

Today's Water Heating Options

Gas gives you more hot water for less.

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When you consider all of the ingredients that go into your menu and the operation of your restaurant, none are as important as a reliable supply of hot water. All too often the appliances that provide this easily taken for granted “ingredient” are out of sight, out of mind — until you open the faucet and the water runs cold! High-efficiency and Energy Star rated water heaters can provide more hot water in less space and with quicker recovery for virtually every type of foodservice

application, all while reducing the associated energy costs. This executive summary will focus on the various types of water heating technologies available to foodservice operators. After all, when you're out of HOT WATER...you're out of business!

Continuous Flow Water Heaters

Often referred to as “tankless” water heaters, these modern day marvels can go a long way toward reducing your water heating and construction costs. As the popularity of these “on-demand” water heaters grew for residential applications, it didn't take long for the foodservice industry to recognize that it too could



benefit from a smaller footprint and storage tank that would reduce energy costs and increase profits.

There are many brands on the market designed specifically for the high usage of a commercial foodservice facility. Individual units can deliver nearly 10 gallons per minute (gpm) of continuous hot water, so a system can easily be designed to meet or exceed your requirements and, with the increasing price of energy, the opportunity to reduce the cost of heating water can be a real plus to keeping operating costs in check. And don't forget the "green" attributes of only heating water when it's needed and not wasting energy to keep it hot in a storage tank.

Tankless heaters is the most commonly used term, but it's really more accurate to think of this technology as "continuous flow" heaters. This means they only use energy when hot water is called for anywhere in the facility. These units can be installed to deliver hot water to just one or multiple fixtures. When hot water is needed, the cold water flows into the unit where it is heated to a thermostatically set temperature and delivered to the point of use. As the name implies, the tankless unit or system, if more than one unit are plumbed together, does not require a tank to store hot water and can deliver a steady and continuous supply of hot water up to its maximum rated output.

Anytime you come across a product that reduces the equipment footprint and still performs at the same level, or above that of the technology you are replacing, is a real asset as it can allow for more seating or other revenue producing options. And with the freedom for rooftop or other outdoor installations, the infiltration of make-up air required for the traditional indoor gas water heating system is totally eliminated.

Booster Water Heaters

According to the National Restaurant Association, water heating can account for as much as 20% of an operator's annual energy costs. Restaurants that use dishes and glassware are likely to spend an even greater portion of their energy dollar on heating water. Very often the largest consumer of hot water in a restaurant is the warewasher. Optimizing warewashing operations by incorporating a gas-fired booster water heater



for sanitizing dishware can improve the bottom line through reduced energy costs (over electric boosters), increased productivity, and most importantly – higher customer satisfaction!

"Gas boosters give you the fast recovery needed for today's fast paced restaurant operation and they're a lot more economical to operate," says Chef Doug Allen, a consulting chef with Premier Hospitality. "Plus, gas-fired booster heaters don't contribute to costly peak electric demand."

Although electric booster heaters traditionally dominated the foodservice industry, increased electric costs and consumer awareness have made the gas booster an increasingly attractive option. Manufacturers have lowered gas booster operating costs by improving the design for increased energy efficiency, and their reliability has improved ten-fold from earlier models. The compact size, quiet operation, and heating capabilities of gas booster water heaters allow them to be installed in virtually any warewashing situation. Improved technology over the years has allowed booster water heater manufacturers to introduce more efficient burners and unique heat exchanger configurations. And in many cases, installation is easier than ever before as many of today's modern gas booster water heaters can be free vented directly into the warewashing room.

Manufacturers are now incorporating modulating burner technologies to achieve energy efficiencies up to 88% with a 40 degree temperature rise to supply the



required 180°F sanitizing rinse. These improvements have resulted in better heat transfer of combustion gases as they pass through a series of baffles during the heat exchange process. Increased insulation also adds to energy savings by reducing heat loss. Depending on the type of machine you have, most warewashers with electric boosters can be quickly and easily converted to accommodate a natural gas booster. Incorporating a gas high-temp booster heater can also prolong the life of your glassware, dishware and silverware by not subjecting it to harsh chemical sanitizers. Gas boosters are better for your ware, your bottom line, and the environment too.

High Efficiency Condensing Gas Water Heaters

When people started getting serious about improving the efficiency ratings of water heaters several decades ago, condensing water heater designs began popping up from virtually every well-known manufacturer in the industry. Since their debut, there have been improvements to make them more reliable, smaller, and more powerful.

Condensing models are known for being real energy misers because they “wring-out” virtually every BTU produced through the gas combustion process. Before venting the combustion gases directly to the outside, flue gasses are captured and utilized to heat the water even more. A simple analogy is to think of a standard gas storage water heater as being like a water tank

that sits atop a gas fireplace with the chimney running straight up through the middle, exiting at the top. A gas condensing water heater, on the other hand, has its “chimney” or flue designed as a coil, which creates a greater surface area. Because the heat and combustion gasses have much farther to travel before they exit the water tank, more heat is transferred to the water in the tank, substantially increasing the efficiency to 95% or more. Venting has become more simplified too as plastic pipe has become the “norm” for the exiting combustion gas and incoming combustion air.

Many models are equipped with modulating combustion turndown ratios. This means they can fire at lower settings when water heating demand is lowest, and increase the firing rate up to 100% as demand increases. The result is better overall efficiency and less cycling “on-off” compared to conventional tank-type units which can only fire at 100% of maximum input. The benefits that these condensing units offer a foodservice operator are well worth the initial investment as the cost of heating water is often reduced 20 – 30 %.

High Efficiency Storage Tank Water Heaters

High efficiency gas storage tank water heaters employ the same technology as standard gas storage models: a glass-lined steel or stainless steel tank is heated by a burner located at the bottom of the tank. But, with a few basic changes, they operate more efficiently.

High efficiency models have better insulation, heat traps, and more efficient burners. These simple improvements have only a modest impact on price but they can increase efficiency by about 7.5%. To increase efficiency further, some manufacturers add a power vent to accelerate the venting of combustion gasses.

In a standard tank-type water heater, lime scale builds up over time on important heat transfer surfaces, insulating the water from the heat source. This buildup in the bottom of the tank and around the flue tubes can cause tank-type heaters to fail in as little as six to eight years, depending on your local water quality. This decreases thermal efficiency and increases operating cost. Just ¼" of lime scale in the tank can increase operating costs as much as 25%! Many manufacturers






today incorporate a concept that eliminates the impact of lime scale, maintaining a high-rated thermal efficiency and low operating cost throughout a longer life cycle.

“But I’m Not Ready to Replace Yet...”

Okay, so even if you’re not ready to replace your existing standard-efficiency, tank-style water heater with a high-efficiency unit, you can still reduce the cost of operating your “old” unit. Here are a few low cost – no cost suggestions that are certain to save you some bucks:

- If you have a recirculation pump running through your units (this line continually circulates hot water to all your hot water outlets so that it’s always there when you need it), you should install a timer on the pump that will turn the system off when the restaurant is closed. In the water heater test conducted by the Food Service Technology Center, they shut the pump down for 10 hours a day. Turning off the pump greatly reduces heat loss from the pipes, which allows the heater to conserve energy when there’s no demand.
- Next, if your heater has a flue damper, set the damper control on “automatic” versus holding the damper open. You want the damper to open and close as needed. If the damper stays open all the time, you’re constantly losing heat and that’s literally your money going up the stack!
- Finally, insulate your hot water lines so they lose less heat on the way to your faucets and equipment. And the next time you need to replace a water heater, go with a high-efficiency unit with a timer-equipped recirculation pump to get the most out of your energy dollars.

Many operators think of their water heater as “just another piece of equipment.” But according to industry experts, that single piece of equipment may burn as much gas as your entire cooking equipment line! So if your restaurant is using standard water heaters, you can save money — a lot of it — by switching to a high-efficiency model and every manufacturer can show you the numbers to prove it.

To learn more about how natural gas can benefit your operation, log onto the Gas Foodservice Equipment Network at www.gfen.com. 

Water Heater/Boiler & Water Booster Heater Manufacturers *found in the 32nd Edition Foodservice Gas Equipment Catalog*

Aldrich Company

341 East Williams Street, Wyoming, IL 61491
Phone: (309) 695-2311, Fax: (309) 695-5779
e-mail: aldrich@aldrichco.com
Internet: www.aldrichco.com

- Water Heaters, Volume

Bradford White Corporation

725 Talamore Drive, Ambler, PA 19002
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e-mail: fvattimo@bradfordwhite.com
Internet: www.bradfordwhite.com

- Water Heaters/Boilers, Commercial

In Canada:

Phone: (866) 690-0961, Fax: (905) 238-0105
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Paul McDonald

PrecisionTemp, Inc.

11 Sunnybrook Drive, Cincinnati, OH 45237
Phone: (513) 641-4446 (800) 934-9690
Fax: (513) 641-0733

Internet: www.precisiontemp.com

- Water Booster Heaters, PT-56 and PT-200

Raypak, Inc.

2151 Eastman Avenue, Oxnard, CA 93030
Phone: (805) 278-5300, Fax: (800) 872-9725
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Bob Nyland, Commercial Products Specialist

- Water Heater/Boiler, XFyre

RBI Water Heaters

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Internet: www.rbiwaterheaters.com

Janine Pedro, Marketing Specialist

- Water Heaters/Boilers, Futera II

Rheem Water Heating

101 Bell Road, Montgomery, AL 36117
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- Water Heaters/Boilers, Rheem-Ruud Spiderfire
- Water Heaters/Boilers, High-Efficiency Condensing

In Canada: Phone: (905) 450-4460

Rinnai Corporation

103 International Drive, Peachtree City, GA 30269

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Internet: www.rinnai.us/commercial

Customer Service

- Water Heaters/Boilers, Tankless