

SmartPlate

Water Heaters

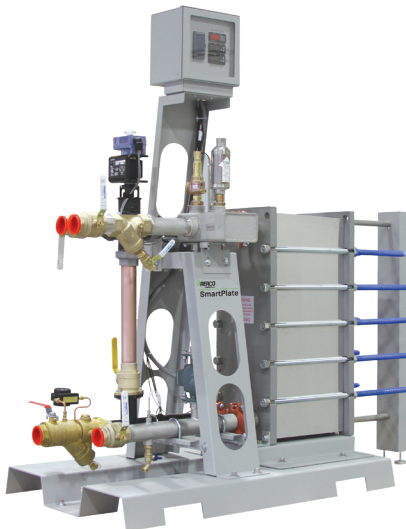


An Advanced Approach to Water-to-Water Heating

AERCO has revolutionized the concept of brazed plate, and plate and frame potable water heating with the SmartPlate line of single- and double-wall water heaters. SmartPlate water heaters are specifically engineered to complement today's condensing boilers in low temperature applications to promote system-wide energy efficiency. And unlike competitive products, SmartPlate heaters incorporate special features and ancillary components that set a new standard for fully-packaged, turn-key solutions. Easily installed in any combination space/DHW heating system, you can count on SmartPlate heaters to maintain accurate temperature control under diversified loads without the need for storage tanks.

Key Features

- Accurate temperature control
- Maximizes energy efficiency
- Advanced electronic controls
- Integrated safety shut-off system
- Easy to install and maintain
- Long-lasting durability
- Fully packaged solution
- Ships fully assembled
- Compact <1 m² footprint
- Supports 2-way and 3-way applications
- Single- and double-wall configurations
- 1379 kPa DHW operation and 121°C boiler water



Precise Temperature Control

Sensors located at the potable water inlet and outlet provide feed forward and feedback temperature signals to SmartPlate's PID controller and fast acting electronic control valve to deliver accurate temperature control under diversified loads without storage tanks or blending valves.

- $\pm 1.1^{\circ}\text{C}$ under steady state conditions
- $\pm 2.2^{\circ}\text{C}$ under normal load changes
- $\pm 4.4^{\circ}\text{C}$ from NO load to FULL load
- Return to set point with 30 seconds
- Full open to full close in 2 seconds
- Integrated "fail safe" safety shut-off system
- No blending/mixing valves or storage tanks required

AERCO's state-of-the-art electronic controller can be remotely monitored and/or fully integrated with BAS software via Modbus communications protocol to control and/or poll important operating parameters of the heater including operating set point, outlet temperature, peak temperature, average temperature, low temperature and more. Operating parameters for the heater are entered directly to the digital controller – just "set and go." Importantly, SmartPlate heaters incorporate a safety shut-off system that operates independently of the unit controller in the event of an over-temperature condition or power loss at the facility.



Sample Installations



Apartment Complex Installation, Weymouth, MA

Located 15 miles from Boston, Weymouth Commons is a luxury condominium complex that requires hot water systems to serve 563 units, as well as a state-of-the-art fitness center and business office. When the original systems were reaching end-of-life, Gary Saltmarsh, the director of maintenance operations, sought a more efficient condensing system that would decrease heating costs and provide reliable hot water for tenants. A system was designed for each building that featured one Modulex EXT paired with a buffer tank and SmartPlate to provide both space heating and domestic hot water. The AERCO MLX units were selected because of their high efficiency of up to 99% and high turndown. “The AERCO solution was exactly what I needed to maximize my condensing usage. The turndown ratio and redundancy of the Modulex was a good selling point. “We have been able to increase the amount of time spent condensing and decrease heating costs,” said Saltmarsh. “I can safely say we are seeing 20%-30% savings. The added benefits of resident comfort, safety, and ease of maintenance are priceless.”



Luxury Hotel at Capitol Hill, Washington D.C.

An 838-room luxury hotel at Capitol Hill in Washington D.C. needed to upgrade its nearly 40-year-old heat and hot water system that was operating at only 50-60% efficiency. The hotel’s projected annual natural gas cost was approximately \$383,000, of which 80% was attributed to the old boilers. Plus, there was an additional \$29,000 spent each year on system maintenance. AERCO provided the hotel with a highly reliable combination system comprised of nine Benchmark 3000 high-efficiency boilers for space heating and three SmartPlate DW113 double wall water heaters for domestic hot water. SmartPlates utilize boiler water as little as 5°F above the required potable water temperature to minimize radiation losses and maximize boiler efficiency. Within the first year of operation, the hotel reduced fuel bill by 26% (more than \$73,000) as well as annual maintenance costs by 65%. With annual savings of more than \$100,000 and greater reliability, and ROI is expected in less than three years.



Boarding School, Dedham, MA

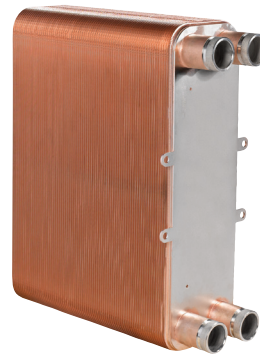
Located just south of Boston, MA, a private boarding school requires water heating system to supply hot water to two fully equipped locker rooms in its ice hockey rink and to fill the 150-gallon ice resurfer with hot water. The original 500-gallon water heater began to fail sending rust and dirt into the facilities’ ice resurfer causing the ice to become dirty and full of debris. Emcor Services and Emerson Swan specified and installed a SmartPlate Double-Wall water heater, complete with boiler-side buffer tank. The large 500-gallon tank was removed and a Modulex EXT boiler was installed on the roof, opening up much more space to work with in the mechanical room. AERCO’s solution of SmartPlate water heater and Modulex EXT boiler proved to be the highly efficient, lower operating and maintenance costs system the school needed. The SmartPlate now fills the ice resurfer’s tank with clean, untainted hot water in less than half the time of the old system.



Designed to Maximize System Efficiency

Widely recognized as the most thermally efficient water-to-water heat exchangers available for potable water heating, SmartPlate heaters incorporate a stainless steel, brazed plate (single-wall) or plate and frame (double-wall) style heat exchanger applied in a counter flow design. As a result, SmartPlate heaters can utilize boiler water as little as 3°C above the desired DHW temperature. They are ideal for use in low temperature systems.

- Eliminate waste associated with overheating DHW and then “mixing down” to safe temperatures
- Low supply water temperatures maximize boiler plant efficiency
- Pair with condensing boilers to further increase fuel savings
- Minimize radiant losses throughout the system
- A lower system set point produces far less scale for increased thermal efficiency, reduced maintenance and a longer heater life
- Minimize over temperature conditions and potential for scalding



Single-Wall, Brazed Plate Heat Exchanger



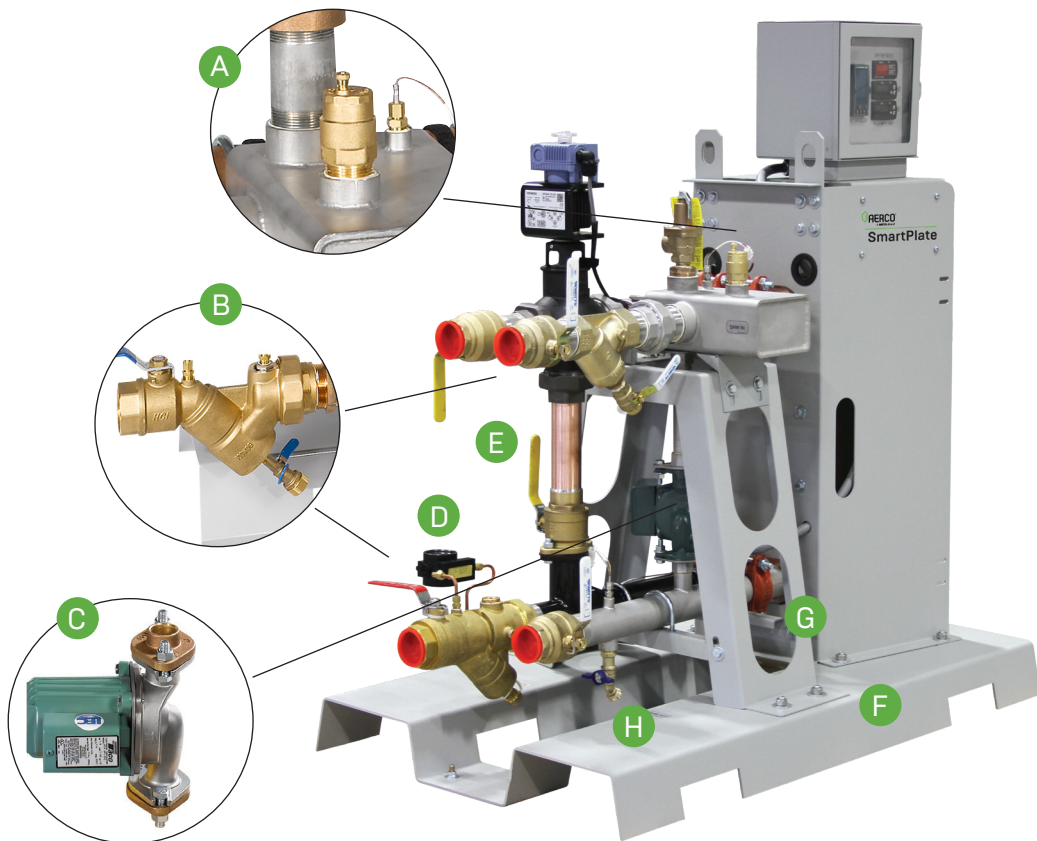
Double-Wall, Plate and Frame Heat Exchanger

Specifications

	SmartPlate Single Wall	SmartPlate Double Wall
Domestic Water Pressure Drop	55 kPa @ max. rated flow	
Ambient Operating Temperature	-5°C to 45°C	
Electrical Requirements	120/1/60 Hz 2 Amp, 220/1/50 Hz 2 Amp	
Standby Amperage Draw	2 Amp	
High Limit “Tripped” Amperage Draw	2 Amp	
Max. Continuous Water Flow Rate	5.7 Lps	
Max. Boiler Water Pressure & Temperature	1034 kPa @ 121°C	
Max. Domestic Water Operating Pressure	1379 kPa	
Adjustable Temperature Control	up to 82°C	
Adjustable High Limit Control	up to 93°C	
Water Connection Inlets/Outlets	1.5” FNPT (SP23 & SP33), 2” FNPT (SP45, SP69, SP150)	1.5” FNPT (SPDW23 & SPDW32), 2” FNPT (SPDW42, SPDW61, SPDW113)
Weight (kg)	SP23 145 (dry), 154 (installed), SP33 154 (dry), 168 (installed) SP45 181 (dry), 200 (installed), SP69 204 (dry), 227 (installed) SP150 277 (dry), 322 (installed)	SPDW23 286 (dry), 295 (installed), SPDW32 295 (dry), 304 (installed) SPDW42 327 (dry), 345 (installed), SPDW61 340 (dry), 363 (installed) SPDW113 526 (dry), 572 (installed)

Fully Packaged to Simplify Installation And Maintenance

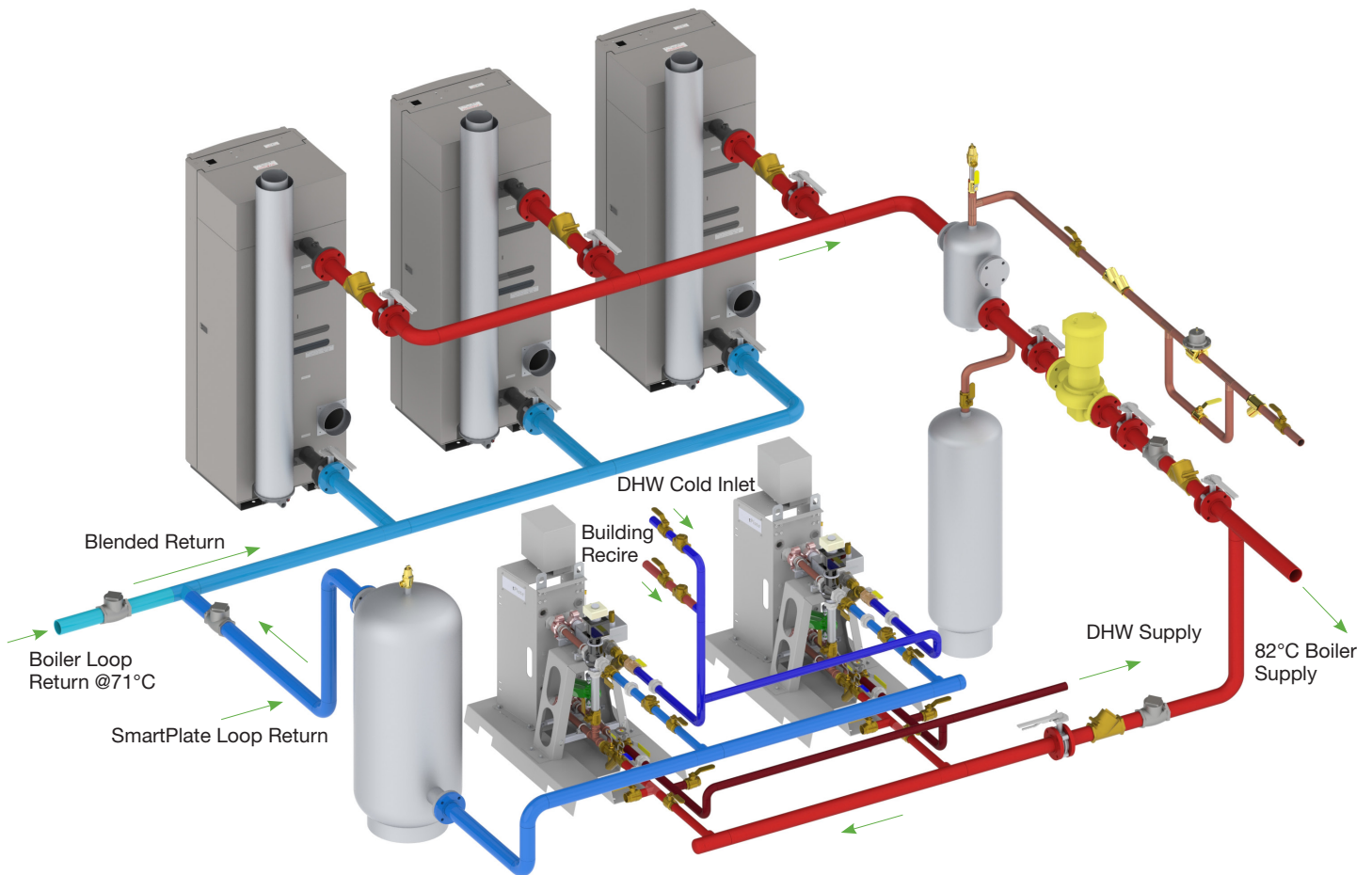
Designed to be a truly turn-key solution, AERCO has packaged each SmartPlate heater with a host of ancillary components you just won't find in other water heaters on the market. Despite a modest <math><1\text{ m}^2</math> footprint and under 1.5 m height, each heater includes a control panel and sensors, three-way electronic control valve, potable water side circulator with clean out connections, DHW drain valve, as well as shut-off valves and inlet strainers on both the boiler water and DHW sides to simplify maintenance for the life of the equipment. And to ensure longevity, all water wetted parts are stainless steel, copper or copper alloy materials. Simple to install, each unit ships fully assembled on a uniquely designed, easy-to-move base with single point header connections for domestic hot water, cold water, boiler water inlet, boiler water outlet and electrical power supply. Units can be applied in 2-way or 3-way operation with controller facing to the left, right or back sides of the unit.



- A** Air Vent/Clean-Out Connection for air elimination and to input de-liming solution when cleaning is required
- B** Shut-off Valves and Inlet Strainers with Integral Blow-down Valve for easy maintenance of both the boiler water and DHW sides of the unit
- C** Potable Water Side Circulator maintains constant flow through the heat exchanger at velocity required to retard scale drop-out and circulate de-liming solutions when cleaning is required
- D** Differential Pressure Gauge at boiler inlet to alert if strainer is becoming clogged
- E** Switch to 2-Way Operation using manual shut-off connected to the 3-way control valve
- F** Easy-Lift Base can be moved with pallet jack or forklift from any side for easy installation
- G** Hx Disconnect Fittings make removal of the heat exchanger fast and easy
- H** Drain Valve on DHW side for easy maintenance

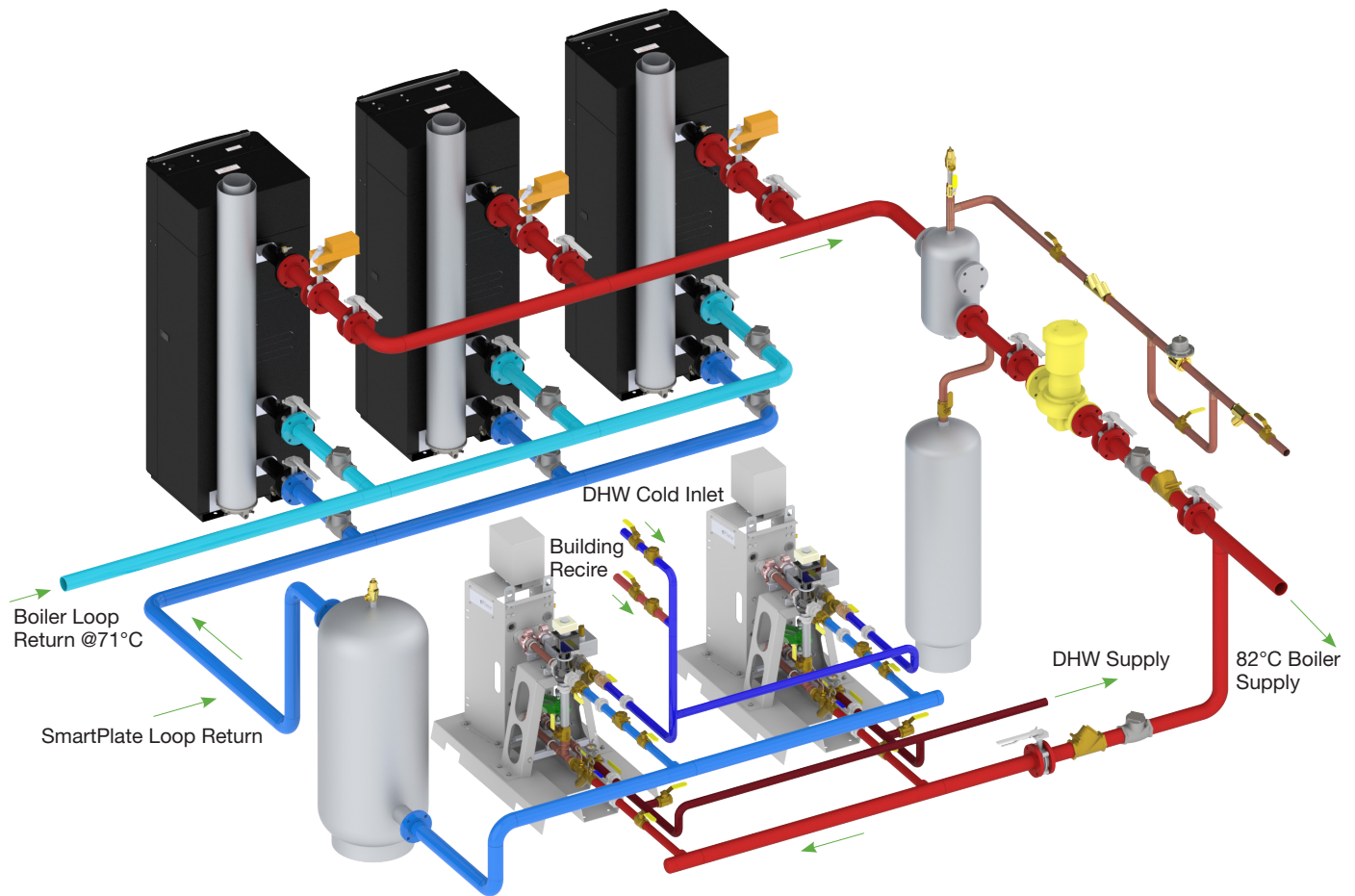
Combination Plant Application: Single Return

The indirect SmartPlate water heater is an Architect's and Installing Contractor's preferred product. There are no storage tanks, vent lines or gas lines to install, and it has the smallest footprint (0.74 m²) necessary for a cramped mechanical room. Each unit can provide up to 5.7 Lps of domestic hot water while increasing the overall efficiency of the boiler plant. A typical condensing, 11°C rise boiler plant with 82°C supply temperature operating at full fire will see an efficiency gain from lower return water temperature due to blending of high temperature boiler loop return and low temperature SmartPlate return.

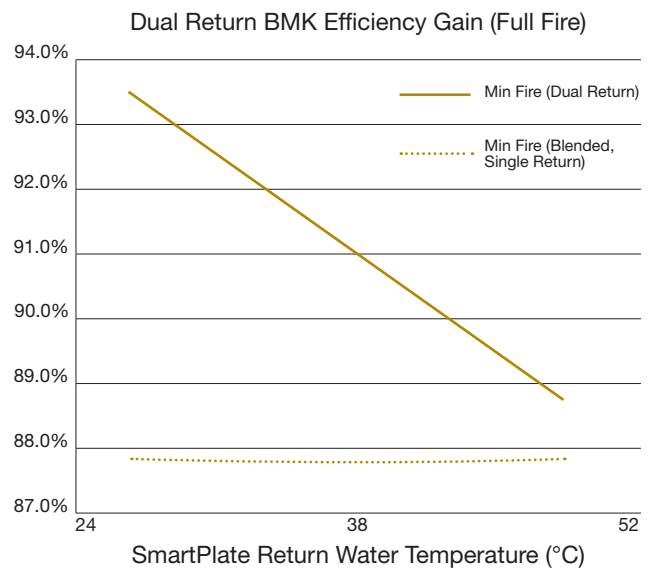
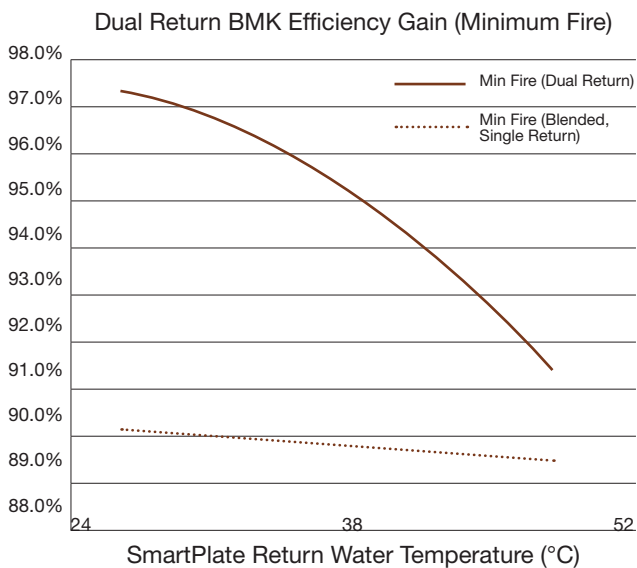


Combination Plant: SmartPlate for DHW solution increases boiler efficiency.

Combination Plant Application: Dual Return



Additionally, for a dual inlet boiler like AERCO's Benchmark series, the efficiency gain would be even higher (3% to 5.5% on average) as shown in the charts below at full fire and minimum fire rate.





Heating and Hot Water Solutions

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