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# Phc News

plumbing & hydronic contractor news

## 1 BOILER EFFICIENCY

### Smart, efficient near-boiler piping

BY JIM ERHARDT

Modern hydronic heating systems have evolved in complexity over the last few decades, and — no doubt — we'll continue to refine and improve them. With this evolution, the need for proper piping design and technique has become more important. While simple systems, say a boiler and one or two baseboard zones, are pretty forgiving to piping error, systems that include radiant heat or fan coils aren't so tolerant.

A single piping error in a radiant system, for example, can lead to a system that refuses to deliver the expected comfort and efficiency, or simply just won't work at all.

It's little surprise to learn that most contractors who successfully install radiant heating systems have: a.) learned from a lot of expensive, time-consuming trial and error, or (Turn to There really... page 2.)



The author (left) and hydronics guru Dan Holohan discuss the Watts pre-assembled, pre-engineered Boiler Header Module package in relation to their shared passion for hydronic heating.

## It's modular

While at this year's AIHR Expo, an editorial team from *Phc News* and *Plumbing Engineer*, along with a TV crew and Dan Holohan, visited with Jim Erhardt on the show floor. Holohan and Erhardt have known each other for years, so they jumped right into an easy conversation about a topic they both know a thing or two about: near boiler piping.

As the big camera moved beyond the two of them, it includes a display at the very front of the Watts booth. The display shows a new near-boiler piping module that was the topic of Dan's and Jim's conversation and is sure to be of interest to hydronic heating professionals.

The preassembled, pre-engineered Boiler Header Module package consists of three Watts products; the PIPF flanged purge valve, the RBFF residential boiler fill fitting and the new AS-MB micro-bubble air separator in flanged configuration. These three products not only create tech-

nically perfect near-boiler piping, but also save the installation contractor considerable time doing this critical piping work by avoiding a bucket full of fittings to accomplish the same task.

The flanged micro-bubble air separator (AS-MB FL) features flanged connections — fixed on one side, swiveled on the other — that can accept the purge valve, a circulator or circulator flange. It uses a removable corrosion-proof coalescing media that resists temperatures to over 300°F. It also features the Watts DuoVent air vent assembly that can be easily removed for inspection or replacement. The micro-bubble air separator is also available in 3/4", 1" and 1 1/4" FPT connections.

The residential boiler fill fitting features a one-piece forged body and a three-way ball valve design that facilitates easy servicing of the system fill valve and expansion tank. It also includes a pressure gauge for convenient reference to system pressure when making adjustments to the fill

valve, a component that, alone, replaces up to 18 individual fittings.

The flanged purge valve features a full port ball valve design, and integral purge port with tethered cap and a swivel flange connection. It is available in 3/4", 1" and 1 1/4" FPT sizes.

With this combination of products, boiler installations are faster, neater and more compact. The Watts module takes up far less room in the near boiler piping than it would if the pieces and fittings were assembled individually on site. The customer will no doubt appreciate the professional-looking installation as well as the improved efficiency and serviceability the Watts module offers.

All of the Watts components are available individually, collectively as the Boiler Header Module, or as components of other Watts hydronic packages. Learn more about them at [www.watts.com](http://www.watts.com). ■

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## BOILER EFFICIENCY

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### There really is a better way to do near-boiler piping

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b.) have received the training to make sure the system goes in right and delivers the comfort and efficiency the customer expects. I know from personal experience: there's usually some of each in all of us.

As boiler technology has pushed operating efficiencies to new heights, the need for correct near-boiler piping has become more critical. "Near-boiler piping" generally refers to the piping and system components that are installed directly to the boiler and connect it to the distribution piping. These components typically include the system expansion tank, fill (pressure reducing) valve, air separator and in some cases depending on system design, a circulator and system purge.

The arrangement of these components in the near-boiler piping turns out to be a critical point of consideration when installing the system. Not only must these components be sized properly, but they must be installed in specific relation to one another to ensure proper system function and performance.

Working well is only one part of the picture, however. Future servicing of the system should be considered, too. A well-designed and installed hot water heating system will not only provide efficiency and comfort, but will also be highly serviceable.

Fortunately, most boiler manufacturers now offer their preference for specific near-boiler piping in boiler installation manuals. These piping and component details are

adopted from the Hydronics Institute; the recommended piping schematics help installers avoid myriad problems.

Most boiler manufacturers have adopted this piping arrangement, and it's no coincidence. The piping detail covers all of the concerns in a very efficient manner. Some of the key issues addressed are these:

Placement of the circulating pump with its suction port immediately downstream of the expansion tank. This ensures that the pump's developed head pressure is added to system fill pressure. This helps to

**If our Yoda of the Hydronics Industry points to the wisdom of proper piping in the mechanical room, there's gotta' be something to it, Right?**

control air problems.

The fill valve is piped to the system with the expansion tank. This safeguards the valve from fluctuating pressure caused by the pump. Without this step, unwanted fill water and excessive system pressure are sure to happen.

Optimal placement of the system air separator. There's no better place for this component than at the point of highest temperature and lowest pressure. This is where dissolved gasses are most likely to come out of solution and are most easily arrested

and cast out of the system.

Inclusion of a system purge. After all, if a need arises, we want quick and efficient purging of an entire multi-zone system, including the boiler.

Taking this a bit further, some boiler manufacturers show an isolation valve between the system and the expansion tank. In a modern system with the pressure relief valve installed directly on the boiler, the 100-year-old engineering directive to not place a valve there – from the days when the relief valve was installed on the expansion tank – can now be ignored.

The benefit of this valve is to enable the easy servicing of a diaphragm-type expansion tank. A little-known fact about these tanks is that the air pre-charge must be checked annually. The only way to accurately do this is to isolate the tank from system fill pressure, meaning that the air charge can be accurately measured only when there's no system pressure on the wet side of the diaphragm.

Just like a tire on that car or truck you drive each day, a diaphragm tank, over time, can (and most likely will) lose some of its pre-charge. Just like riding on a soft tire, under-inflation can lead to premature tank failure. With inclusion of an isolation valve, the critical service point of matching the air pre-charge to the system fill pressure becomes much easier to do.

In my years of attending and conducting contractor training seminars on hydronic design and installation,

I've noticed that the old excuse of "this is the way I've always piped a boiler" is slowing giving way to the realization that there is indeed a "better way" to do this. After all, the near-boiler piping – like the arteries and valves nearest the heart – play an important role in seeing to it that the rest of the system gets what it needs. And, if not, you'll hear from your customers, all too often when it's late. And cold.

Dan Holohan's written some really good, really funny articles on this topic. And, hey, if our Yoda of the Hydronics Industry points to the wisdom of proper piping in the mechanical room, there's gotta' be something to it, Right?

A quick scan of boiler manufacturer piping diagrams reveals that a specific, smart, well-thought-out arrangement of components in the near-boiler piping will ensure highest operating efficiency and greatest ease of commissioning and service.

It's our collective hope here at Watts that installation contractors will take these recommendations to heart. After all, you want your installed systems to perform as expected, and so your customers. If they're happy, you'll be happy, too. They sleep better. You do too.

And meanwhile, down in the mechanical room, that new mod-con is humming along beautifully, pumps, valves and other components are working in concert and warmth flows like hydronic heaven. ■

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