High Efficiency Water Heating Tankless Water Heaters

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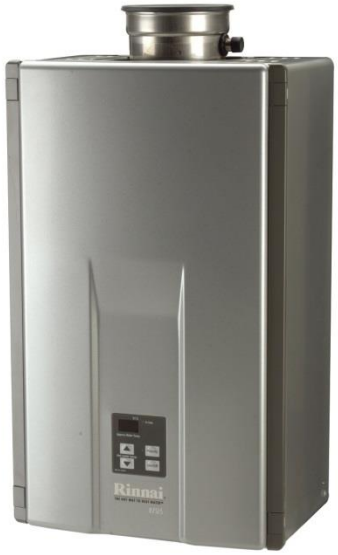
Tankless Water Heaters - Overview

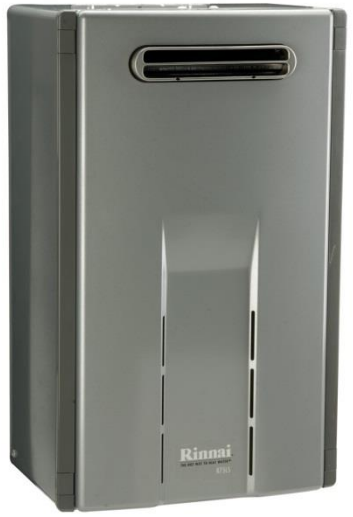
- Tankless (Instantaneous) water heaters are on demand appliances.
  - This means they only heat water when there is a demand from the end user.
- To accomplish “On-Demand” water heating tankless water heaters have much larger burners (or electrical elements) than storage water heaters.
  - Modulating technology allows them to match the work load
- Temperature Priority
  - This means that the water will always be delivered at the setting temperature
    - Even if it has to restrict the amount of water you receive – Tankless water heaters need to be sized correctly.

- Essentially no stored water waiting to be used
  - This nearly eliminate standby losses allowing them to be much more efficient than storage water heaters.
  - 37% energy savings when replacing a standard tank water heater with a tankless – Shoenbauer “Actual Savings and Performance of Natural Gas Tankless Water Heaters” 2010.

Type of Tankless Water Heaters

- Tankless water heaters come in many types
  - Indoor products
    - Direct vent or exhaust only (All power vent type products)
  - Outdoor products
    - Freeze protection down to negative 22F to negative 30F
    - Recess box kits allow them to be flush mounted
  - Sizes for small apartments to whole house units available





Types of Tankless Water Heaters

- Non-Condensing Tankless water heaters (EF=0.82)
  - High efficiency modulating product requires specialty venting (Category III stainless or Concentric Venting)
  - $650 - $900 depending on unit size and features

- Condensing Tankless Water Heaters (EF 0.91 up to 0.95)
  - PVC venting allows easy installation
  - $800 - $1200 depending on unit size and features

Tankless Water Heater Warranties

- Tankless water heaters come with standard warranties higher than standard tanks.

- Heat Exchanger
  - 10 – 15 years

- Parts
  - Typically 5 years

- Labor
  - Typically 1 year

Myths about Tankless

- People will use more water when they have “continuous” hot water from Tankless
  - People no longer have to schedule their hot water use but studies have shown that no significant change in daily hot water use is found after installing tankless
- No hot water with small draws
  - Tankless products can run at flow rates as low as 0.26 GPM and activate at 0.4 GPM.
- Tankless require more maintained
  - Tankless water heaters require the same maintenance as storage tanks (Periodic checks of venting and to ensure the burner is operating correctly.
  - Tankless incorporate “Lime-Scale” detection functions to indicate when the unit should be flushed and will be dependent on water quality.

Market Barriers

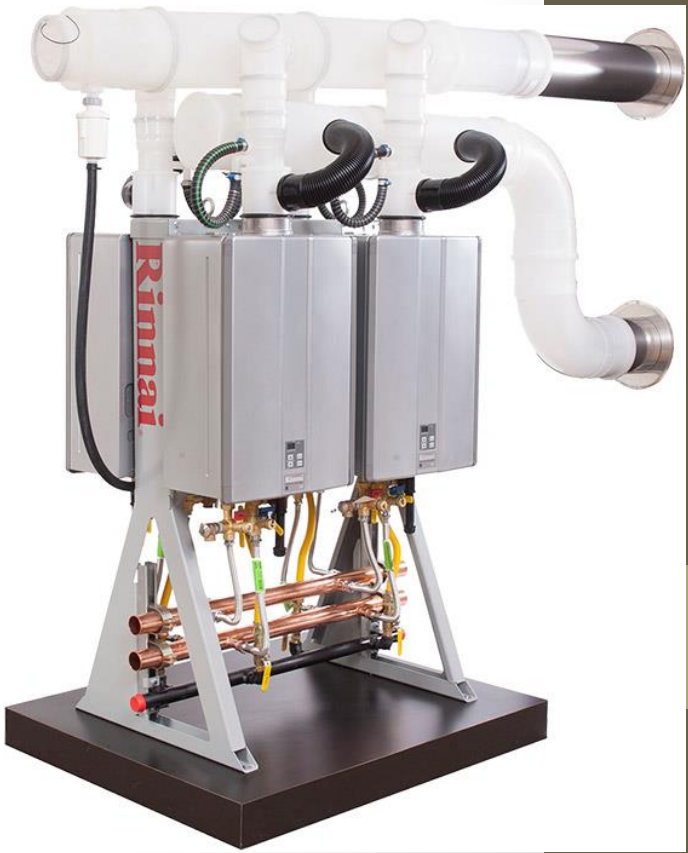
- The 2013 edition of Title 24 has eliminated several of the market barriers by ensuring the installation is prepared for high efficiency water heating products
- These new changes include
  - A 120V electrical receptacle that is within 3 feet from the water
  - A Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed; and
  - A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance, and
  - A gas supply line with a capacity of at least 200,000 Btu/hr.

Market Barriers

- “Cold Water Sandwich”
  - The term "cold water sandwich" effect is used to describe the introduction of cold water into the hot water supply line during frequent on/off operation of an instantaneous hot water heater. When present, this effect appears as a momentary drop in hot water temperature.
  - Several tankless products incorporate “Quick Start” features meaning the tankless will remain in a ready state after a water draw in the event there is another draw which eliminates or reduces the potential affect of cold water sandwich.
- Studies show that people adjust behavior when a tankless is installed to get around this issue.
  - “An average of 28 draws per day was found for homes on the StWH and only 22.5 hot water draws per day were used with the TWH.” Shoenbauer 2010 MNCEE

Tankless Beyond Single Family – Multi-Family Applications

- Tankless Benefits for Central Systems
  - Multiple tankless can be installed in groups to create systems up to 5 million BTU/Hr.
  - These systems are electronically connected and provides a dynamic water heating solution utilizing only the amount of units needed to meet the system demand at that time
  - Modulation range from about 15K BTU/hr to 5 million BTU/hr
  - System controllers will automatically balance run time between units
  - Redundancy – if one unit needs to be serviced it can be isolated while the remaining units service the building.
  - Indoor or Outdoor Installations
  - Common venting



Multi-Family and Tankless

- Tankless benefits for individual units
  - Tankless units come is sizes for small apartments to larger condominiums.
  - Small size makes them easy to incorporate
  - Indoor and outdoor units
  - Direct Vent applications eliminate make-up requirements
  - Vent terminals are small and discreet averaging less than 5-in. in diameter.

DOE / Title 24

- The Department of Energy (DOE) is currently in the process of releasing a new “Method of Test for Rating Residential Water Heaters”
  - This new test method will include:
    - More draws per day – up to 18 draws
    - Small and large draws
    - New draw patterns that better reflect true use in the field
  - Title 24 needs to revisit the penalty they have incorporated for tankless water heaters due to the short comings of the current test procedure and utilize the new ratings in full.

Manufacturer Capacity

- Are there any restrictions that affect water heating decisions for Title 24?
- There are several strong manufacturers positioned to support market growth
- Can we support California?
- YES WE CAN!!

Questions?

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