



# Building & Safety Division

## Community Development

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### RESIDENTIAL WATER HEATER REPLACEMENTS

Installation of a water heater requires obtaining a building permit and must comply with the current California Plumbing Code (CPC), California Mechanical Code CMC), and California Energy Code (CEnC). For safety, it is vital to follow all specification and regulations regarding the location and replacement of water heaters.

The all types of water heaters must meet or exceed the requirements of CPC Sections 301 & 501 including the first hour ratings of Table 5-1 in Chapter 5 shown below. The unit must also meet applicable energy efficiency requirements of the current CEnC. The first hour rating is found on the Energy Guide label on the appliance. Each installed water heater must have a delivery capacity as determined by the manufacturer’s recommendations.

Table 5-1 First Hour Rating of the California Plumbing Code

Number of Bathrooms	1 to 1.5			2 to 2.5				3 to 3.5			
Number of Bedrooms	1	2	3	2	3	4	5	3	4	5	6
First hour rating, gallons	42	54	54	54	67	67	80	67	80	80	80

**Location:** Gas fired water heaters use fuel combustion for heat. For safety, shall NOT be installed in bathrooms, clothes closets, or rooms used for sleeping. Do not install them in any closet or confined space that open into a bathroom or bedroom. CPC 504. There is an exception for direct vent water heaters in compliance with CPC 509.8.2. Provide combustion air in accordance with CPC 506.

Tank-less water heaters are often located similarly to traditional water heaters and must be installed in accordance with CPC as noted above. Additionally, units listed for exterior use may be located on an exterior side or back wall. In all cases, the location must provide for access and clearances as specified by codes. When installed outdoors, the power for the unit must be a GFCI protected receptacle with a waterproof bubble cover, or be hardwired (preferred).

**Attics.** If installation requirements are met for access, clearances to combustibles, switched lighting, and adjacent receptacle, water heaters may be installed in an attic. Access to the attic may not be from a bedroom or bathroom; however, access from a walk-in closet is allowed. When installing a storage tank water heater in the attic or area that where damage results from leaking water, provide an approved safe pan below the water heater not less than 1 ½” in depth, with a minimum ¾” drain to an approved, readily visible location.

**Garage.** Water heaters, either gas or electric, that generate a glow, spark or flame may be installed in a garage if the pilots, burners, or heating elements and switches are elevated at least 18 inches above the floor and must be protected from vehicle damage. Tank water heaters installed on a platform shall require the base to be anchored to the floor. If the water heater installed within a garage is enclosed in a separate, approved compartment that is accessed only from outside of the garage, it may be installed at floor level provided, that the required combustion air is drawn from outside.

**Seismic strapping.** Storage tank water heaters shall be anchored or strapped to resist horizontal displacement due to earthquake motion. Strapping shall be at points within the upper 1/3 and lower 1/3 or its vertical dimension. At the lower point, a minimum distance of four inches shall be maintained above the controls with the strapping. CPC 507.2.

**Temperature and pressure valves.** Storage type water heaters shall be provided with a combination temperature and pressure relief valve (T&P Valve). The piping shall extend from the valve to the outside of the building with the end of the pipe pointing downward, not more than 2 feet nor less than 6 inches above the ground. It is not acceptable to terminate the T&P in the underfloor area.

Tankless water heaters require a pressure-only relief valve installed in accordance with the manufacturer's installation instructions. The manufacturer's installation instructions for the tankless water heater must be at the job site for all inspections.

**Exhaust Vents.** Water heater vents shall be by a listed system installed per current versions of the CPC & CMC codes and the manufacturer's installation instructions. The vent must terminate at least 4 feet from a property line.

**Gas piping.** Tankless water heater require a significantly greater quantity of gas than a storage tank heater. Care must be taken to verify that existing house gas piping is adequately (re)sized for the increased load. Provide gas line sizing calculations at the initial inspection.

### **California Energy Code Requirements**

Prescriptive Energy Efficiency - 2016 Residential Compliance Manual Table 5-4

Tankless - minimum energy factor of 0.82

Tank  $\leq$  55 gallon - minimum energy factor 0.67

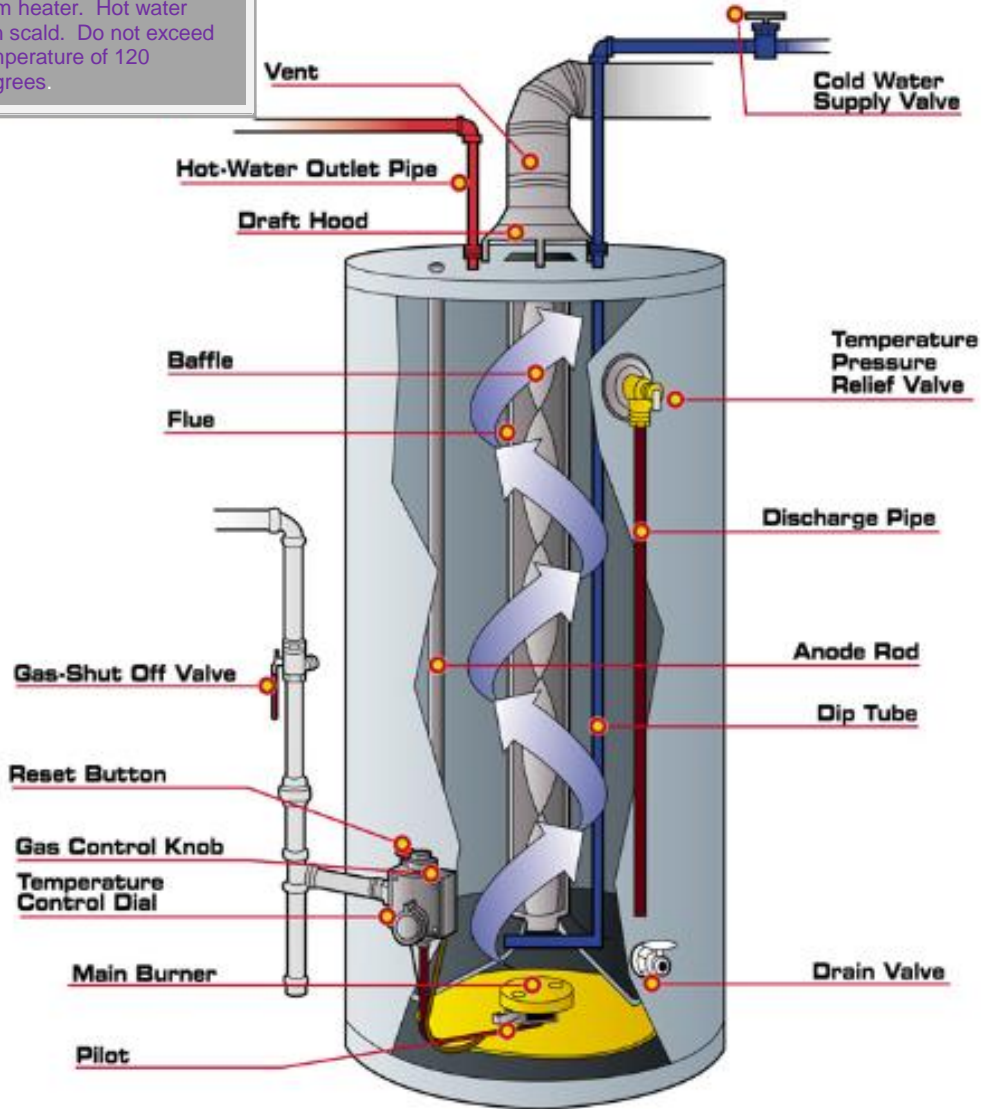
Tank  $>$  55 gallon - minimum energy factor 0.80

Mandatory Pipe Insulation is required for the first 5 feet of hot and cold water pipes from the storage tank or water heater and for all accessible piping with a nominal diameter of  $\frac{3}{4}$  inch or larger.

# WATER HEATER-GAS

## Storage Tank

Warning – Keep flammable liquid and materials away from heater. Hot water can scald. Do not exceed temperature of 120 degrees.



## Tankless Water Heater

