

# CONTRACTOR

THE NEWSMAGAZINE OF MECHANICAL CONTRACTING

PLUMBING | PIPING | HYDRONICS | RADIANT | BATH/KITCHEN | TECHNOLOGY | TOOLS | TRUCKS | GREEN | MANAGEMENT



Mod-Con's Rich Swatton.



The cast iron stayed.

## Efficiency is immune to the law of gravity

SPECIAL to CONTRACTOR

HANOVER, MASS. — Despite the harsh winter in the Northeast, one Massachusetts family was the coziest they've ever been following a much-needed mechanical overhaul. And, what's best, said the homeowner: they watched in satisfaction as their energy bills fell to levels they've never seen. Their home — a 4,500-sq.-ft., farmhouse built in the 1850s on Boston's South Shore — came with its own piece of history.

"It's known locally as the 'Anchor Homestead,'" said Christian Frattasio, with manufacturer's rep firm, Emerson Swan. "For the

seven generations, the original homeowners — the Beal family — used it as the clan's anchor. No matter how far and wide family members were cast during various eras of American progress, they always came home several times a year to maintain close ties."

The property is not only rich with New England heritage, but also hydronic history. Originally equipped with a big gravity hot water system (once as common as clam chowder in these parts), then later retrofitted into a forced hot water behemoth some 40

► Turn to Efficiency, page 12

## MCAA's Cables: Focus intently on your customers

BY ROBERT P. MADER OF CONTRACTOR'S STAFF



Cables

SAN ANTONIO, TEXAS — When Michael R. Cables takes over as president of the Mechanical Contractors Association of America at the group's annual convention here in mid-March, he'll be a little bit different from other MCAA presidents. Many MCAA presidents hail from family-run or privately held contracting firms. Cables, on the other hand, is executive vice president, labor relations, for me-

► Turn to Cables, page 48

## AHR Expo breaks records, showcases most innovative products

BY CANDACE ROULO and ROBERT P. MADER OF CONTRACTOR'S STAFF

DALLAS — This year the 65th AHR Expo, Jan. 28-30, Dallas, broke records for Southwest shows — more than 51,000 attendees filled the aisles of the Dallas Convention Center, covering 397,000-sq.-ft., to see all the newest and most innovative products and technologies from more than 1,900 exhibiting companies.

"We were very pleased with the attendance and the enthusiasm on the show floor," said Clay Stevens, president of the International Exposition Company that produces and manages the AHR Expo. "The aisles were packed for almost all three days of the Show."

Xylem Inc., a global water technology company, previewed the addition of its integrated VFD sensorless control on the Bell & Gossett series 80 & 80-SC in-line pumps.

Available in the second quarter of 2013, the variable speed drive sensorless controller utilizes the latest generation hardware platform with advanced pumping software and proven algorithms to create a smarter, more cost-efficient and energy-saving pump system for

HVAC and pressure booster applications. The sensorless control mode eliminates the cost and complexity of installing and main-

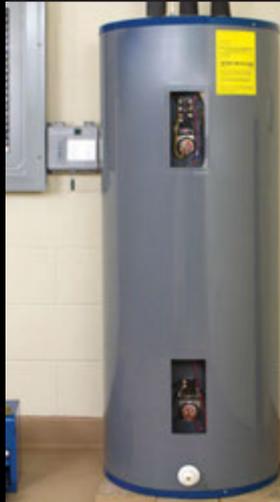
► Turn to AHR, page 6

The Trilogy 40 Series heat pump

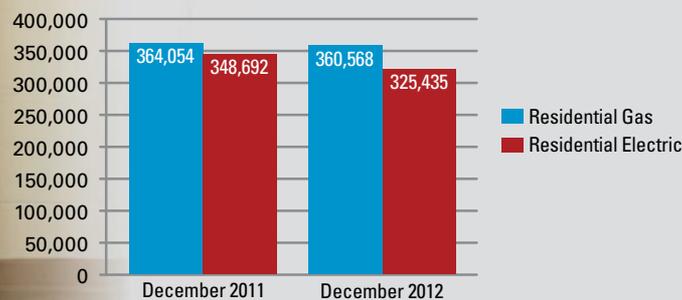


The GeoSentry zone valve

## CONTRACTOR INFOCUS



### U.S. shipments of residential storage water heaters



Source: AHRI 2012 U.S. Heating and Cooling Equipment Shipment Data.

## IN THIS ISSUE



26 Yates on PLUMBING



28 Eatherton on HYDRONICS



32 Feldmans on TECHNOLOGY

## PRODUCTS



54 The MAGNA 3 circulator

## NEWS

3 Trucks, more trucks, and vans  
Commercial vehicles shine at Chicago Auto Show.

5 New thinking at the Old Colony  
Housing project introduces efficiency measures.

16 Welcome to your new workforce  
Understanding Generation Y.

Contractors agree: CW is the winning choice.

See page 11 for more details.



# Efficiency is immune to the law of gravity

► **Continued from page 1**

years ago, the old 220 MBH cast iron machine was ready for replacement.

In the years since the first conversion, several mechanical skirmishes were waged upon it, always in an attempt to tame the old system. Some worked, others didn't. At one point, the gravity arrangement was abandoned, but its big, fat piping wasn't. Under-powered circulators struggled to move water through a network of pipes that varied precariously in size from two inches to three-quarters of an inch diameter.

The fluid raced though baseboard, then slammed into massive cast-iron radiators. According to the homeowners, some rooms were suitable for slow-roasting a Thanksgiving turkey, while others were better suited for storing frozen birds. The system barely kept the plumbing safe and the occupants miserable.

When Rich Swatton, president of ModCon Service and Support Inc.,

based in Westford, Mass., first laid eyes on the home in Hanover, Mass., he called it like he saw it.

"It was a flow problem, and a big one, at that," said Swatton. "The circulators couldn't move the water sufficiently, let alone with any accuracy to the places that needed it most for winter comfort."

ModCon is a four-man crew of hydronic masterminds — all of whom shares a passion for the craft. They split their efforts evenly between residential and commercial work. As the name

**'It was a flow problem, and a big one at that,' said Swatton.**

implies, servicing modulating-condensing boilers is the firm's primary focus. In their down-time, they install systems like the ones they service.

Months ago, when they left the farm house after the initial visit, the Mod-

Con crew already had a pretty good idea of what the new system would look like after the overhaul.

"When properly designed, cast iron emitter systems work incredibly well," said Swatton. "The problem is distribution and circulation — and we know how to handle that." He knew the key to success would be dividing the big, single loop of the home into numerous, independent zones.

The 29 radiators needed to be isolated, each with their own flow rates. With a mix of large, vertical radiators,

convection radiators, and cast-iron baseboard, there was no one-size-fits-all flow rate that would accommodate each application of heat. The heat emitters were broken into six zones, each guarded with a 1-in. Taco Zone Sentry zone valve.

"To isolate the radiators, we installed dedicated supply and return units to each one," said Swatton. "But first, the old steel pipe had to come out; all of it." During the first few days of the fall 2012 retrofit, every reciprocating saw that ModCon owns was put to work. All hands on deck toiled to remove the heavy sections of black pipe.

"At times, we had trouble finding all the feeds and returns," said Swatton. "Some were pretty well hidden."

In place of the old pipe, 3,000 feet of half-inch Watts Radiant PEX+ would serve the different radiators scattered throughout the two levels of the home. The orange pipe was far more amenable to being installed than the steel pipe was to leaving.

## Improving on improvement

Once the supply and return piping was completed, and each radiator was isolated, the secret to the flow rate problem came in the form of smart circulators and pre-manufactured, variable manifolds. Six stainless steel Watts Radiant Flowmeter manifolds allowed each of the 29 loops to be individually adjusted for the perfect flow rate.

To best capitalize on the variation that the manifolds provide, two variable-speed, ECM, Taco BumbleBee circulators were installed; each one provides flow for one level of the home via three manifolds. The Delta-T pumps supply the perfect amount of water, regardless of how many or which zones are calling.

"Using the BumbleBee in its Delta-T

mode helped simplify the system by guaranteeing my actual design delta across the zones," explained Swatton. "It matches flow output with heat loss, providing the high level of comfort and energy efficiency I demand on my jobs."

Additionally, Swatton prescribed reverse return piping to distribute the flows and pressures more evenly across the system, making it more balanced.

## Mod-con, naturally

"We've grown to love the Flowmeter manifold, especially for the numerous radiant retrofits we do," said Swatton. "It lent itself perfectly to this job, especially with a variable speed pump, which ramps up and down according to the exact amount of flow we need at any given time. Since we've been in business, we've always specified Taco pumps, not only because the Delta-T design fits well, but because they're American made and stand behind their product."

To get maximum benefit from high-tech pumps and the perfected distribution piping, Swatton wasn't about to finish the system without their namesake trademark. A 160 MBH, modulating-condensing HTP Pioneer boiler is installed in the basement close to the shiny manifolds and yellow pumps. According to Swatton, he wanted to use a boiler with a large water jacket. At 55-gal., the Pioneer makes it easy to supply micro-zones without short cycling the unit.

The five-to-one turndown boiler is factory-equipped with outdoor reset.

"If the outdoor ambient temp is 10°F, then our supply temp is roughly 160°F," explained Swatton. "If it's 60°F outside, we can drop back to 90°F or 100°F supply."

"Regardless of what supply temperature the boiler is putting out," said Frattasio, "domestic hot water has priority. The boiler will ramp up to provide 180°F for the water heater." A 119-gallon indirect-fired tank insures the four-person family won't run out of water, even if the boiler is running full-tilt to heat the home.

"This is a classic New England retrofit, using products manufactured in America, designed specifically for the uniqueness of our systems," he concluded. "There are so many noisy, inefficient, old systems throughout the Northeast. What we've essentially done here is to create a template for anyone who wants the best of both worlds: energy efficiency and the aesthetic appeal of their old cast iron radiators." **G**

## Eliminate scale, lime - and wasted time.

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For information circle 208