Question:
Can you quantify efficiency gains that might be obtained by supplying water to heat emitters at temps lower than what boiler is producing?

Answer:
The easiest way to quantify it is a boiler manufacturer’s efficiency table. These tables are based on return water temperature. If you look at the table for the boilers you use, as an example, you can see the efficiency at 120 F vs 140F.

Question:
Does it matter which side the injection pump is on going to the heat source?

Answer:
If you look at idronics 7, it does show the mixing pump on either side. The important thing is to insure the balancing valve is installed in the other injection riser. Refer to idronics at this link: http://www.caleffi.com/usa/en-us/technical-magazine

Question:
I use a mixing station with outdoor reset and mod/con boiler with separate outdoor reset for multiple zone staple-up radiant and 2nd floor panel radiators.

Answer:
That is one way to go about it. Depending on the water temperature for the staple-up (hopefully with plates) another option may be to size the panel radiators for the same temperature. The panel radiator cost will increase but the equipment cost to deliver the second outdoor reset will be eliminated. Additionally the overall efficiency will increase since I am not mixing in a warmer water temperature in the return to the boiler.
Multiple Temperature Regulation in Hydronic Systems

Question:
Viessmann boiler runs continuously as opposed to other boilers that ignite after a "TT" demand. Do you care? Does it affect efficiency or operation? Do you prefer one boiler strategy over another?

Answer:
When I think of outdoor reset, my goal is to run with the lowest water temperature needed to properly heat the building. If I achieve this, I will be heating the building 60 minutes of every hour since this is how the building is losing heat. From an operating standpoint, the Viessmann boiler doesn’t run continuously, the pump does and the boiler fires as needed to maintain temperature. When I look at the two strategies, the results should be the same: constant circulation. If TT is holding the boiler pump off, it indicates no zones are calling which means the heating curve is probably set too high.

Question:
Will a system sensor from my boiler on the GS System Outlet (Load) side of the hydraulic separator help me track boiler modulation?

Answer:
It is more about water temperature. It will ensure that regardless of the mixing that is occurring in the hydraulic separator, the correct water temperature will be delivered to the heat emitters.

Comment:
You may want to add that it is always good design practice to design around the lowest water temps.

Question:
Yes it does. If you have a non-condensing boiler, with baseboard convectors (for example), does it still make sense to run lower temps to the baseboard if, for example, outdoor temps are warmer?

Answer:
Yes, there is something called the three to one rule which states that if I lower my water temperature by 3 F, the efficiency will increase by 1 %. Check out Richard Trethewey's 12 Commandments of Comfort on the web. Two things to consider: I cannot ignore the dew point so there will be a minimum temperature I can drop down to and also baseboard has a minimum temperature associated with it so I cannot reset below these temperatures.
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Question:
I'd like to install a condensing boiler that does DHW (priority or not), large garage slab floor (2000 sq. ft.) and snowmelt with a 300K load. Recommend two separate boilers?

Answer:
From a sizing and control standpoint, two separate systems may be in order. The considerations that drive me in that direction are first the size of the two loads will be quite different. The hours per year that space heating is much larger than the hours where I need snow melting. If I size the boiler for the total load, I may have a situation where the minimum firing rate is the building load. I hate to have a boiler that never leaves low fire. Next if I am doing snow melting with a single system, I will use a heat exchanger to separate the glycol system for snow melting from the heating system water. I will have to run a boiler hotter to supply a heat exchanger than if I direct connect the snow melting to the boiler. Additionally I will need a mixing device to maintain the slab water temperature when the snow melting is calling. So the piping system and the control strategy then become more complex.

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