



# Commercial High-Efficiency Water Heater Comparison

An A. O. Smith Water Heater White Paper  
Competitive Review of the Rinnai Demand Duo™

## **Selling the A.O. Smith Cyclone® Mxi Against The Rinnai Demand Duo™**

The commercial condensing water heater segment continues to grow as customers seek higher efficiencies for their high demand commercial applications. There are a range of technologies that are now actively marketed for commercial applications. The latest tankless product offering comes from Rinnai and integrates a 199,000 Btu condensing tankless unit bolted to a 119 gallon storage tank. While adding storage is in general a smart choice for commercial tankless applications, there are many questions and some confusion regarding the claimed benefits of the Rinnai Demand Duo.

The demands of the typical commercial application create a differing set of challenges for the tankless based system design. Many of these challenges and issues are applicable to both stand-alone tankless installations as well as the combined systems like the Demand Duo. Let's take a closer look at some things to consider when choosing between a Rinnai Demand Duo and the industry leading A. O. Smith Cyclone.

### **Maintenance**

In speaking with customers who have chosen tankless for their commercial hot water needs the single biggest surprise has been the maintenance required. The integration of storage with the Demand Duo design does not alleviate the required maintenance that is an inherent quality of tankless technology, especially in high flow rate commercial applications. The Rinnai C199 (the tankless heater used in Demand Duo) manual states "The appliance must be inspected annually by a licensed professional". The cost of this annual inspection/service call by a professional plumber should be taken into consideration when comparing total cost of ownership between the Rinnai Demand Duo and the A. O. Smith Cyclone. There are several reasons tankless units require maintenance. The amount of water running through the tankless heat exchanger in a commercial application can vary widely. An independent study conducted by the Food Service Technology Center measured daily hot water usage in excess of 2,100 gallons per day in a typical restaurant. Directly heating this large amount of water in a tankless design results in multiple cycles and wear and tear on components and materials.

### **Water Quality Restrictions**

The Rinnai Demand Duo requires careful consideration of the water quality the water heater will see in normal operation. The manual clearly states in bold print **"Replacement of the heat exchanger due to water quality damage is not covered by the warranty."** There are multiple water quality parameters to consider to ensure your Demand Duo will operate properly. A significant percentage of the United States has water quality that falls outside one or more of the parameters listed in the Rinnai C199 manual. Many customers may not have had a recent water quality test conducted to know if their location is within the required parameters.

## Rinnai Demand Duo Water Quality Restrictions

	Maximum Level
Total Hardness	Up to 200 mg / L
Aluminum *	Up to 0.2 mg / L
Chlorides *	Up to 250 mg / L
Copper *	Up to 1.0 mg / L
Dissolved Carbon Dioxide (CO2)	Up to 15.0 mg / L or PPM
Iron *	Up to 0.3 mg / L
Manganese *	Up to 0.05 mg / L
pH *	6.5 to 8.5
TDS (Total Dissolved Solids) *	Up to 500 mg / L
Zinc *	Up to 5 mg / L

\* Source: Part 143 National Secondary Drinking Water Regulations

### Rinnai Demand Duo Design Complexity

The Demand Duo design consists of a C199 tankless unit, circulating pump, PC board, plumbing hardware and protective plastic pieces. The tankless unit itself is a complex design with a multitude of small mechanical parts, valves, burners and electronic controls. The Demand Duo adds a level of complexity by incorporating a circulation pump, additional PC board, storage tank and plumbing required to connect the tankless unit to the storage tank. This added complexity creates opportunities for leak points, pump maintenance/replacement and PC board failures.

### Warranty

The Rinnai Demand Duo is being marketed with a 6-year heat exchanger and 5-year parts warranty. Here are five key considerations when accessing the value of the Rinnai warranty when compared with the A. O. Smith Cyclone warranty:

- Has the Demand Duo received its annual required maintenance from a licensed professional?
- Are any of the ten water quality restrictions being?
- Has the person installing the Demand Duo attended a Rinnai Installation Training Class? If not, the warranty is void.
- Heat Exchanger warranty coverage is reduced to 3 years when used as a recirculating water heater within a hot water recirculation loop without an incorporated aquastat/thermostat, timer or on demand system.
- The heat exchanger is a repairable part and Rinnai retains the discretion to choose repair or replacement of the part or product.

### Reliability

In the commercial market having the hot water you need in order to conduct business is not an option, it is a requirement. The A.O. Smith Cyclone has a long history as the preferred product for providing reliable and energy efficient hot water. Having been in the market for over twenty years, Cyclone has a proven track record of long lasting reliability. The industry exclusive glass coated helical coil heat exchanger, powered anodes and top fire design all combine to make Cyclone the long lasting “set it and forget it” choice.

## The A.O. Smith Cyclone Mxi Commercial Advantage

**A.O. Smith  
Cyclone® Mxi**



**Rinnai  
Demand Duo™**



Feature			Advantage
Thermal Efficiency	97%	96%	Cyclone Mxi
Recovery @ 100F T	235	231	Cyclone Mxi
Maintenance	Almost None	Annual inspections required for warranty	Cyclone Mxi
Reliability	Over 20 years proven in commercial applications	Limited commercial application	Cyclone Mxi
Standby Loss	AHRI listed 1,000 Btu/hr, Foam insulation	Tank manufactured by Giant in Canada, not AHRI listed, fiberglass insulation	Cyclone Mxi
Space Savings	75-3/4" tall x 27-3/4"	67-3/8" tall x 39-1/8"	Application dependent, depth may be an issue in certain applications
Vent Flexibility	Approved for horizontal power vent and direct vent on different plane	Not approved for horizontal power vent or direct vent on different plane, power vent requires adapter	Cyclone Mxi
Controls	Large LCD with advanced diagnostics in plain English	LED with basic diagnostic codes	Cyclone Mxi
Installation	Standard 1-1/2" plumbing, gas and vent connection locations for replacement ease	Non-standard 2" plumbing, gas and vent connection locations	Cyclone Mxi
Water Quality Warranty Restrictions	None	10 water quality parameters must be met for valid warranty	Cyclone Mxi
Warranty	3 year standard tank, 5 year optional; 1 year parts	*6 year heat exchanger/tank, 5 year parts	*Warranty restrictions may negate perceived Rinnai advantage
Cost of Ownership	Competitive equipment pricing and limited to no maintenance required	Competitive equipment pricing, annual required maintenance expense	Cyclone Mxi

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