



PLANNING AND DEVELOPMENT SERVICES

BOISE CITY HALL: 150 N. CAPITOL BLVD | MAIL: PO BOX 500, BOISE ID 83701-0500
CITYOFBOISE.ORG/PDS | P: 208-608-7100 | F: 208-384-3753 | TTY/TTD: 800-377-3529

PDS

Document Number

#420-A

Water Heater Installation Guide

The purpose of this guide is to provide the installer insight into what the inspector will be looking for on your inspection and answer some common installation questions.

Included is a full-page image of a typical water heater installation with key points highlighted. While there may be items unique to your application, these are the items that your inspector will be focusing on. This picture provides a general view and will cover most applications.

For further questions, after reviewing this document, please contact the Planning and Development Services Building Division at (208) 608-7070.

Gas

1. Use proper gas line sizing. The gas line size must be verified if the British Thermal Unit (BTU) rating on the new water heater is higher than that of the existing water heater. For example: A standard 50-gallon gas fired water heater has an average rating of 40,000 BTU'S. The average tankless water heater's rating is 180,000 BTU'S, which normally will require a larger gas line. The BTU rating is found on the heaters rating sticker.
2. The gas line requires a dip leg prior to entering the water heater gas valve. This is simply a tee facing straight down with a nipple and cap. (See Drawing #1)
3. The water heater gas shut-off valve must be within six (6') feet of the water heater.
4. When used, verify that the new gas flex, is properly sized for the BTU rating on the water heater. Gas flex connectors cannot be reused per manufactures installation instructions.
5. When the gas line is hard piped to the water heater, a union must be installed within twelve (12") inches of the gas valve in-between the water heater gas valve and the shut-off valve.
6. Gas systems with delivery pressures two pounds (2lbs) or higher require a listed Medium Pressure Regulator complying with ANSI Z21.80, sized suitable for the inlet and outlet gas pressures for the application. The regulator shall be installed in an accessible location downstream of the shut-off valve. The MP regulator must be vented to the outside or provided with a leak limiting device. A tee fitting with one opening that is capped or plugged shall be installed between the shut-off valve and the MP regulator. (See Drawing #2)

7. For non-sealed combustion water heaters, if installed in a garage, the water heater burner and ignitor are required to be a minimum of eighteen (18") inches above the garage floor.

Electric Water Heaters

1. Electrical wiring is required to be inside an electrical conduit with approved electrical connectors.
2. If installed in a garage, the lowest heating element is required to be a minimum of eighteen (18") inches above the garage floor.

Flue

1. Visually inspect the flue piping. Look for any rust or white powder flakes. If you have either condition, replace the flue pipe and fittings.
2. Each single-wall flue joint requires three self-tapping screws spaced equally around the joint. This holds the joint together.
3. A single-wall vent connector must have six (6") inches of clearance from any combustible material. Double-wall vent connector requires a one (1") inch clearance.
4. The flue must be separated from the insulation in the attic. Install an insulation shield a minimum of three (3") higher than the insulation height and provide no less than a one (1") inch space between the shield and the flue vent pipe. (See Drawing #3)
5. Support the vent connector as needed to prevent stress on a joint or sags.

Temperature and Pressure Relief Valve

1. The adapter that screws into the T&P valve must be metallic or a combination of plastic (CPVC) and metal threads.
2. The drainpipe material to the T&P must be copper tubing, CPVC, [or](#) galvanized pipe, or an AMSE A112.4.1-2009 listed pipe. The use of a water heater flex connectors is prohibited.
3. The valve must be piped to either an approved drain, the garage floor or outside of the building.
4. The drain line must grade away from the valve
5. For drains that cannot grade away from the valve; pipe the drain up to a level high enough to grade away from the valve. It is imperative that an 1/8" hole be drilled into the lowest point closest to the T&P valve to act as a drain indicator.
6. The T&P drain line cannot drain into the water heater drain pan.
7. The termination of the drain line must point down and never be turned more than 45 degrees from the Six o' clock position (straight down). It can never be threaded or plugged.
8. The drain line must equal the full size of the valve outlet and can never be reduced. The use of water heater flex connectors is prohibited.

Water Connections, Drain Pan & Expansion Tank

1. A full-sized shut-off valve must be located on the cold side inlet.
2. If the heater is hard piped, unions are required within twelve (12") inches of the water heater.
3. A water heater drain pan is required on any floor surface other than concrete. The diameter of the pan must be larger than the water heater per the manufacturer's installation instructions but can never be less than a one (1") inch clearance for the entire circumference between the heater and the pan.
4. Gas fired water heaters require a metal drain pan or be listed/approved for use with a gas fired water heater.
5. The water heater drain pan must be piped to an approved drain, the garage floor, or to the outside of the building with grade away from the pan.
6. An expansion tank must be installed on the water system if a closed system is created. This means if a check valve is installed on the cold-water side or a pressure reducing valve is present in the water supply.
7. Water heater flex connectors cannot exceed 24" nor can two flex connectors be tied together.

Clearances

1. The manufacturer's installation instruction will provide clearance distances from the front, sides and back of the heater to any combustible material.

Combustion Air

1. The manufacturer's installation instructions will provide the required combustion air requirements. It is imperative that the proper combustion air is provided.

Carbon Monoxide Detectors

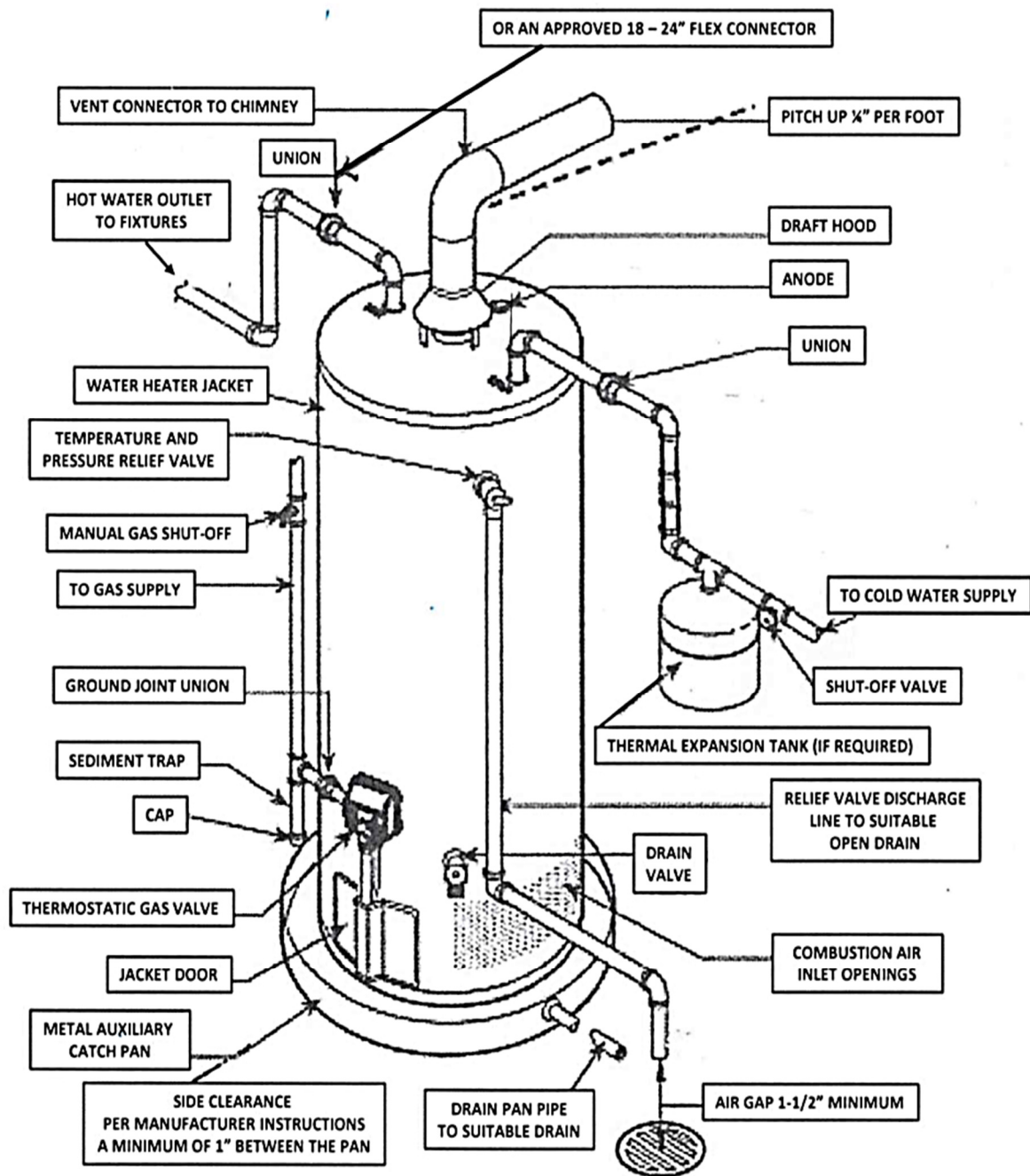
1. An approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units within which fuel-fired appliances are installed, and in dwelling units that have attached garages.

Start-up

1. Follow all manufacturer's start-up instructions.

Tip - Open a hot water tap, preferably on a bathtub or a shower, while the water heater is being filled to expel the air out of the water heater. Turn-off the fixture valve after the water clears up and all air is out of the system.

TYPICAL INSTALLATION



DRAWING #1 – DRIP LEG EXAMPLE

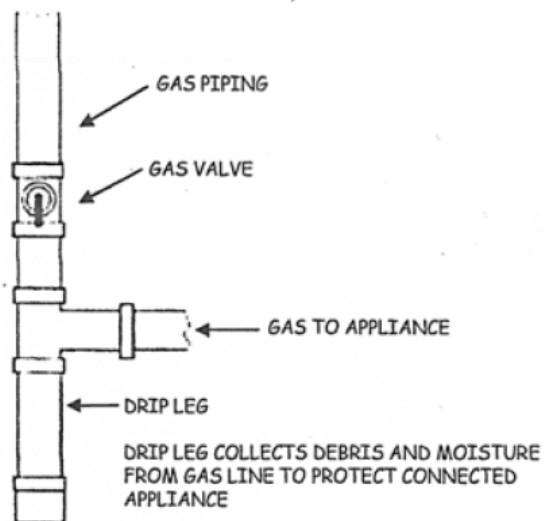
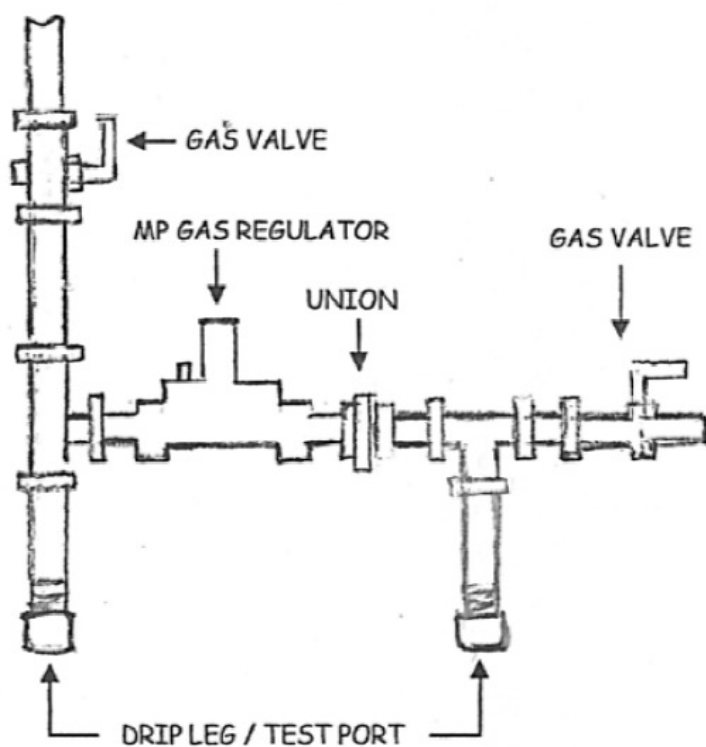


DIAGRAM #2 – M P GAS REGULATOR SET UP EXAMPLE



DRAWING #3 – FLUE SHIELD EXAMPLE

