

TECH WORKSHOP

John Barba tells all

Ready to explore variable speed circulation?

BY JOHN VASTYAN
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Renowned Taco trainer John Barba opened a recent webcast this way: “I’m John Barba, and today’s topic is variable speed pumping. It’s not a new concept and it’s not very hard to do.”

Well, I’m *not* John Barba, and that’s why the topic of variable speed hydronic circulation has been something of a mystery for me. But being the talented educator that he is, I’ve come to learn a lot more about the technology. I’m eager to share it with you.

Barba goes on to point out that 2004 was the year Britney Spears got married and broke his heart. Twice. Also in 2004, America’s domestic engineer, Martha Stewart, was sent up the river for crimes against humanity. And, 2004 was also the year that Taco introduced the world to a full line of residential variable speed circulators. That was five years ago, but it seems that many of us in the hydronics industry are still grappling with this “new” technology.

Let’s take a closer at the concept of variable-speed pumping. I’ve asked Barba and professional contractor Bill Riley (www.rileyplumbing.com) to explain when it’s best to apply the technology, where you’d use it, and what the key benefits are.

Why variable?

The purpose of a variable speed circulator is to automatically adjust its speed

based on heating load demands. With variable speed pumps, systems can be designed and installed to place precisely as many BTU’s into a building as needed.

One of the best things about Taco’s approach to variable speed circulation is that they’re eager to offer engineers and installers a real understanding of how the technology works and is best applied. “We’re not into telling professionals, ‘Just push a button and walk away from the pump; it’ll set itself,’” he said. “My ‘students’ tell me they really enjoy having an understanding of how it all works, and relates to system performance.”

“I can attest to that.” said Bill Riley, president of Warwick, R.I.-based WJ Riley Plumbing and Heating, an admitted hydronics junkie. “My guys and I have all learned so much from John Barba. “Our understanding of the technology and how best to apply it has improved our dedication to the craft.”

Barba says he most enjoys seeing “light bulbs go on” when installers and engineers gain true understanding of the impact of variable speed circulation and its role in improving system efficiency and even boiler performance. “If boiler short-cycling is an issue, one of the solutions may be to replace one or more pumps with a variable-speed circulator,” he said.

The perfect hydronic storm: Dropping Delta-Ts

Another concern is pressure differential within the system. As zone valves close, a system curve intersects a pump

curve at higher and higher pressure differentials. This greater pressure differential can cause higher flow velocities within the system that can quickly lead to velocity noise. It’s the perfect hydronic storm: with a fixed-speed circulator, it’s easy to have poor heat transfer and inefficient, noisy operation all at once.

One way to deal with the noise would be to install a pressure differential bypass valve, like the Taco 3196, which prevents flow when all of the heating zones are calling. But as those zone valves close, increasing pressure differential within the system, the 3196 bypass valve opens to allow excess pressure and flow to pass through back to the suction side of the pump.

A better solution would be to use a mid-flow, low head, flat-curve circulator like the Taco 007. With such a pump, system pressure rises minimally, eliminating the need for a bypass valve. But, if the job has higher head requirements than the 007 can deliver, a better solution may be a variable speed pump.

“If all of the zones in a system are calling for heat, we may find that the Delta-T drops to 16 degrees, not the 20 typically designed for,” said Barba. “Doesn’t sound like much, right? But that also equates to about a 20% difference. With only two zones calling, the Δ -T drops to about 15° — a 25% difference. And with only one zone calling, the Δ -T drops to 12° — a whopping 40% difference.”

At this point in the classroom, Barba’s usually waving his arms for emphasis.

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“Solve the dilemma of dropping Δ -Ts by using a fixed Δ -T, variable-speed circ!” he explained. “You may never have to worry again about over-sizing a circ.”

Rather than searching for the point where the system curve intersects the pump curve, let the pump curve self-adjust every moment and every day of the heating season.

Variable speed circs, by design, are also easy to set up. Simply dial-in the pump to meet the required Δ -T.

“The simplicity of it — pump choice, installation and performance — is a huge asset for us,” concluded Riley. “We know exactly what pumps to apply, and how to finesse hydronic flow — like dialing-in comfort for our customers.”

Go with the flow. ■

John Vastyan owns Manheim, Pa.-based Common Ground, a trade communications firm that, for 22 years, has been focused on the world of hydronics and HVAC.