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ECM Smart Pumps in Domestic Hot Water Recirculation - B&G Temp Setter™

Monday Morning Minutes | by Norm Hall, February 18, 2019

ECM Smart Pump technology seems to be the buzz in marketing and sales of hydronic and plumbing products. There is a definite advantage to ECM if you use the B&G Temp Setter for balancing. Since I write this just after Valentine's day, dare I say these products were made for each other!

ECM Motors vs. ECM Smart Pumps

ECM is still new to hydronic and plumbing systems. Let's take a moment to review the difference between ECM motors and pumps. Under 5 HP, an Electronic Commutated Motor is about 20% more efficient than a standard inline pump motor. Over 5 HP the EPACT Premium efficient motors are so good that the ECM only adds 10% efficiency. Still a nice increase in efficiency. Why an ECM motor is efficient was the subject of an earlier blog.

The ECM motor ***may also*** have the ability to "dial down" the speed and in our world, that means eliminating the energy waste of overhead pumps. How Can an ECM Smart Pump Save Energy was also the subject of a previous blog.

If the ECM motor is attached to a pump with even more capabilities, we call it an ECM Smart Pump.

Traditional Balance and ECM Pumps Problems

The problem with traditional manual or automatic balance valves in domestic hot water recirculation systems is that they have a constant flow. An ECM pump will give you a more efficient motor and can reduce over-heading. There can also be a hidden problem.

In domestic hot water return system pump sizing, we normally ignore the pressure drop in the hot water mains. In most buildings, all we have is the few hundred feet of small return pipe pressure drop so the pump head is small: in the range of 8 to 20 feet.

Think about the hot water supply pipe. Let's assume there is large hot water use; think cafeteria or laundry right after the water heater. If this causes a 3 PSIG or 8-foot pressure drop in the main, what happened to our recirc pump? If the pump was sized, for example, 20 GPM at 10 feet and we now have 8 feet we did not account for, the rest of the building will be affected.

I have run into this more than one hundred times in my career. The answer is a need for more pump head. That pump head will overflow the system when the load is not present so this system also needed automatic balancing valves.

The interesting thing is that if we had a smart pump on the system, things would get worse. When the flow rate dropped, the operating point of the pump would move back on its curve. A smart ECM pump would assume the load had dropped because of lack of need and the pump would slow down. *This would make the problem worse!*

B&G Temp Setter and ECM Pumps – A Marriage That Will Last!

The Bell & Gossett Temp Setter balance valve will enhance the use of an ECM pump and allow oversizing of the pump head for those unusual applications. The Temp Setter is just like a two-way control valve in hydronics. As the load drops, so does the flow. As the flow drops, the ECM pump can and will reduce its speed and save energy. If the situation above occurs you can add some head to the pump and it will dial down to meet its need. If a large hot water pressure drop occurs, the Temp Setters will sense a drop in temperature and open up which will in turn speed up the pump to meet the requirement.

Let me say, there is nothing wrong with the old, tried and true, constant flow balance and a simple B&G PLB bronze recirc pump. If energy and more control is your forte, Temp Setter and Ecocirc XL, are the couple you want.

Give us a call or call your local B&G representative for a free analysis. Check out the system with the “best” solution for energy conservation and the “best” at providing consistent hot water recirculation to today’s standards.