 connected questions)

Code Section P2903.4 Thermal Expansion Control
"A means for controlling increased pressure caused by thermal expansion shall be installed where required in accordance with Sections P2903.4.1 and P2903.4.2."

**Does the wording " a means for controlling increased pressure" , allow for any means ?
**As an example, could you use a hot water bottle plumbed into the system ?
**Could you use a pressure cooker blow off valve to control pressure ?
**Could you use a non-rated ASME Device to control increased pressure ?

Answer: We believe that " a means for controlling" would be an approved device by the Manufacturer of the appliance, and not just some kind of jury rig device or valve. And this Device should be ASME Approved, ANSI/NSF Approved, and EPA Approved for that particular use. This Code needs to be clarified by Definition and approved installation locations since this is a State Code. Local jurisdictions may apply unsafe procedures or allow procedures that conflict with appliance manufacturers instructions. The State of Florida would have no idea these jury rigged procedures were put in place by possibly retired plumbers in the Inspection Divisions who want to make it easier for the plumbing industry. The Florida Building Commision would have no control over this type of scenario since no one would ever report it.

The use of a pressure relief valve to control pressure during heating cycles of hot water heaters have been approved by some agencies as IAPMO. See Zurn Valve called a "thermal expansion control valve" Model BVECXL. The difference between this valve and any generic relief valve is that this one is engineered differently and must be installed on the heater tank and a drip relief to a floor drain or outside via tubing. This valve has also been tested to partially open close thousands of times, where generic relief valves are not designed to perform in this situation. This Petitioner does not fully agree with the design of this product because it does not control pressure ounce by ounce pound by pound allowing pressure fluctuations. This is why hot water heater manufacturers do not show this kind of thermal expansion valve either in any of their installation instructions, only thermal expansion tanks.

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Question 4.

Code Section P2804.6 Installation of relief valves.

This particular Code is listed under Chapter 28, Water Heaters, and has three sections. 1-3

This question relates to #3 "A check or shutoff valve Shall Not be installed in any of the following locations."
#3 "Between a relief valve and heating appliances or equipment"

****Question:** Can a Shutoff Valve be installed between any relief valve and the hot water heating device ?, or worded differently, Can a relief valve be installed in front (upstream) of a shutoff valve and the hot water heater to control pressure created by thermal expansion?

Answer: We believe the answer is No for the following reasons:

Even though this Code section is directed at hot water heater emergency relief valves, there is no redirect in the Code to allow any pressure relief valve to be isolated by a shut off valve to the heater tanks.
There have been arguments by local plumbers that this Code Section does not apply to secondary pressure relief valves used in addition to the emergency ones installed on the heater tank. However, the Code read by itself specifically says "A shutoff valve Shall Not be installed in any of the following"
The" following" does not say or indicate only in this situation> (meaning emergency relief valves mounted-installed on the heater tank). In direction as to the 150 psi T&P emergency relief valve.

If the intention or Administrative Intent was for only specific Relief valves, then the specific wording would say : " A shutoff valve Shall Not be installed in any of the following locations, other than to control thermal expansion at a remote location " This directive has been limited and is not interpreted as to a limited issue of the T&P Valve or the Temperature Valve or a Pressure Valve. It specifically says "Between A relief valve" and does not say "Between the heater's relief valve or the heater's T&P valve" provided by the heater Manufacturer.

The Directive and applicability indicates "A relief valve" meaning Any relief valve.

Answer cont.:

Also, the Directive does not say "The relief valve" indicating the T&P valve or separate emergency temperature and relief valves. Specifically says "A relief valve"

This Code reveals a purpose, which is to prevent any shutoff valve that allows the isolation of any relief valve and the heater tank because all relief valves are a safety device that control pressure. This safety device or these devices work when uncontrolled high pressures or temperatures reach dangerous levels, plus prevent heating equipment from having someone turn off that protection or function of that device from working. What good would any relief valve be if it could be turned off accidentally or on purpose in any situation ?

Some homewatch people actually believe that when a pressure valve drips, it is leaking, therefore it must be turned off. So in one Court Case this actually happened, where the tank's T&P Valve was leaking and the homewatch person shut off the hot water tank inlet supply ball valve, thereby isolating the remote secondary relief valve installed away from the heater tank, causing high pressures and temperature to rise. This put pressure on the CPVC plumbing on top of the heater tank and the pipe blew apart allowing water to run for days to the properties below.

P2084.6 (3) should not allow ANY Relief Valve to be isolated with a shutoff valve and the heating device or appliance.
Note the email from a Zurn Engineer stipulating that a secondary pressure relief valve can be used with the use of a thermal expansion tank as a "backup" if the thermal expansion tank fails the secondary relief valve would drip, alerting the homeowner or home watch person there is a problem. In this case with a thermal expansion tank plumbed in, the secondary pressure relief valve also should not be isolated by a shutoff valve. This Code section would apply here also.

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Conclusion:

South Florida has many retirees that travel north during long summer months and return when the heat and humidity decrease. This leaves many properties vacant, where hot water heaters remain operating and creating thermal expansion. Not all residents turn off their heating water heaters, this can cause high pressures developing, strain on plumbing systems and the storage tank if proper control of thermal expansion does not exist. Plumbers and Contractors consistently take short cuts and when challenged they show the Florida Building Code is vague concerning “How to control thermal expansion” The Florida Building Commision needs to expand and create clarity in this situation.
We believe the use of a remote located relief valve, isolated from the heating device (hot water heater tank), by a shutoff valve,substituting a required thermal expansion tank is a shortcut and misapplication of interpretation of this Code and the IPC.

In addition, attached to this Petition please find five PDF files for consideration.

Thank You,

Larry Burchett

Larry Burchett
HOA Technical Advisor
Dated 06/24/2025

Model BVECXL

Full Port Bronze Ball Valve with Integral Thermal Expansion Control Valve

Application

The ZURN WILKINS Model BVECXL is designed for residential water heater applications where a water heater shut-off and thermal expansion relief valve are combined to provide protection from thermal expansion. Ideal where lead-free* valves are required.

Standards Compliance

- UPC® Listed to IGC 128-2019
- Certified to NSF/ANSI 372*

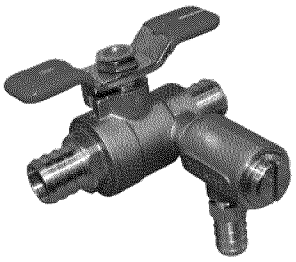
*(0.25% MAX. WEIGHTED AVERAGE LEAD CONTENT)

Materials

FNPT valve Body	Low Lead Cast Bronze ASTM B 584
Copper sweat Body	Low Lead Forged Brass
PEX Body	
Ball	Chrome plated Low Lead Brass
Stem	Brass ASTM B 16
Seats & Stem packing	TFE virgin Teflon ®
Thrust washer	TFE virgin Teflon ®
Handle & nut	Stainless steel
Relief valve body	Low Lead Forged Brass
Relief valve spring	Stainless steel, 302 Series
Relief valve seat washer	Buna Nitrile (FDA approved)
Relief valve plunger	Brass ASTM B 16 & screw

Features

Sizes: 3/4", 1"	
Pressure rating	400psi WOG
Temperature rating	180°F
Threaded Connections	ANSI B1.20.1 Class 125



LEAD FREE

LOW-LEAD UPC ®

Shutoff Valve Options:

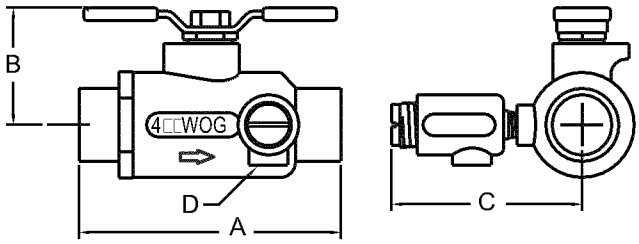
- ☐ C - With integral female copper sweat connection (3/4" only)
- ☐ PEX - With integral crimp PEX connections (3/4" only)

Relief Valve Options:

- ☐ 80 - with 80 psi relief setting
- ☐ 100 - with 100 psi relief setting
- ☐ 125 - with 125 psi relief setting
- ☐ BF - 3/8" hose barb drain fitting
- ☐ CF - 3/8" hose compression fitting
- ☐ PEX - 1/2" Crimp PEX drain fitting

Accessories:

- ☐ Replacement Relief Valve (Model P1560XL)

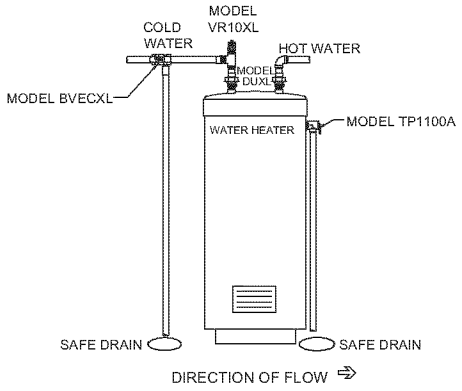


(Model 34-BVECXLC Shown)

Dimensions & Weights (do not include packaging)

MODEL	SIZE		CONNECTION	DIMENSIONS (approximate)							WEIGHT	
				A		B		C		D		
	in.	mm		in.	mm	in.	mm	in.	mm		lbs.	kg
34-BVECXLC	3/4	20	SWEAT	3 15/16	100	1 15/16	49	2 13/16	71	1/8" FNPT	1 3/8	0.6
34-BVECXL	3/4	20	FNPT	2 3/4	70	1 5/8	41	2 13/16	71	1/8" FNPT	1	0.5
1-BVECXL	1	25	FNPT	3 1/4	83	1 15/16	49	2 15/16	75	1/8" FNPT	1 1/2	0.7
34-BVECXLPEX	3/4	20	CRIMP PEX	3 3/16	81	1 1/2	38	2 1/2	64	1/8" FNPT	1	0.5

Typical Installation



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Rev. E
Date: 5/23
Document No. BV-BVECXL
Product No. Model BVECXL
Patent.zurn.com/patents

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RE: 02006622 - PN:P1000AXL Information

wilkinscs@zurn.com <wilkinscs@zurn.com> Wed, Apr 30, 2025 at 12:58 PM
To: "larryhoacapistrano@gmail.com" <larryhoacapistrano@gmail.com>
Cc: "brianna.greenway@zurn.com" <brianna.greenway@zurn.com>

Larry,

Apologies for the delay in getting a response back on your inquiry into the P1000-AXL. Our Sustaining Team had to do a bit of research. Below is the response I received to the questions you asked during our conversation:

The P1000AXL is not intended to be a primary thermal expansion device, but to answer the question, per the ANSI Z21.22/CSA 4.4 standard, it is cycled 100 times to check for proper reseating. It is not intended to be cycled an "unlimited" amount of times. It could be used as an auxiliary relief valve in a system that already has a proper T&P valve on the hot water tank, and a thermal expansion tank, so that if it does open it would indicate the expansion tank is not working or charged properly. On our spec sheet rev. F we have removed all references to thermal expansion and show the P1000AXL on a cold water storage tank for pump relief, in which case there are low pressure applications for the 30 PSI and 75 PSI settings.

This issue should be resolved by referencing local codes. The UPC, IPC, and ASME boiler code require thermal expansion tanks to be installed on systems. If local codes allow other methods, then I would recommend our model BVECXL expansion control valve. This relief device is certified to IAPMO IGC 128 and is cycled 10,000 times, so it is intended to be used as a thermal expansion device.

Jody Buchholtz
Applications Engineer
Zurn Wilkins | Paso Robles, CA
Office: 855-663-9876

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Water System Piping

Piping Installation

Piping, fittings, and valves should be installed according to the installation drawing (Figure 16). If the indoor installation area is subject to freezing temperatures, the water piping must be protected by insulation.

The water supply pressure should not exceed 80 psi. If this occurs, a pressure reducing valve with a bypass should be installed in the cold water inlet line. This should be placed on the supply to the entire house in order to maintain equal hot and cold water pressures.

IMPORTANT: Heat cannot be applied to the water fittings on the heater as they may contain nonmetallic parts. If solder connections are used, solder the pipe to the adapter before attaching the adapter to the hot and cold water fittings.

IMPORTANT: Always use a good grade of joint compound and be certain that all fittings are drawn up tight.

1. Install the water piping and fittings as shown in Figure 16. Connect the cold water supply (3/4" NPT) to the fitting marked "C". Connect the hot water supply (3/4" NPT) to the fitting marked "H".

IMPORTANT: Some models may contain energy saving heat traps to prevent the circulation of hot water within the pipes. Do not remove the inserts within the heat traps.

2. The installation of unions in both the hot and cold water supply lines is recommended for ease of removing the water heater for service or replacement.
3. The manufacturer of this water heater recommends installing a mixing valve or an anti-scald device in the domestic hot water line as shown in Figure 17. These valves reduce the point-of-use temperature of the water by mixing cold and hot water and are readily available for use.
4. If installing the water heater in a closed water system, install an expansion tank in the cold water line as specified under "Closed System/Thermal Expansion" section.
5. Install a shut-off valve in the cold water inlet line. It should be located close to the water heater and be easily accessible. Know the location of this valve and how to shut off the water to the heater.
6. A temperature and pressure relief valve must be installed in the opening marked "Temperature and Pressure (T & P) Relief Valve" on the water heater. A discharge line must be added to the opening of the T&P Relief Valve. Follow the instructions under "Temperature and Pressure Relief Valve" section.
7. After piping has been properly connected to the water heater, remove the aerator at the nearest hot water faucet. Open the hot water faucet and allow the tank to completely fill with water. To purge the lines of any excess air, keep the hot water faucet open for 3 minutes after a constant flow of water is obtained. Close the faucet and check all connections for leaks.

Figure 16
Water Piping Installation

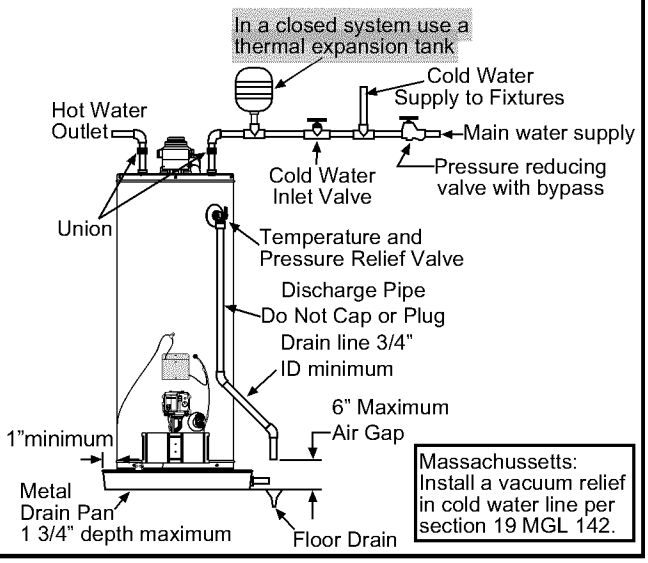
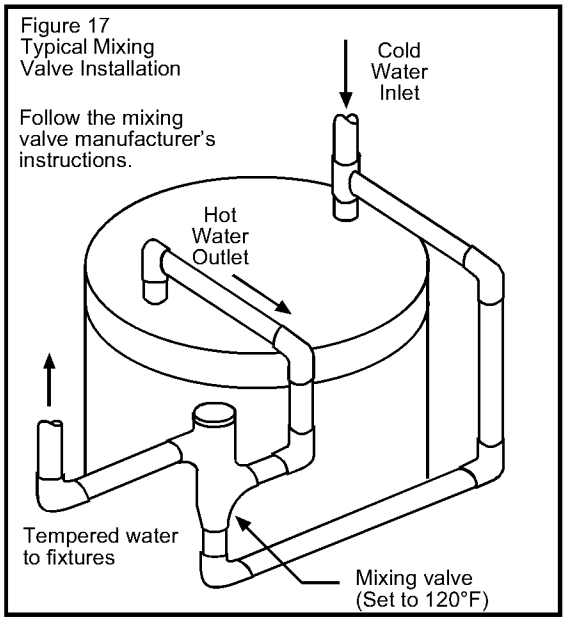


Figure 17
Typical Mixing Valve Installation



Please note the following:

- The system should be installed only with piping that is suitable for potable (drinkable) water such as copper, CPVC, or polybutylene. This water heater must not be installed using iron piping or PVC water piping.
- Use only pumps, valves, or fittings that are compatible with potable water.
- Use only full flow ball or gate valves. The use of valves that may cause excessive restriction to water flow is not recommended.
- Use only 95/5 tin-antimony or other equivalent solder. Any lead based solder must not be used.
- Piping that has been treated with chromates, boiler seal, or other chemicals must not be used.
- Chemicals that may contaminate the potable water supply must not be added to the piping system.
- This water heater is suitable for combination water (potable) heating and space heating and not suitable for space heating applications only.

Closed System/Thermal Expansion

⚠WARNING

Explosion Hazard

If the temperature and pressure relief valve is dripping or leaking, have a qualified person replace it.

Examples of a qualified person include: licensed plumbers, authorized gas company personnel, and authorized service personnel.

Do not plug valve.

Do not remove valve.

Failure to follow these instructions can result in death, or explosion.

As water is heated, it expands (thermal expansion). In a closed system, the volume of water will grow. As the volume of water grows, there will be a corresponding increase in water pressure due to thermal expansion. Thermal expansion can cause premature tank failure (leakage). This type of failure is not covered under the limited warranty. Thermal expansion can also cause intermittent temperature-pressure relief valve operation: water discharged from the valve due to excessive pressure build up. The temperature-pressure relief valve is not intended for the constant relief of thermal expansion. This condition is not covered under the limited warranty.

A properly-sized thermal expansion tank should be installed on all closed systems to control the effects of thermal expansion. Contact a plumbing service agency or your retail supplier regarding the installation of a thermal expansion tank.

AIR SUPPLY AND VENTILATION

Proper air supply and ventilation are essential to the safe, effective operation of this residential gas water heater. Air supply and ventilation must be in accordance with local codes or, in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the Natural Gas and Propane Installation Code, CSA B149.1.

Air Supply

If the water heater is installed in an open room of a conventionally constructed building, sufficient air is typically present for proper combustion and ventilation. However, if the water heater is installed in a confined space or tightly insulated home, additional provisions must be made for combustion and ventilation air. A confined space offers less than 50 cubic feet of air per 1,000 BTUH (British thermal units per hour) for the appliances in that space. Each appliance's BTUH requirements should be listed on its rating plate.

Without an adequate supply of clean air, the water heater's pilot light will not function properly, and excessive amounts of carbon monoxide may be produced.

Corrosive Atmospheres

A corrosive atmosphere is created when compounds from aerosol sprays, cleaning products such as bleach and detergents or other chemicals become airborne and are drawn into the combustion air supply of a water heater or other gas appliance. When these compounds pass through the gas flame, they create corrosive elements that shorten the life of the appliance. Damage due to a corrosive atmosphere is not covered under the warranty.

AIR SUPPLY AND VENTILATION (Cont.)

Ventilation

The ventilation system for this water heater must be properly installed by a qualified service technician and free from any obstructions. The vent should not be shared by any power-vented appliance, nor should a damper be used anywhere in the system.

The new vent hood (provided with the water heater) must be attached to the gas vent or chimney by vent pipes. The diameter of the vent pipes must match that of the vent hood or be larger.

At least 12" of vertical vent pipe is recommended from the vent hood. Horizontal pipes must maintain a vertical pitch of at least 1/4" per foot, and the termination must be vertical. Vent joints must be secured by an approved method, such as sheet metal screws.

After the water heater's main burner has been in operation for 5 minutes, the vent hood can be tested for spillage by holding a lighted match or candle close to the vent hood relief opening. The smoke or flame should be pulled towards the opening.

For additional information, consult local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the Natural Gas and Propane Installation Code, CSA B149.1.

THERMAL EXPANSION

If the home's inlet water line includes a check valve, this will prevent water from flowing back into the city's water supply, creating a closed water system in the home. Heated water expands, causing increased pressure, which is then trapped in a closed water system. Referred to as thermal expansion, this rapid pressure increase can cause the water heater's relief valve to operate (releasing water) during heating cycles, potentially causing premature failure of the valve or the water heater. To control thermal expansion, install a thermal expansion tank in the cold water line between the water heater and check valve, as shown in the next illustration, page 16. Contact your installing contractor, water supplier or plumbing inspector for additional information.

Installation Instructions

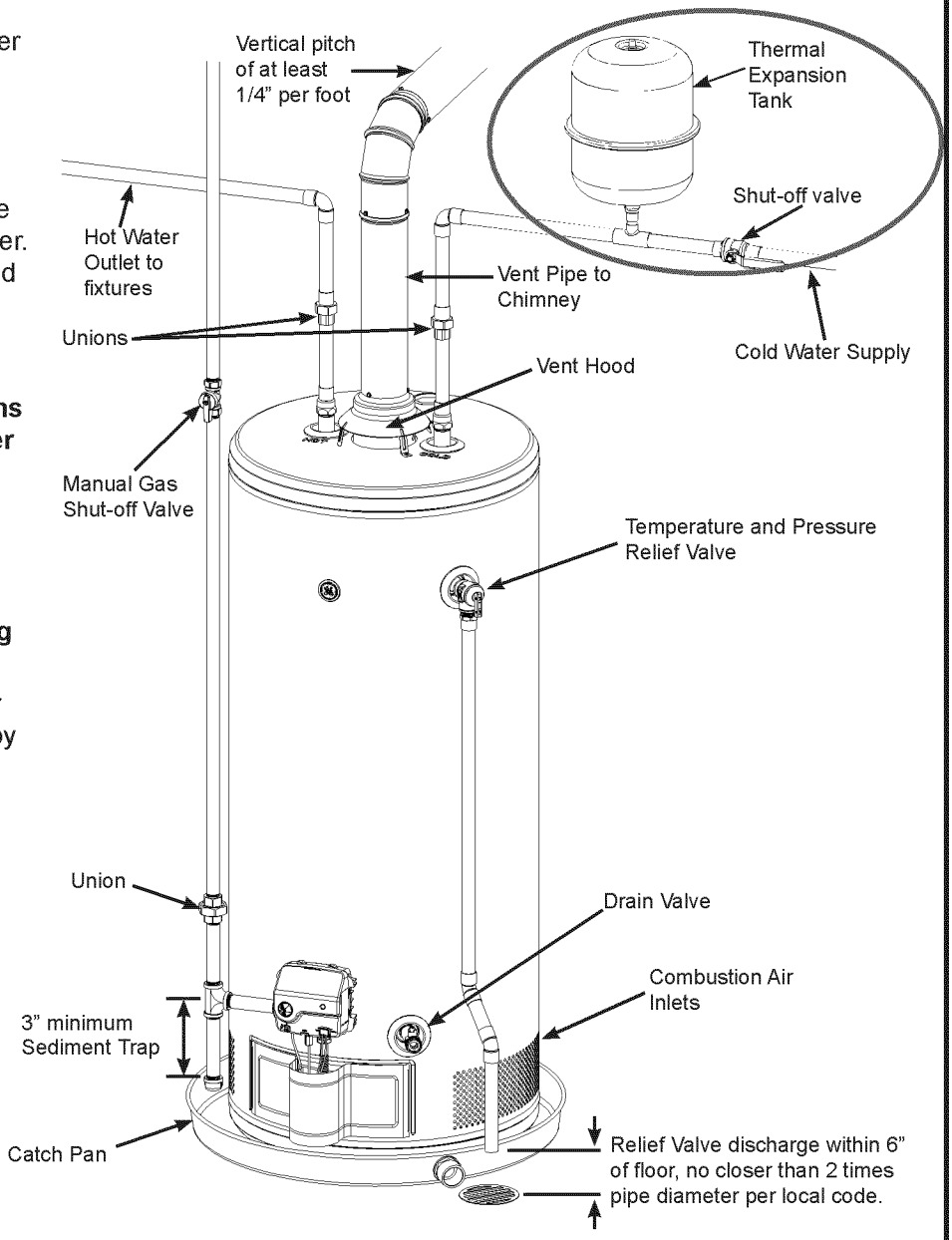
WATER SUPPLY AND DRAINAGE

Refer to the illustration below for recommended installation. The HOT and COLD water connections are 3/4" NPT (National Pipe Thread) and are clearly marked on all models. Use 3/4" female NPT fittings with sealant suitable for potable water when connecting to the inlet/outlet ports. The installation of unions is recommended on the HOT and COLD water connections so that the water heater may be easily disconnected for service. Piping should be routed to allow for anode rod inspection and service.

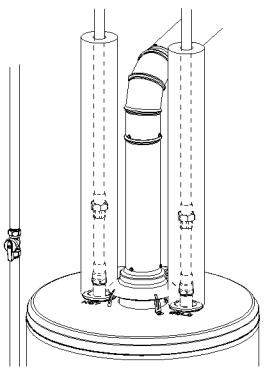
NOTE: Install a shut-off valve in the cold water line near the water heater. This will allow for easier service and maintenance of the unit.

IMPORTANT: Do not apply heat to the HOT or COLD water connections. If sweat connections are used, sweat tubing to adapter before fitting the adapter to the COLD water connections on the water heater. Any heat applied to the HOT or COLD water connections will permanently damage the internal plastic lining in these ports.

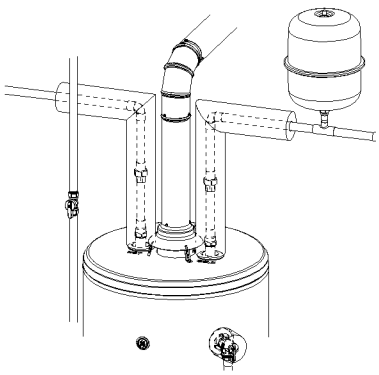
Install a vacuum relief valve and/or anti-siphon device when required by local jurisdictions.



Typical vertical piping



Typical horizontal piping



HOT AND COLD PIPE INSULATION (if supplied with product)

For increased energy efficiency, some water heaters have been supplied with two 24" sections of pipe insulation. Install the insulation according to the illustrations on the right, as best meets your requirements.

Discharging Temperature and Pressure Relief Valves

Model(s) Affected: All Residential & Commercial Units

More and more housing developments are being constructed in areas where the local water utility is supplying these projects with extremely high water main distribution pressure. Contractors are installing water pressure reducing valves in the service. These reducing valves are available with or without a back flow check. In the case where the reducing valve does not permit back flow, we have found by tests that for every degree rise in the temperature there is a build up of pressure from 4 to 6 pounds per square inch in the water heater tank. Under these conditions the tank would be subject to a minimum of 240 PSI with a 60 degree rise in water temperature (4 x 60 = 240) and minimum 400 PSI with a 100 degree rise in water temperature (4 x 100 = 400) and since the tank is designed to withstand a test pressure of 300 PSI, it can be easily understood that the tank may very well rupture unless a temperature and pressure relief valve is installed in the water heater.

Where a temperature and pressure relief valve is used on a water heater installation, as described above, every time the water heater cycles on the relief valve will discharge or drip.

To correct this problem:

Replace the water inlet pressure reducing valve with a valve that has a back flow by-pass built into it. This will permit the water to expand back into the main supply when heated.

Or, if codes require a back flow prevention device a properly sized thermal expansion tank should be installed in the supply side piping of the water heater.

The above does not only apply to areas with extremely high main distribution water pressure, but will also occur in areas where the utility will require a check valve in front of the water meter, or where codes require backflow prevention devices installed in the water service.