

20929 Bridge Street, Southfield, MI 48033 4121 Brockton Drive SE, Grand Rapids, MI 49512 6200 Baron Drive, Bridgeport, MI 48722 6910 Treeline Drive, Suite A, Brecksville, OH 44141

Phone: (800) 589-6120 - Fax: (248) 354-3710 www.deppmann.com

December 14, 2009 ~ Monday Morning Minutes: Using Larger Design AT in Hydronic Systems using Condensing Boilers By Brad Notter with edit by Norm Hall

The Monday Morning Minute articles for the last few weeks focused on condensing boiler efficiency in response to modulation and return water temperatures during reset. When thinking about new systems there is a real advantage to using greater temperature differences in the design.

Using a 20°F Δ T as a design standard could be a thing of the past. As we design systems today we try to maximize the overall efficiencies and total cost of ownership. One way to accomplish that is by using a Δ T larger than 20 degrees. This type of thinking parallels ASHRAE 90.1 and LEED and will help to keep money in the owners pocket. Let's take a look at the math.

Q=500 X GPM X Δ T X Sp.Gr X Sp. Ht.

Where Q is the heat generated in BTUH; GPM is the Gallon per minute flow rate; Delta T, Δ T, is the design difference between the supply and return water temperature. At normal water temperatures for hydronic systems the specific heat and specific gravity are about 1.0. If we design the system to maintain BTUH while raising the Δ T the GPM will be lower.

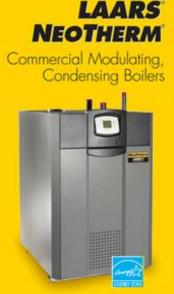
For example If you had a system with a 30 degree ΔT using a 1:1 reset ratio with a 0°F outdoor design temperature and a 180°F design water supply temperature, the boiler could be condensing at a low outdoor temperature of 15 to 20°F. Imagine if we used a 40°F ΔT for the same system, we could be condensing at an outdoor temperature of 5 to 10°F. Higher efficiency more of the time!

Along with the increased efficiency of the boilers the overall pumping horsepower is reduced due to the lower flow from the higher ΔT . This lower flow will reduce the pipe sizing, control valve sizing, insulation, and compression/expansion tank size due to lower system volume.

Using lower flow rates and lower average temperatures will require increases in the square feet of terminal units. Most terminal units, properly selected, can handle the change with 10 to 20% more surface. We find the reduced cost of piping, valves, and pumps outweighs the cost increase in terminal units and the end user is left with a system designed for higher efficiency and lower operating costs.

Ask your R. L. Deppmann sales engineer to review these changes on your next project while specifying High Efficiency Condensing Boilers by Laars, Aerco, and Bryan.

Thank you for using products sold by R. L. Deppmann Company in Michigan and Ohio!



NEOTHERM is a direct vent, sealed combustion, condensing boiler with 95+% AFUE that modulates with a 5 to 1 turndown.

The boiler features an ASME stainless steel heat exchanger, integral boiler pump (399 and 500 also available without pump) and low NOx emissions (10 ppm NOx), for a package that's easy to use, and is easy on our environment.



Disclaimer: R. L. Deppmann and it's affiliates can not be held liable for issues caused by use of the information on this page. While the information comes from many years of experience and can be a valuable tool, it may not take into account special circumstances in your system and we therefore can not take responsibility for actions that result from this information. Please feel free to contact us if you do have any questions.