

TABLE OF CONTENTS

FEATURES

34 HYDRONICS

Pick a PEX, but not just any PEX
Eric Riml



38 REFRIGERATION

Testing systems to maintain charge
Gino DiFebo

46 TOOL TIP

Drilling the right holes

50 FIND THE FIX

76 PIPING

Powering through pipe threading
Peter Klugman



80 COMMERCIAL CONTROLS

Case study: Saving energy at CAS Toronto
Andrew Snook

86 ROAD WARRIOR: Jimmy Ries

Adam Freill

88 EDUCATION

Literacy in the mechanical world
Carol Fey

92 GUEST COLUMN

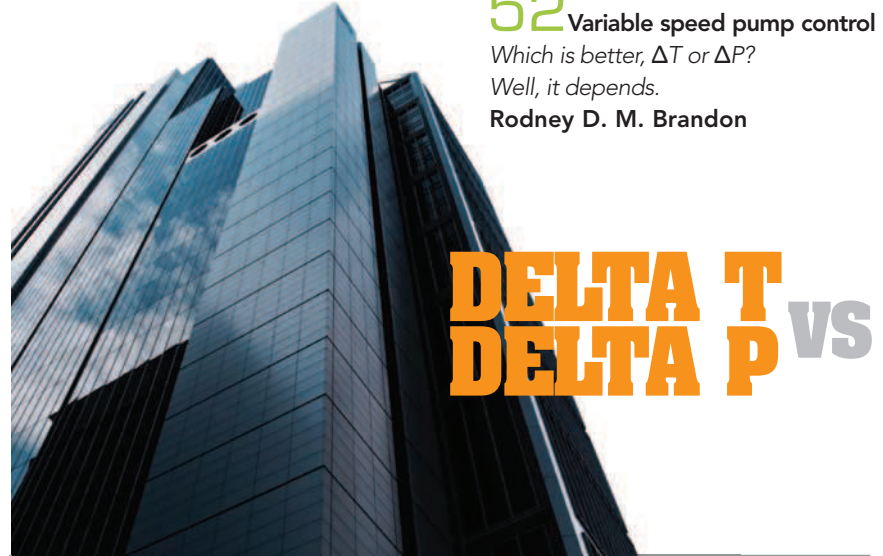
The next 50 years
Kevin Gill

108 HYDRONICS

IAQ and the comfort equation
Nick Pellegrino

114 HVAC/R

Doubling up for savings
Denise Deveau

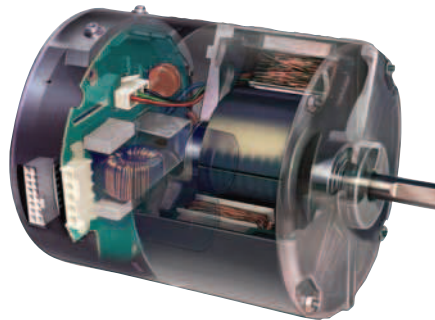


52 Variable speed pump control

Which is better, ΔT or ΔP ?
Well, it depends.

Rodney D. M. Brandon

MATCHING POWER TO DEMAND (AND COMFORT)



98 ECM MOTORS

Whether you call it a DC motor or a variable-speed motor, ECM technology has been around long enough to know that it uses less electricity, which equates to savings for your customers.

Matthew Reid

102 COMMERCIAL WATER HEATERS

Emergency repairs and service jobs happen all the time in this business, especially during busy periods. Often times these sorts of calls result from older equipment, or units that have not been serviced regularly, and either of those scenarios spell opportunity for contractors.

Paul McDonald



DESIGNING FOR THE TIMES

Paul McDonald

DESIGNING FOR THE TIMES

DON'T FORGET THE VENTING

If new, high-efficiency water heaters are planned as a retrofit, existing, single-wall B-vent must be replaced in favour of ULC listed S636 PVC, CPVC or polypropylene plastic.

The majority of venting lines are three or four inches in diameter, precisely matched to the design requirements of new blower motor assemblies that discharge from the top of water heaters.

Plastic vent materials are inexpensive and easy to work with, and yet present no compromise in safety or performance. Some new water heater systems have the ability to vent through the roof and pull air in for combustion through the wall. This is a big advantage. The need to improve flexibility of installation and placement has driven the development of power, power direct vent, through-roof, and side-wall venting options.

Finally, if the application offers abundant atmospheric combustion air, some water heater models do not require balanced venting. A single pipe vent for exhaust may do.



Emergency repairs and service jobs happen all the time in this business, especially during busy periods like Christmas, Easter and any of the other holidays when restaurants, hotels and other such service providers ramp up their operations for the family gatherings and events of their customers. Often times these sorts of calls result from older equipment, or units that have not been serviced regularly, and either of those scenarios spell opportunity for contractors.



On the service side, an emergency call can turn into a long-term maintenance agreement, and that's a good thing. But it does assume that the equipment in question is working efficiently, and is in serviceable condition.

When the equipment is a bit past its prime, or is no longer delivering a cost-effective domestic hot water option, replacement should be discussed with the business owner. And with new equipment, many of these clients will be surprised at the differences between the "old beast in the basement" and today's modern commercial water heating solutions.

Take, for example, a restaurateur who needs half a million BTUs of water heating at the height of his busiest season, and puts an emergency call out to revive his old, leaking water heater – a beast of a machine sized for peak load, making it at least 20 per cent too large 90 per cent of the time.

A big, gas-fired atmospheric system like his could be replaced by a 400,000 BTUH condensing unit that would be smaller in size, a whole lot less expensive to operate and – if need be, and if space is available – could be coupled with a smaller indirect water heater to meet peak loads.

The new water heater will offer a much greater recovery rate, and also be a lot less burdensome to install than the old one, not requiring the large, ducted air vent. A three-inch PVC air intake and a three-inch PVC flue gas discharge is a lot easier to route and navigate, and comes



continues on page 104

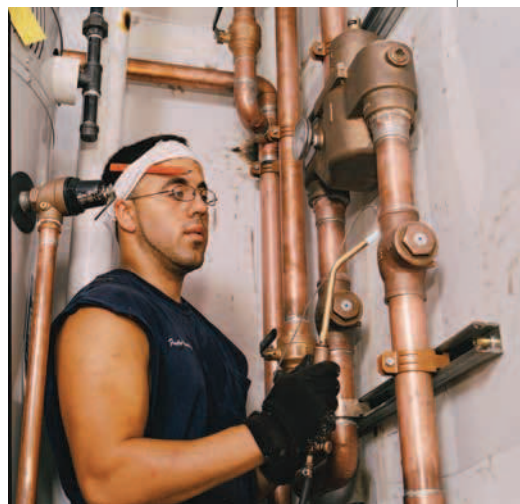
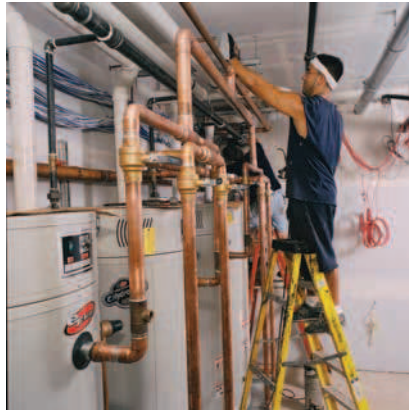
with additional benefits as well.

Sealed combustion eliminates one of the trickiest challenges with commercial facilities where food is prepared. Large ventilation hoods are known for stealing combustion air from atmospherically-fired systems, but that's no longer a problem when the combustion and exhaust air comes and goes directly from outside.

Not long ago, contractors, engineers and building owners were routinely challenged by an inability to easily place and locate commercial water heaters. The limitations of atmospherically-vented systems, facility design, aesthetics and close proximity to other buildings all factored in.

Today it's not uncommon for facility managers to express an aversion to visible venting, based purely on aesthetic reasons, sometimes late in the timing of a project. This is especially true in historic districts.

Fortunately, many of the obstacles to easy placement of water heaters – at least those tied to building design and construction – are overcome with the emergence of new



Neutralizing drain concerns

With modern condensing water heaters, condensate drainage is a likely necessity. Often, fluids to be drained are too acidic for metal drain lines. Routing the condensate through a simple, lime-bed acid neutralizer may solve the problem easily. Better yet, CPVC or PVC drain lines can handle the acidity.

Condensate typically has a pH of 4.0, about that of Coca-Cola – just enough to attack any metal it connects with. Over time, the cumulative effect of exposure to acidic runoff threatens the integrity of the drain lines.



water heater systems, making it much easier to achieve manufacturer-specified combustion air or venting runs (see sidebar “Making a positive change”).

The arsenal of commercial water heater products and associated technology has grown considerably, availing a wide range of fuel, venting and combustion air options. There are also many new application-friendly components and techniques to enable trouble-free specification and installation. However, with the new green systems, a few new needs emerge (see sidebar “Neutralizing drain concerns”).

Higher efficiency, condensing systems are great for end-users in terms of energy consumed, chiefly because they harvest heat from waste condensate. The energy advantage requires modest design and installation changes to meet the need for condensate treatment and drainage, and may translate to an inability to use existing venting, but the benefits far outweigh the costs, especially if the existing equipment is past its best before date.

MAKING A POSITIVE CHANGE

Historic settings are commonly guarded by restrictions that regulate the presence and appearance of modern building systems and attachments (i.e., wire, regulators, transformers and venting), but that is not always a hindrance to selling a retrofit project. In fact, the presence of old and unsightly or loud venting systems has actually encouraged the replacement of aging atmospheric water heaters with more efficient condensing products.

Check the certification

New codes are forcing all of us to be attentive to a broad range of emerging requirements. National, provincial and local codes are changing in the wake of the green movement's more stringent environmental policies and initiatives. Among the applicable national codes is the need for water heater systems over 399,999 BTUH and/or 120 gallon (U.S.) and larger, to be ASME-certified.

