

Rinnai[®]

TANKLESS WATER HEATERS

Rinnai America Corporation

103 International Drive

Peachtree City, GA 30269

Telephone: (678) 829-1700

Fax: (678) 364-8643

Toll Free: (800) 621-9419

Email: marketing@rinnai.us

Web: www.rinnai.us



Intro to Commercial Tankless Technology

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Purpose and Learning Objectives

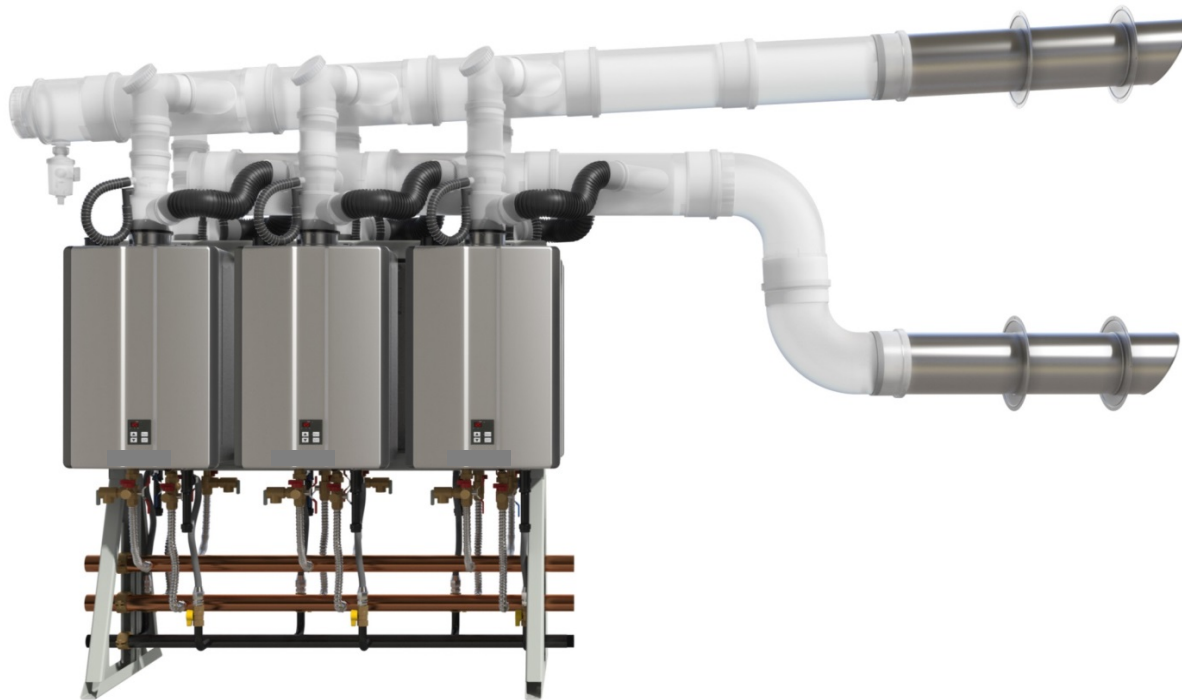
Purpose: To provide an overview of tankless water heating technologies, including the features and functions, the energy and environmental benefits of a tankless system, as well as a discussion of how these benefits can be utilized in Commercial applications.

At the end of this program, participants will be able to:

- explain how a tankless water heater systems are advantageous in replacing a larger or single heat source
- state the benefits of tankless water systems concepts of load tracking and turndown ratio.
- describe the benefits of common venting versus other venting options, and
- Name the top vertical industries served by tankless water heater systems and how they benefit from using this technology versus tanks or boilers.

Commercial Application – Tankless Rack Systems

A single, self contained system consisting of multiple tankless units which replaces one larger heat source. Three key advantages are:



1. Efficiency

2. Reliability

3. Flexibility

Tankless Rack System Efficiency

Load Tracking Through Precise Modulation



13:1 Single Engine Turn Down Ration

System Controller:

Allows Multiple Engines to Communicate
Seamlessly Modulating Firing Rate Based on Demand

**Example: Up To 25 Units Can Communicate:
327:1 Turn Down Ration**

What is turndown ratio?

The description of a gas products ability to modulate its flame and btu delivery

Modulation is defined by Turndown Ration

Turndown Ratio:

A products maximum fuel input divided by its minimum fuel input.

Example: A 1,000,000 btu modulating boiler with a minimum fuel input of 250,000 btu's would have turndown ratio of 4:1

1,000,000 divided by 250,000 = 4:1 Turn Down Ratio

Tankless Rack System Efficiency

2 Engine / 400k BTU : 26:1 TDR

5 Engine / 1m BTU : 65:1 TDR

10 Engine / 2m BTU : 130:1 TDR

25 Engines / 4.9m BTU : 325:1 TDR

Modulating and tracking the load from:

15,900 BTU's to 4.9M BTU's

.26 GPM to 245 GPM

Maintaining Temperatures +/- 2 Degrees

Tankless Rack System Efficiency



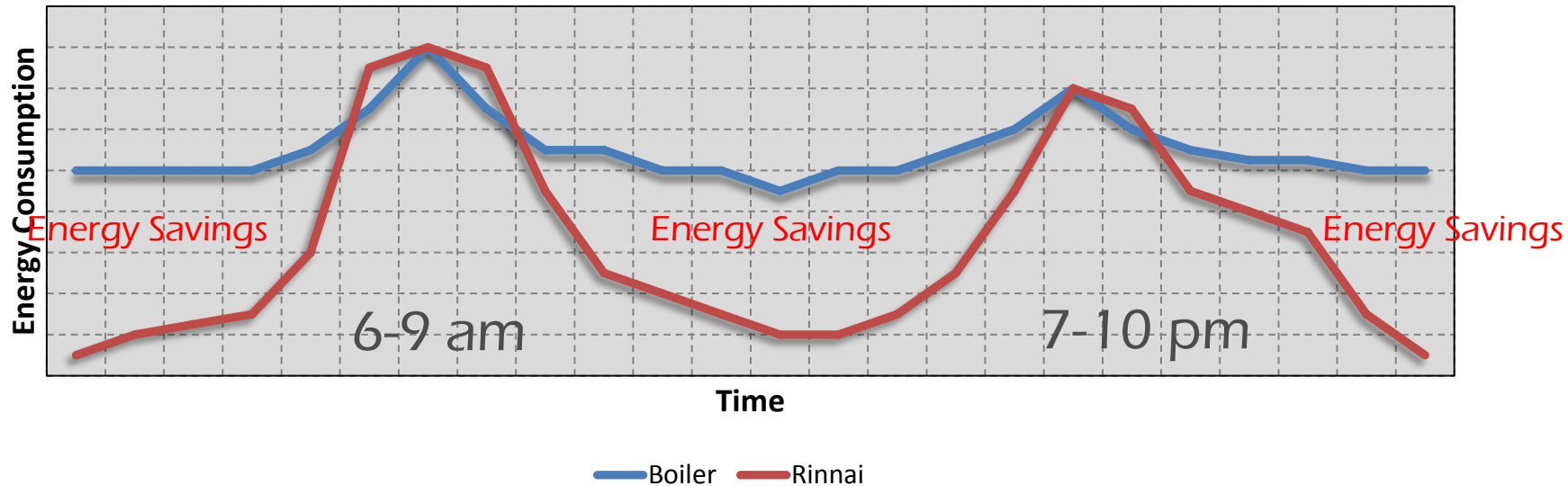
Example: 250 Unit Hotel

Tankless can **Track the Load** from:

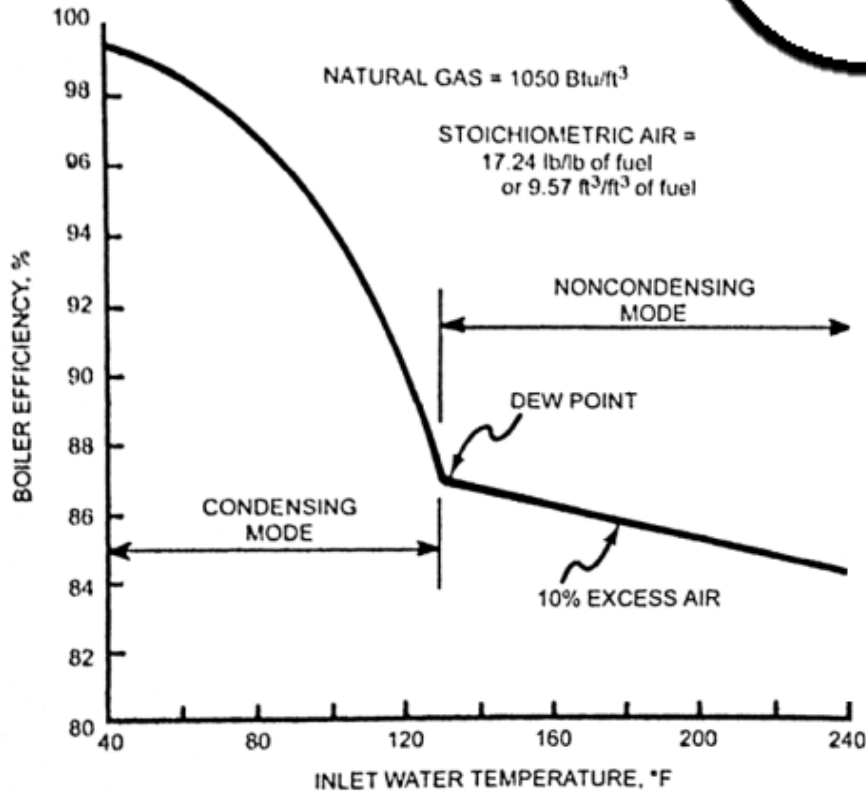
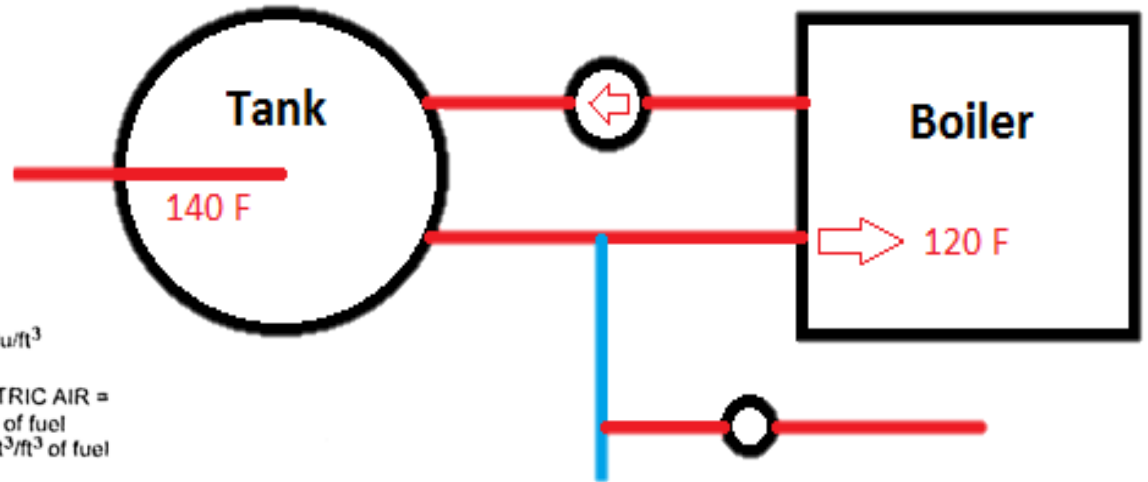
One Fixture

to

The Entire Hotel Under Peak Demand



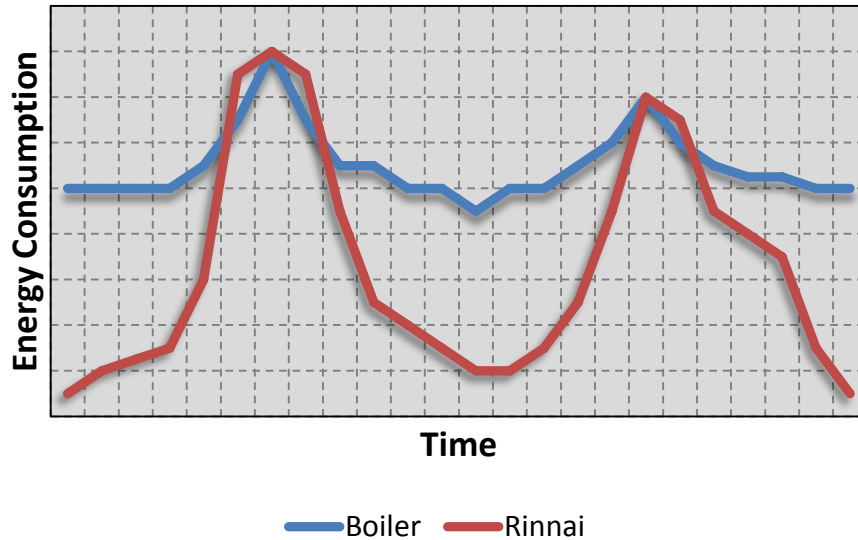
Tankless Rack System Efficiency



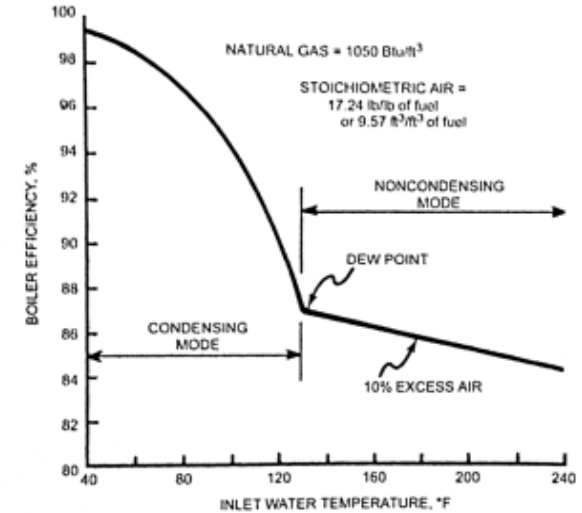
Efficiency is Based on Inlet Temperature

- Boilers / Tanks = **120 F = 85%**
- Tankless Rack = **60 F = 95%**

Tankless Rack System Efficiency



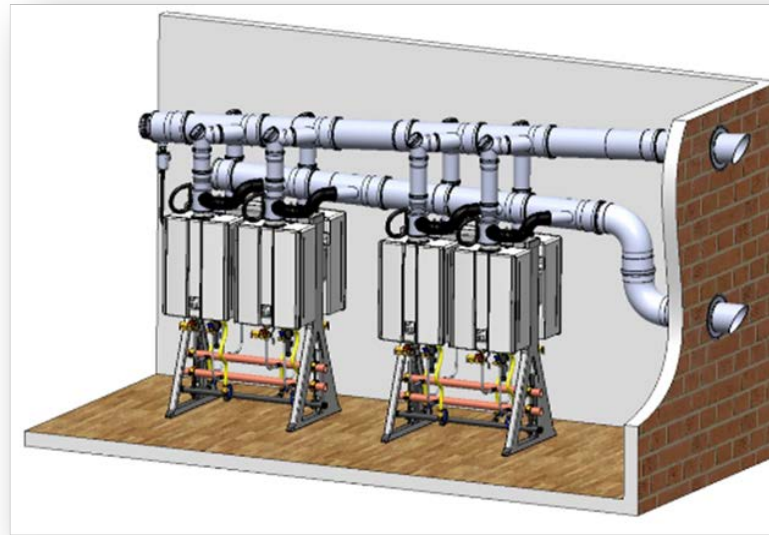
Load Tracking



True Condensing

The Most Efficient Method for Heating High Volumes of Water

Reliability Through Redundancy



**Individual Engines Can Be Taken Off Line With
No Interruption of Hot Water Service**

Tankless Rack Systems Reliability

Example: 1,000,000 btu System



One unit disabled: loss of 16% DHW



**One unit disabled: 50% loss of DHW
Tank disabled: 100% loss of DHW**

Tankless Rack System Reliability

100% Back Up



VS



- **Commercial Application can call for 100% Redundancy**
- **A Typical System will Double the Space needed and the Cost of the product and Installation**
- **Tankless Racks can do this with One Additional Unit**

Typical Controller Logic



- **Run Time is Balanced Among All The Units**
- **Firing Sequence is Rotated Based on Run Time**
- **Evens Wear and Lengthens Overall Lifespan of the System**

Tankless Rack Flexibility



Indoor
Outdoor
Separate
Together
Free Standing
Wall Mounted
Individual Vent
Common Vent



Tankless Rack Flexibility

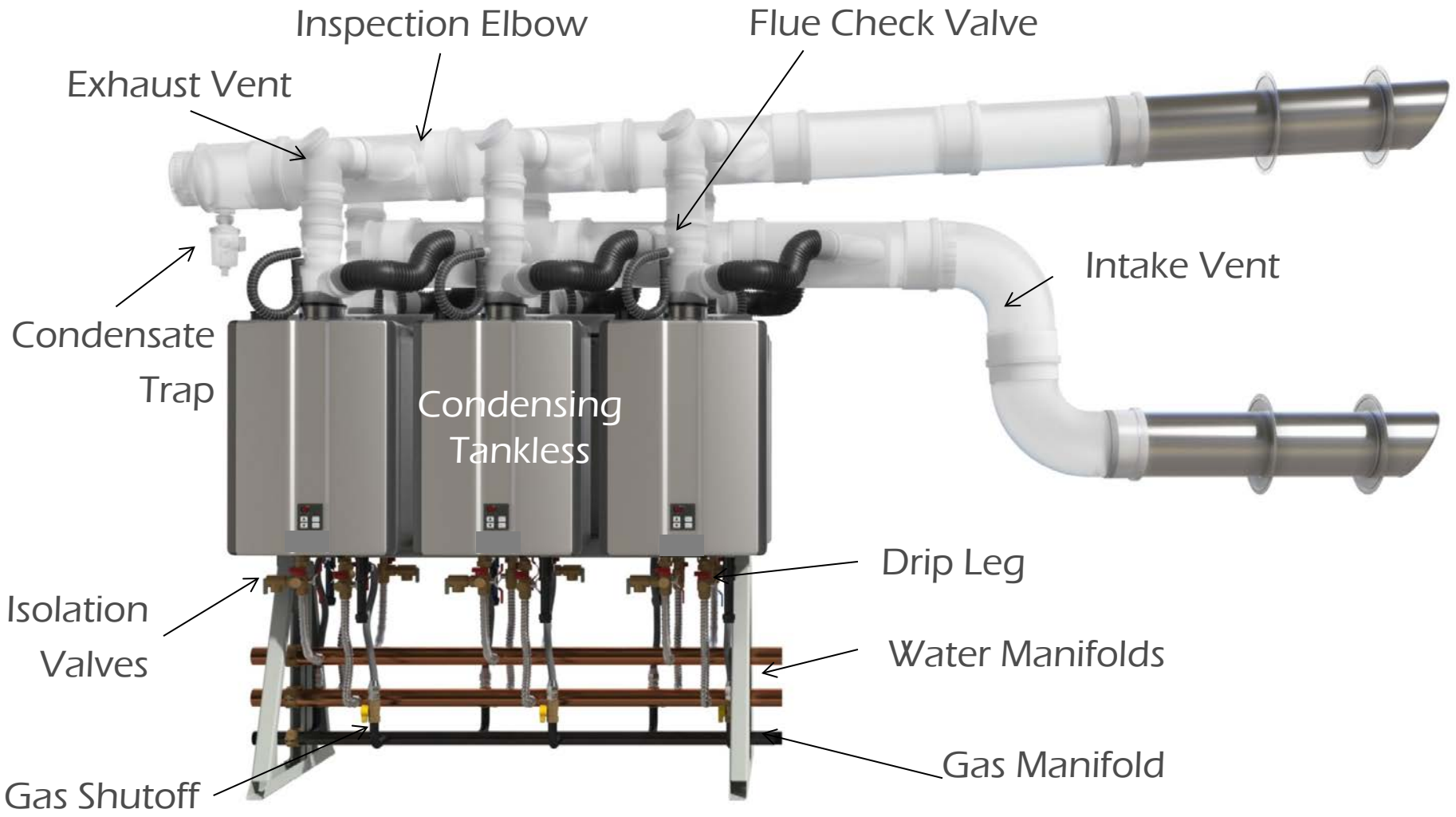
- **Multi-family**
- **Healthcare**
- **Hospitality**
- **Dormitory/University**
- **Food Service**



Applications



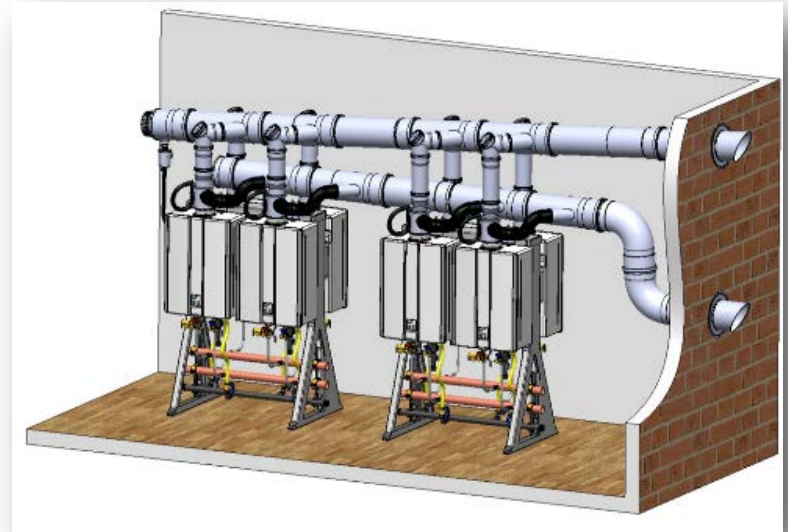
Tankless Rack System with Engineer Vent System



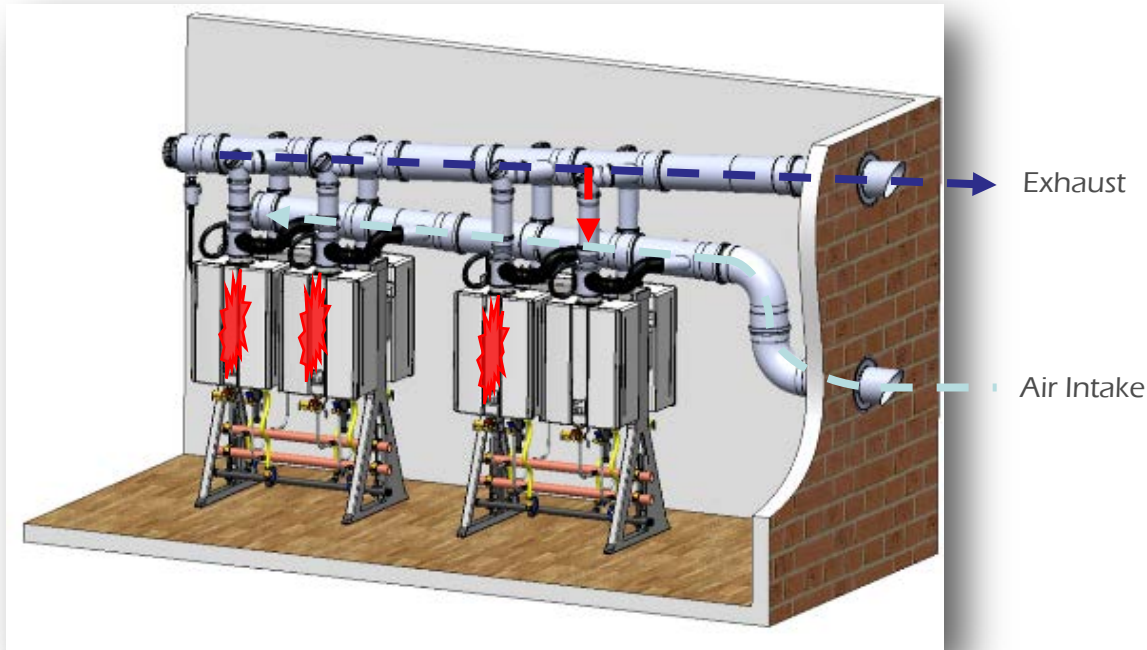
Just add 120Vac power , vent, connect water and gas and your ready for hot water!

Common Vent

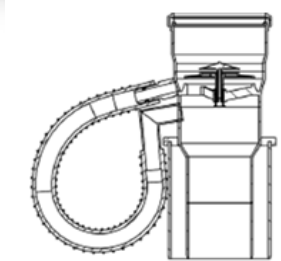
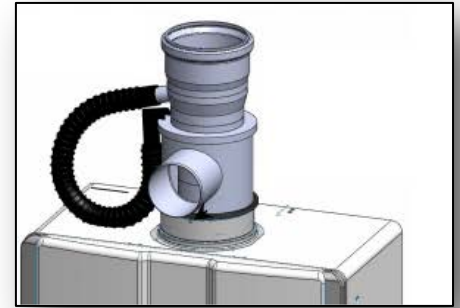
- Available from some manufacturers
- Some common vent headers are push fit designed for easy and quick installation
- Common vent solutions requires only two terminations, reducing the number of penetrations through building exterior
- Common vent solutions are engineered products for maximum safety and efficiency



Common Vent Check Valve



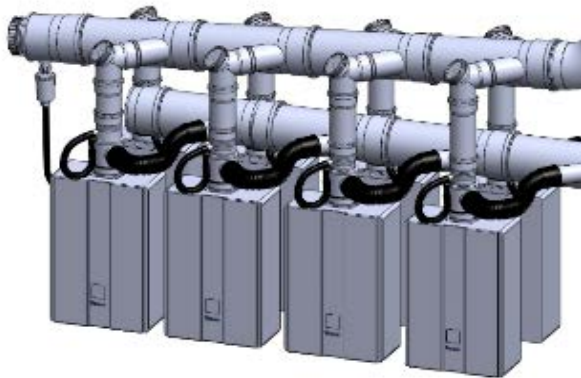
Flue check valve



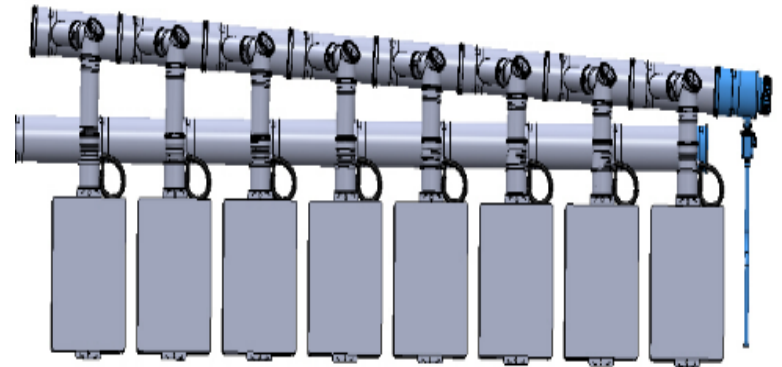
When there is a call for hot water and only three of the eight water heaters fire, a flue check valve eliminates flue gases from entering the water heater cabinet and the building structure. Some are located in the tankless, some use a vent flue check valve adaptors.

Typical Common Vent – Options

Back to Back Configuration

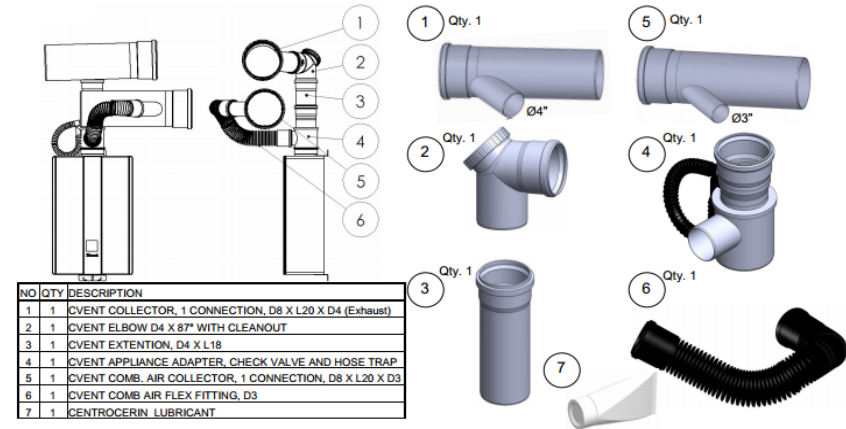
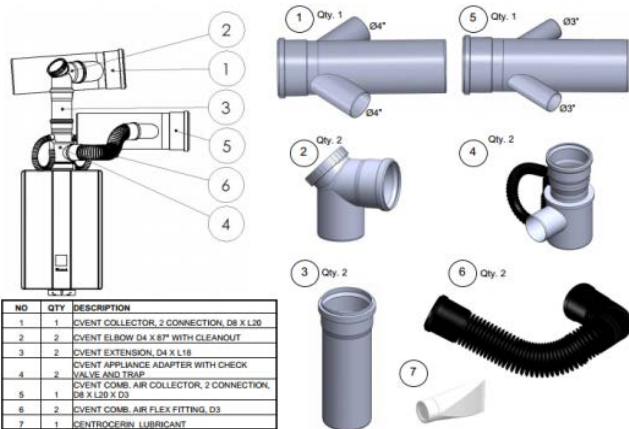
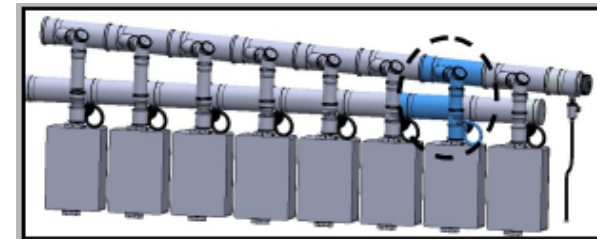
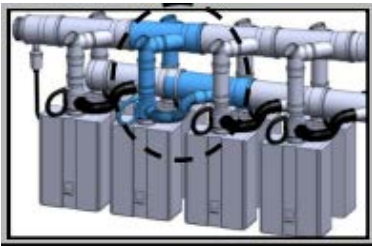


In-line Configuration



Common Vent – Typical Header Kits

Some manufacturers offer a kits that contain all the pieces needed to install a common vent system. Some of the better systems are designed and certified for Tankless rack systems.



Common Vent Comparison

	Advantage	Comments
Material Cost	PVC	PVC has a lower purchase price than PP
Weight	PP	PP is much lighter than PVC, makes it easier to manage
Labor	PP	PP is push fit - no glue or cure time
Availability	PVC	PVC is widely available
Safety / Durability	PP	PP is specifically designed for Tankless and is approved by CSA – Some vent system includes flue check valve to eliminate exhaust backflow
No Code Risk	PP	Vent system is certified to ANSI Z21.10.3 – CSA 4.3
High Altitude	PP	Some are approved for up to 10,200' for Common Vent
Termination Size	PVC / PP	Less terminations are needed - less wall or roof space required
Temperature Rating	PP	PP is rated up to temperatures of 230°F
Integrated Flue Check Valve	PP	PP design incorporates flue check valve to eliminate recirculation of flue back into water heater
Header Kits	PP	Some are pre-cut to make installation much quicker

Commercial Applications

Overview

There are many opportunities in which to use tankless water heaters in commercial applications, including:

- car washes
- hotels and motels
- detention centers
- fitness centers and spas
- schools and daycare facilities
- dormitories/locker rooms
- stadiums
- cafeterias and restaurants
- laundry facilities
- government facilities
- nursing/retirement homes
- churches, and
- industrial facilities.



Summary

- Tankless water heaters are environmentally sound appliances as they produce very low NO_x and CO₂ emissions.
- Components of some tankless systems are replaceable, unlike standard tank water heaters that are typically replaced when they fail or leak.
- Tankless systems offer twice the service life over a standard tank type water heater.
- Tankless systems provide space savings, energy savings, and lower operating costs.
- As part of a green design strategy, specifying tankless systems are a superior solution for a wide range of commercial applications when compared to a tank or a boiler, reducing capital and overall cost of ownership.
- With built-in redundancy, maintenance can be performed while system is operating – eliminating downtime.
- Mounting location flexibility allows engineers and architects better space utilization.

Thank you for your time!

QUESTIONS?

This concludes the educational content of this activity



engineering@rinnai.us

Or

866.383.0707

Evaluation

PART 1: CONTENT

1. Were the program learning objectives stated clearly and concisely? Y P N **(Required)**

Comment _____

2. Did this program meet your expectations? Y P N **(Required)**

Comment _____

3. Are you confident that you could accomplish these learning objectives? **(Required)**

(List learning objective one) Y P N

(List learning objective two) Y P N

(List learning objective three) Y P N

(List learning objective four, etc.) Y P N

4. Did you find the program content current and relevant? Y P N **(Required)**

Comment _____

PART 2: PRESENTER

5. Did the presenter(s) help you understand the content? Y P N **(Required)**

Comment _____

6. Were the audio and visual materials effective? Y P N **(Required)**

Comment _____