Innovation

Commercial Tankless Water Heaters

AERCO.com
AERCO’s Innovation is the only commercial-size tankless water heater that provides hot water on demand without the need for any significant storage volume to buffer load change and provide stable hot water temperatures. Due to its unique tankless design, the Innovation has the smallest footprint of any commercial size application. It’s easy to install, simple to service, and cost effective (eliminating the need for expensive storage tanks, mixing valves and tank circulators).

**Key Features and Benefits**

- 3x warranty protection vs. the competition
- Low operating, maintenance and installation costs
- Up to 96-99% efficiency with set points of 120°F or below
- Long-lasting and highly reliable stainless steel helical firetube heat exchanger is thermal shockproof and scale resistant
- Compact footprint creates more available space
- Easy installation and venting versatility; direct/conventional venting with PVC, CPVC, Polypropylene or AL29-4C materials
- Precise temperature control ±2.2°C due to dynamic feed-forward sensing and unmatched turndown (up to 30:1)
- Low NOx and low CO emissions
- 1/3 the standby losses compared to conventional tank-type heaters
- Able to daisy-chain multiple units for applications over 293 kW
- Eliminates need for mixing valves, tank circulators, storage tanks
- Available sizes: 176, 234, 311, 396 kW

**State-of-the-Art Technology**

Innovation water heaters utilize state-of-the-art technology to easily meet highly diverse, demanding commercial and industrial hot water requirements in a compact and reliable condensing design. Its durable, high-efficient, helical wound firetube heat exchanger is time-tested to be impervious to thermal stress for extended life. Enhanced waterside flow distribution maintains constant minimum velocities above 4 ft/sec across the heat exchanger. This keeps solids in suspension and greatly reduces scale dropout to maintain high efficiency and long life. The all stainless steel construction maximizes longevity in the condensing application and won’t need fireside cleaning. The corrugated tubes increase effective heat transfer surface area for optimal thermal efficiencies up to 99%.
The Benefits of Tankless Water Heaters

Tankless water heating systems help deliver the best possible ROI compared to their typical storage tank counterparts. Not only do they lower costs on installation and operation, but they save a tremendous amount of space for the facility (due to the elimination of big, storage tanks and ability to use common venting), provide a safer environment for customers, and outlive tanked competitors by 10–15 years.

**Lower Installation, Maintenance and Operational Costs**

Venting is one of the most expensive installation items. AERCO’s Innovation allows for common venting with different sized units, as well as in combination with Benchmark boilers. This can significantly reduce the number of vent runs and wall/roof penetrations, which lowers overall installation costs. Costs are lowered further because there’s no need to purchase expensive storage tanks, circulators, and mixing valves. Operational costs are similarly decreased due to high efficiency (typically 96–99%), high turndown and reduced standby losses. With no need for hot water storage, less fuel is burned thereby increasing energy savings.

**Space-Saving Design**

The Innovation is delivered as a single, fully assembled unit. Its small, doorway-sized footprint and quiet operation make it ideal for both new construction and retrofit applications. The unit’s compact size allows it to be easily moved in and out of a mechanical room whether it’s located in a cramped basement or in the penthouse of a 25-story building, eliminating the costs of tearing down walls or hoisting via helicopter. More available room can be used to generate income instead of unnecessarily storing water.

**The Safer Water Heater**

Stored water in a tank must be maintained at a hot temperature of 60°C in order to prevent Legionella bacteria, which means the water needs to be heated up only to be cooled down for consumption. However, the tankless design of the Innovation water heaters allows the system to operate with set point of 51°C – saving energy and reducing the risk of scalding while eliminating the need for costly mixing valves. Because water volume is kept to a minimum and continuous circulation is maintained through the Innovation, the risk of Legionella bacteria growth is virtually eliminated.

**Longer Life Cycle**

With a life of more than 20 years, the Innovation lasts two to three times longer than a tanked heating system, which typically needs to be replaced every eight to 10 years because storage tanks can be prone to rust, system failure and water damage.
Dynamic Load Anticipator
Further improving the efficiency of Innovation is AERCO’s Dynamic Load Anticipator, an advanced control system that helps maintain precise modulation of the high turndown air/fuel delivery system. Field-proven for more than 60 years, dynamic feed-forward and feed-back sensors monitor inlet flow via the proportional change in mixed temperatures due to variations in the flow. The system’s controls fire the unit to accurately match load requirements and produce tight ±2.2°C outlet temperature control.

High Turndown Air/Fuel Valve Delivery System
Innovation’s high turndown air/fuel delivery system consists of AERCO’s patented fully modulating air/fuel valve, VFD driven premix blower, and fiber mesh radiant burner. The system guarantees safe, stable, reliable and efficient combustion with the lowest NOx and CO emissions, as well as eliminates wasted fuel and reduces operating costs, making Innovation the smart choice for “green” designs.
AERCO’s Innovation features the C-More Control System which combines temperature and operating controls, combustion safeguards and fault enunciator functions ensuring fail-safe heater operation if the external building controls fail.

Additionally AERCO’s Water Heater Management system (WHM) comes standard on-board all C-More controls. WHM is designed to efficiently sequence up to eight water heaters on the same system to meet load requirements and ensure all water heaters in the system operate at maximum efficiency. It monitors the fire rate of all water heater sequences by opening or closing the motorized valve, as required, to meet hot water demand.

The result is the most energy-efficient and reliable water heating system design available. Only those units required to meet load are operating. Units in standby do not needlessly cycle to maintain set point – reducing system standby losses and unit wear to the bare minimum. Compared to a conventional storage system which requires 475 liters of storage for every 150 kW input, an Innovation system truly provides reliable domestic hot water on demand in the smallest possible energy footprint. All of which significantly reduces maintenance and operating costs, while increasing ROI.

Benefits:
- Optimizes operating efficiencies at all load conditions
- Virtually eliminates standby losses
- Increases system reliability through reduced cycling
- Accurately tracks daily domestic hot water demands
Sample Installations

**School District, Denver, Colorado**
A Denver, CO school district operates 61 schools with more than 50,000 students. One of the district’s middle schools relied on an out-of-date storage tank-style water heater that suddenly failed, leaving the school without hot water. Since class was in session, the district needed to replace the unit immediately. The district’s Plumbing Department was familiar with AERCO’s products, having used the Benchmark series for several years in its other facilities. They were knowledgeable of and impressed by the Innovation series water heaters and were interested in using them. The department contacted Taft Engineering to ask if an Innovation could solve its critical, no-hot-water problem. Taft’s experts recommended the Innovation 600. The district’s Plumbing Department was able to pick up and install the Innovation 600 unit within 24 hours. Taft dispatched a technician immediately to train the school’s maintenance personnel in the Innovation’s use, and they were up to speed within hours. In a time of ever-tightening school budgets, the district replaced a decade-old unit with one that’s highly reliable energy-saving and extremely efficient.

**Convention Center Hotel San Diego, California**
When the north tower of this major convention center hotel was built in 1984, its 681 rooms and 25 floors got their hot water from two 880 kW copper fin water heaters and a massive 26,500 liters tank. After 15 years, the tank was severely leaking, replaced with two gas-fired 821 kW, 5,680 liters storage tank heaters. The retrofit required a crane to haul the oversized units to the 26th floor mechanical room. Within only a few years, the tank heat exchangers failed, and the hotel was forced to rely on its old copper fins. By 2012, both tanks were leaking, supplied by 30-year-old, 80% efficient heaters. An engineering firm and The Dawson Company recommended the hotel replace its old system with six AERCO Innovation 1060 MBH fire-tube water heaters. The hotel now enjoys up to 96% efficiency and there’s no need to store 11,360 liters anymore, thanks to the Innovations’ tankless technology. The hotel recently hosted a large convention—putting the facility at peak occupancy. onAER showed that no more than three units were required to handle the sustained peak load during the entire four days of the convention.

**Hospital, Colorado**
A Colorado hospital’s 16,260 m² facility, offers a wide range of expert pediatric care including urgent, outpatient specialty, inpatient and surgical, as well as the latest imaging and diagnostic technology. Instead of an old-fashioned, large, central steam plant, the hospital wanted an innovative, decentralized system to supply its state-of-the-art facility. Very few direct-fired tankless water heaters on the market are large enough to meet many hospitals’ domestic water heating needs, but a head plumbing engineer on the project had used AERCO tankless water heaters for years. He chose to install five AERCO Innovation 1350s. With up to 97% efficiency, tankless design and onboard Water Heater Management (WHM) systems, Innovation 1350s were exactly what this hospital needed. The Innovation 1350s reliably meet the high load diversity and critical capacity requirements of this flagship hospital—which expects to treat 80,000 patients annually.
Sample Installations

**Governor’s Mansion**
The Governor’s Mansion is a three floor, 30-room, Greek Revival-style home built in 1967. The space and domestic water heating were provided by a combination system consisting of two natural gas-fired steam boilers that fed heat exchangers for space heating, a swimming pool, and a U-tube heat exchanger inside a 1,893 liters storage tank for domestic water heating. The building was designed for high efficiency, incorporating a water source heat pump loop for space heating—so low inlet water temperatures and condensing equipment was a given. However, the current plans for the building called for three 733 kWh water-tube boilers to provide supplemental heating for the loop, along with two 454 liters tanks for domestic water heating. This meant a more expensive installation, high horsepower pumps and larger piping, valves, and fittings, along with a pricey induced draft fan. AERCO’s fire-tube condensing water heaters and boilers didn’t have the limitations of the current specified water-tube system. Three Innovation 1060s along with three Benchmark boilers were installed at the heating plant. The luxury high rise now utilizes a much more energy and space efficient system, with substantially lower installation costs and electrical operating requirements.

**Professional Hockey Arena, New York**
A professional hockey arena had a serious hot water problem. The facility’s system, two copper fin heaters rated for 600 kWh, 81% efficiency, and feeding a 1,500-gallon storage tank, typically fell completely short during peak times in the arena... most often, 20 minutes before a game, when concession stands were preparing food, and 20 minutes after the game, when stands were cleaning up and players were showering. The wanted to “never run out of hot water again”. To achieve this goal, R.P. Fedder recommended six AERCO Innovation 1060s. Which delivered the perfect combination of performance and economy—up to 96% efficiency, tankless design, a small footprint, zero-side clearance installation and flexible venting. The project was on budget and installed easily. And with more than enough hot water for everyone, every time, there hasn’t been a single complaint since.

**High Rise Apartment Building, New York City**
A 12-story luxury rental residential building overlooking midtown Manhattan features 199 units in a mix of studios and one-, two- and three-bedroom apartments in addition to a state-of-the-art fitness center, gaming lounge, and clubroom. The building was designed for high efficiency, incorporating a water source heat pump loop for space heating—so low inlet water temperatures and condensing equipment was a given. However, the current plans for the building called for three 733 kWh water-tube boilers to provide supplemental heating for the loop, along with two 454 liters tanks for domestic water heating. This meant a more expensive installation, high horsepower pumps and larger piping, valves, and fittings, along with a pricey induced draft fan. AERCO’s fire-tube condensing water heaters and boilers didn’t have the limitations of the current specified water-tube system. Three Innovation 1060s along with three Benchmark boilers were installed at the heating plant. The luxury high rise now utilizes a much more energy and space efficient system, with substantially lower installation costs and electrical operating requirements.

**Multifamily Housing**

**Sports Arena**

**Government**
High efficiency Innovation water heaters are perfect for green building designs satisfying stringent requirements associated with environmentally-conscious facilities, and helping to facilitate LEED certifications.

**Designed for Green Building (LEED credits)**

- Site Development (maximize open space): compact footprint with flexible venting
- Water Efficient Landscaping: condensate can be recovered (neutralization required) and used for irrigation or other gray water applications
- Optimize Energy Performance: maximizes operating efficiency through Water Heater Management and high turndown (virtually eliminating standby losses)
- Low Emitting Materials (Paints and Coatings): uses corrosion and oxidation preventing paints, Green Seal Standard GS-03 compliant, Volatile Organic Compounds
- Indoor Chemical and Pollutant Source Control: sealed combustion capability eliminates the need for louvers or damper systems that can potentially bring chemicals/pollutants from outside
- Innovation in Design: tankless, compact footprint and turndown minimize cycling

**Reduced Energy Consumption**
The Innovation is constantly condensing (heating cold inlet water vs recovering hot water from a storage tank) and uses less electrical power (no circulator pumps).

**Premixed, SS Fiber Mesh Burners**
High-efficiency combustion and low pollutant levels of less than 20 ppm NOx.

**Low Vent Temperature**
Modest venting temperatures allow units to be common vented using eco-friendly PolyPro.
A Guaranteed Way to Size Your Water Heaters

The newly designed, user-friendly and intuitive HeatSmart tool is a practical and financially viable alternative to measuring and monitoring flow for months to determine the design load conditions for optimum water heater sizing. AERCO HeatSmart is built upon 70 years of experience and empirical data from sizing and selecting instantaneous domestic water heaters across a variety of commercial building applications. Additionally, through its remote monitoring system, AERCO has visibility to numerous demand profiles for a variety of applications which allows HeatSmart generates a much more realistic and economic selection proven to satisfy the specified load of your project without the excessive oversizing prevalent with most industry-standard sizing methods. By not oversizing your water heater, you’ll save energy, optimize your system and increase ROI. It also provides a peace of mind by assuring the AERCO generated sizing will meet the design load.

AERCO is the only manufacturer to guarantee its selection will satisfy the building design load provided the real design conditions and accurate fixture count have been entered to generate the sizing. The guarantee covers material and labor charges necessary to correct the system capacity issue.

The comprehensive tool gives you a high degree of flexibility during sizing and selection process allowing you to:

- Size a system using building fixture count or input GPM
- Size a single system with multiple applications (e.g., a resort with multiple full service restaurants)
- Size multiple systems (or zones) within a single building
- Size multiple systems (or zones) within a single building, with multiple applications
- Size a campus with multiple building with multiples zones and/or multiple applications
- As an option, incorporate storage tanks into the design
- Calculate and incorporate the stored water volume within the piping
- Add desirable spare or redundant capacities
- Review previous sizing reports ran with or without sizing guarantee

Every sizing will generate a PDF of the selection report for print or download. You can access HeatSmart at heatsmart.aerco.com.

The guaranteed HeatSmart sizing will ensure the best-sized gas-fired water heater for your project!
**Venting and Installation Advantages**

**Venting Versatility**
The Innovation provides a number of venting options including sidewall, through-the-roof, and sealed combustion capabilities (direct-vent). It’s also approved for venting with PVC, CPVC, Polypropylene, or AL29-4C materials.

**Engineering Support**
Customers can also leverage the vast experience of AERCO engineers who have devoted their careers to developing cost- and space-saving solutions. Standard services available include:

- AERCO engineers work with manufacturers to verify vent sizing/design for enhanced reliability
- AutoCAD drawings
- Submittal information
- Customer service

**Vent Configurations**

- Common vertical vent/room air
- Common vertical vent/individual vertical air
- Common vertical vent/individual sidewall air
- Individual sidewall vent/common sidewall air
## Specifications and Dimensions

<table>
<thead>
<tr>
<th>INN 600</th>
<th>INN 800</th>
<th>INN 1060</th>
<th>INN 1350</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adjustable Temp. Control</strong></td>
<td>10°C to 88°C</td>
<td>10°C to 88°C</td>
<td>10°C to 88°C</td>
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<tr>
<td><strong>Ambient Temperature</strong></td>
<td>-18°C to 54°C</td>
<td>-18°C to 54°C</td>
<td>-18°C to 54°C</td>
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<tr>
<td><strong>Accuracy</strong></td>
<td>+/-2.2°C</td>
<td>+/-2.2°C</td>
<td>+/-2.2°C</td>
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<tr>
<td><strong>Input (kW)</strong></td>
<td>176</td>
<td>234</td>
<td>311</td>
</tr>
<tr>
<td><strong>Net Output (kW)</strong></td>
<td>162</td>
<td>216</td>
<td>286</td>
</tr>
<tr>
<td><strong>Turndown Ratio (up to)</strong></td>
<td>14:1</td>
<td>18:1</td>
<td>21:1</td>
</tr>
<tr>
<td><strong>Flue and Air Intake Diameter</strong></td>
<td>101.6 mm</td>
<td>152.4 mm</td>
<td>152.4 mm</td>
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<tr>
<td><strong>Flue Material (per local code)</strong></td>
<td>PVC, CPVC, PP or AL29-4C</td>
<td>PVC, CPVC, PP or AL29-4C</td>
<td>PVC, CPVC, PP or AL29-4C</td>
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<tr>
<td><strong>Water Inlet &amp; Outlet</strong></td>
<td>2” MNPT (50.8 mm NPT Male)</td>
<td>2” MNPT (50.8 mm NPT Male)</td>
<td>2” MNPT (50.8 mm NPT Male)</td>
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<td><strong>Gas Connection - Natural Gas</strong></td>
<td>1” MNPT (25.4 mm NPT Male)</td>
<td>1” MNPT (25.4 mm NPT Male)</td>
<td>1” MNPT (25.4 mm NPT Male)</td>
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<td><strong>Gas Connection - Propane</strong></td>
<td>1/2” NPT Male (12.7 mm NPT Male)</td>
<td>1/2” NPT Male (12.7 mm NPT Male)</td>
<td>3/4” NPT Male (19.05 mm NPT Male)</td>
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<tr>
<td><strong>Gas Pressure Requirements [Nat. Gas]</strong></td>
<td>Minimum 10.0 mbar (1.0 kPa) @ Full Load</td>
<td>Minimum 10.0 mbar (1.0 kPa) @ Full Load</td>
<td>Minimum 10.0 mbar (1.0 kPa) @ Full Load</td>
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<tr>
<td><strong>Gas Pressure Requirements [Propane]</strong></td>
<td>Minimum 14.9 mbar (1.5 kPa) @ Full Load</td>
<td>Minimum 14.9 mbar (1.5 kPa) @ Full Load</td>
<td>Minimum 14.9 mbar (1.5 kPa) @ Full Load</td>
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<tr>
<td><strong>Maximum Continuous Water Flow</strong></td>
<td>3.15 LPS</td>
<td>3.15 LPS</td>
<td>3.15 LPS</td>
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<tr>
<td><strong>Condensate Connection</strong></td>
<td>¾” FNPT (19.05 mm NPT Female)</td>
<td>¾” FNPT (19.05 mm NPT Female)</td>
<td>¾” FNPT (19.05 mm NPT Female)</td>
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<tr>
<td><strong>Maximum Condensate Flow</strong></td>
<td>17 LPH</td>
<td>23 LPH</td>
<td>30 LPH</td>
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<tr>
<td><strong>Pressure Rating</strong></td>
<td>11 bar (1100 kPa) @ 99°C</td>
<td>11 bar (1100 kPa) @ 99°C</td>
<td>11 bar (1100 kPa) @ 99°C</td>
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<td><strong>NOx Emissions Certifications</strong></td>
<td>SCMAQMD, TCEQ</td>
<td>SCMAQMD, TCEQ</td>
<td>SCMAQMD, TCEQ</td>
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<td><strong>Standard Listing &amp; Approvals</strong></td>
<td>UL, CUL, ASME (HLW)</td>
<td>UL, CUL, ASME (HLW)</td>
<td>UL, CUL, ASME (HLW)</td>
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<td><strong>Gas Train Options</strong></td>
<td>FM Compliant or Factory Installed, Double Block and Bleed</td>
<td>FM Compliant or Factory Installed, Double Block and Bleed</td>
<td>FM Compliant or Factory Installed, Double Block and Bleed</td>
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<td><strong>Electrical Requirements</strong></td>
<td>220 VAC, Single Phase, 50/60 Hz - 15A Breaker (8 FLA)</td>
<td>220 VAC, Single Phase, 50/60 Hz - 15A Breaker (8 FLA)</td>
<td>220 VAC, Single Phase, 50/60 Hz - 15A Breaker (8 FLA)</td>
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<tr>
<td><strong>Water Pressure Drop @ 0.95 LPS</strong></td>
<td>86.2 mbar (8.6 kPa)</td>
<td>86.2 mbar (8.6 kPa)</td>
<td>86.2 mbar (8.6 kPa)</td>
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<td><strong>Water Pressure Drop @ 1.89 LPS</strong></td>
<td>137.9 mbar (13.8 kPa)</td>
<td>137.9 mbar (13.8 kPa)</td>
<td>137.9 mbar (13.8 kPa)</td>
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<td><strong>Water Volume [Liters]</strong></td>
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<td>95.8</td>
<td>83.3</td>
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<td><strong>Weight, Installed (kg)</strong></td>
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<td>445 (dry), 545 (wet)</td>
<td>454 (dry), 540 (wet)</td>
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<td><strong>Weight, Shipping (kg)</strong></td>
<td>490</td>
<td>490</td>
<td>483</td>
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### Innovation

| 600/ 800/ 1060/ 1350 | 129.54 cm | 71.12 cm | 193.04 cm |

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