

Contemporary Heating and Viessmann Manufacturing Low temperature Boilers and Controls

So many of the heating systems in today's better home will have a combination of floor heating in the kitchen, bath and great room and higher water temperature baseboard or hydro air in the rest of the house. The hardest part of these jobs is not the piping or tubing installation it is in the proper control methods. Viessmann has figured it out. The Vitotronic control series is a real breakthrough; snap together connections, self diagnostics, one voltage, a digital control for total system management. It takes what is always the hardest aspect of these jobs, the control wiring and makes it get installed without pain.

First of all, there are a variety of ways to get heat in any home. Any boiler can make hot water, any combination of controls can change water temperature according to outside temperature and then prioritize the system for production of domestic hot water. It is the system that is at issue. How do you get a variety of products and vendors correctly installed in the first place? When 6 - 12 different manufacturers have components in the system, which has responsibility? When the original control wiring installer is gone from your world, can anyone else troubleshoot or service the system? On the boiler side, can we get it to stay burning clean or will condensation from all this mild temperature water lead to system efficiency drop off?

Viessmann patented a breakthrough in boiler technology in the mid 70's. During and after the fuel embargo of '73, the German government stepped in and mandated that heating systems could no longer have an operating water temperature higher than 167 degrees F. At the same time, the super plastic, PEX, was causing tremendous growth in the floor heating business and system water temperatures continued to go down. It had a terrible impact on boilers. When the water temperature in the boiler is below 116 F for oil (138 F for gas), water condensation will form on the fire side of any single wall (cast iron or steel) heat exchanger. The other physical consequence is thermal shock and flexing of the sections of any traditional design.

Viessmann explored beyond the traditional sectional design and borrowed the heat shrinking technique originally employed by Daimler Benz for the pistons in their engines to develop the Bi-Ferral. The Vitola BiFerral uses two metals; cast iron rings shrunk fit into a steel sleeve to make what many would call the perfect boiler. It is a boiler that you cannot shock, cannot create condensation and has so many unique and patented features that is now the largest selling production boiler in the world with over 2 million of them in service since 1975. Some of the key features are:

Sandwiched Heat Exchanger - The right metals in the right place; cast iron for superb heat absorption *and* transfer, steel for flexibility in forming the perfect shape of the vessel as well as resistance to thermal shock.

Self cleaning combustion chamber - Titanium stainless steel in the combustion chamber for clean burn and long life Because the chamber is dry backed (no water behind it) it gets to be approximately 1200 F within seconds and bums off any unburned oil or soot from the previous cycle. It also means that the end cone of the burner is always surrounded by a controlled and perfect combustion environment.

Sludge settlement zone - In any hydronic system, ferrite sludge and any other foreign matter can work its way back to the lowest point in the system which is normally the boiler. As it

settles out in the off cycle or off season, it can and will affect transfer from the fire to the water side. Viessmann does two things; their design allows sludge to settle away from the water to fire transfer core and they employ a return water tube that moves water properly throughout the boiler

Large water content - In an ideal world, any oil or gas burner would have a long on time and then a long off time. Each new cycle has incomplete combustion for the first 1 to 5 minutes and often a light layer of soot gets applied to the firebox with each cycle. The typical water content on the biferral boiler is between 18 to 33 gallons. Larger water content is the way it should be if you are looking for steady efficiency, long life and reduced wear and tear on components.

Super Insulated - Three inches of insulation around every surface keep the heat in. The fibrefrax material in the swing door allows you to keep your hand on the burner door during the *entire* burner cycle. Traditional heating plants have 3/4" insulation because the AFUE rating system rewards higher standby losses to the boiler room (lower net stack temperatures) Viessmann puts heat into the *building*, not the *boiler room*.

More Material - For those who like to shop by the pound, there is more material that goes into this equipment; as much cast iron as any traditional boiler, heavy gauge steel around the heating core and water passageways, titanium stainless steel in the combustion chamber.

Boiler as a system - The boiler is provided with a stand that puts the burner up off the floor so dirt and dust are not sucked into the burner. The burners are preadjusted to match the boiler. The burner has a 15 second prepurge to establish good draft before fire. The piping is all from the back for a clean neat appearance. All service is from the front of the boiler. All adjustment for heat and hot water are on the Vitotronic console.

VITOTRONIC CONTROL SYSTEM

There are so many features and reasons to consider the Vitotronic that they are too numerous to list them all. Since the US contemporary heating field (floor heat etc..) started around 1987, the single hardest thing about these systems is rational control methods The Vitotronic takes the control electrician's interpretations out of the loop. Some of the supporting information and benefits of Viessmann's control system are:

One Voltage - No dueling transformers, relays talking to relays talking to... This System is all 120 Volt so one box controls everything

Override Button - The homeowner insurance policy. When the button is pushed every circulator comes on, the burner fires to its high limit *but* the mixing valve for the floors will close so the slab doesn't get smoked. The mixing valve can be manually opened for heat but will reengage when the system is back on automatic. If the buttons pushed and the burner doesn't come on, it's the burner or fuel supply, not the control.

Domestic Hot Water Control - When the storage tank needs heat, the heating pumps stop and the burner fires. The domestic circulator will not come on until the boiler is fifteen degrees hotter than the storage tank which eliminates the common problem of reverse transfer

(heat being sucked from the tank to the boiler in the first period). After the tank is satisfied, one of three criteria are met, in the summer, the domestic pump will stay on for ten minutes to take the heat from the boiler, in the spring or fall, the domestic pump will run until the tank and boiler are within 15 degrees of each other and in the winter, the pump will shut off immediately and the system goes back to heating the building.

Diagnostics - The selector dial allows every sensor to be checked and for pumps and mixing valve to be tested.

Weather responsive pump switching - At the end of the heating season, the pumps know when to shut off so that there is no chance of dueling systems from air conditioning and heating on at the same time. The system will also bring on every circulator in the building for 10 seconds every day of the year so that water lubricated pumps won't bind up in the off season

Digital Technology - The entire "brain" is a 2" x 2" computer that has DIP switches for programmability. It includes mixing valve, boiler and domestic logic as well as numerous potential adjustments. This is the far safer technology versus older analog slide in boards first used in the seventies.

I don't know all the particulars of the heating system you are working on. I do know that you can take advantage of clearly proven, available and superior heating equipment and controls if this is a home that people will be staying in for a while. And if you really factor in the system cost and the advantages of the control system, there is not a premium for it. Better heating equipment always will pay for itself if it actually is controlled, installed and serviced correctly.

As far as domestic hot water goes, Viessmann boilers and controls can work with any indirect water heater or you can use the VertiCell. The Viessmann Verticell titanium stainless steel tank is a forever solution mid the finest tank available. They produce over 200,000 tanks per year and have had a *total* of 5 field failures *worldwide* in 15 years. In life cycle, (you don't replace it) it is the best value tank out there. You just have to invest one time. And the color matches...

Viessmann has engineered these systems so that any additional costs you spend for the equipment will always return many times over in savings, long life, low service complaints and greater comfort. I have included some additional information on low temperature heating and Viessmann equipment. I hope it is helpful. Please review it with everybody that would be interested and please don't hesitate to call your Viessmann contractor, distributor or factory representative. There is a better way.

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