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Exclusively in the Blue Valley Times

Comfort by Design

There are rules that apply when I design a heating or cooling system. There are dozens of parameters that need to be set before the computer can say just how much heating or cooling a space needs. Some of them have to do with the size and construction of the structure and especially the insulation and air tightness of it. That isn't always easy to specify and I err on the side that will NOT undersize a system.

The design program I use is tied to a historical weather database for our area that NOAA makes available. It stores daily high and low temperatures for our area as well as humidity. It has temperatures broken down into hours at each temperature on each day for many years of historical data. These are averaged and make a case for exactly how much heating or cooling energy a structure will need. What I need to enter is the desired indoor temperature and it really only applies to the hottest and coldest days for sizing purposes. Those days are referred to as design days. The results are returned in Btus/hr. and that is the goal for selecting equipment. The lost energy from pipes in a heating system and the ducts in an air conditioning system are also factored in because if you have an air conditioning system in an attic, approximately 20% of the energy is lost into the hot attic.

Comfort is relative and very subjective and I also say that it is elusive. When you come in from the outside on a cold winter day it feels good. A half hour later you have acclimated to the indoor temperature and now it feels a little chilly. That is your mind playing tricks on you. In the summer if the humidity is removed from the indoor space to say 45% it feels good even at 78°. But people crank down the thermostat to some frigid temperature and expect the air conditioner to hold the house at 68° when it is 95° outside. Good design is to hold a house at 68° when it is 10° outside and 75° when it is 95° outside. Oversizing either one makes them inefficient on every day except the design days and that is not a good thing. Sure you say you don't care but if every system in every home is oversized the strain on the grid is horrible and unnecessary. Adjust your attire in the winter and your activities in the summer to keep within a reasonable range. Your pocketbook will thank you.

Ken Field is the owner of Slate Belt Energy and Field's Service, Inc. As a certified energy rater and contractor, he is qualified to assess every aspect of energy usage and prescribe solutions to save energy. He can be reached at 610-759-6306 or email Ken@FieldsService.com

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