

THE

US

Boiler Report



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REACHING NEW HEIGHTS!



Huntsville, Alabama-based HVAC engineers from NASA evaluate the Alpine and Sage 2.1 control system in a ground-based ISS simulator.



The Alpine Boiler is one step away from ISS Certification.

It has been a very busy year for US at U.S. Boiler Company. This is actually more true now than ever before for our Engineering department. While normally occupied with the refinement of existing boilers and the development of new heating products and control system, they were tasked with a very specific mission...one which gave them the opportunity to show that they really do have "The Right Stuff"

Engineers representing the consortium of nations involved in the International

Space Station Project contacted U.S. Boiler Company to see if there was a plausible solution to a specific problem they were having. Apparently the solar arrays that have been a part of the station from the beginning were having a hard time keeping up with the increasing size of the station itself. Essentially, they weren't able to provide both heat and power for the station's electrical systems. As the energy needs also support life sustaining functions, those systems associated with comfort, like HVAC, typically were viewed as less

important. This made for some unhappy visitors to the station...something needed to be done.

Enter US! We offered the Alpine condensing boiler as a possible backup solution. Many solar-specific buildings in the western United States have installed the Alpine as a supplemental heating source already, so it was something that was familiar to Ej Dohann, newly appointed director of orbital hydronic engineering. "Surprisingly, the boiler

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–“Far Out”, continued

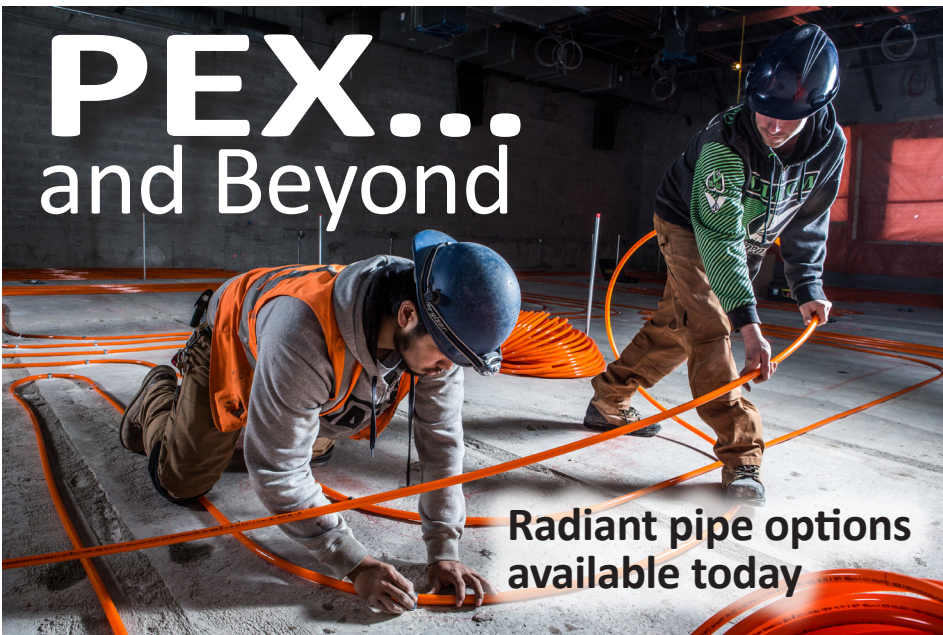
APRIL FOOLS!



Did we have you going?...Maybe a little bit?

OK, yeah... we were having a little fun with this one. While the Alpine boiler is indeed certified for high altitude operation, it would be more than a bit of a stretch for that kind

of installation. Suffice to say, there's plenty more stories of our boilers being installed in slightly less lofty places inside this issue. Read on, and welcome to April.



Radiant pipe options available today

Given the availability, affordable price, and effectiveness of PEX tubing, the other options for hydronic, in-floor heating applications are often overlooked, underutilized, or even go undiscovered. While PEX is

a great general-use product, there are applications where the benefits of the lesser-known tubing materials really shine.

In actuality, there are four types of radiant tubing products on the market

today, each of which has its own respective strengths and weaknesses. Below, we'll explore the options.

PEX

PEX, which stands for Polyethylene, Cross-Linked, is most commonly used with in-slab heating applications during new construction. This pipe is the general go-to option, and works well with wood sub-floor systems as well as concrete. When used as radiant tubing, PEX typically comes standard with an EVOH (ethylene vinyl alcohol) oxygen barrier, helping to ensure anaerobic conditions in a hydronic system.

An extra-low friction layer of Polypropylene not only protects the EVOH and can make installation easier, but in situations where pipe is in contact with other materials - such as conduit, lumber, subfloor or other PEX - this layer acts as a dry lubricant so that expansions and contractions

– Continues, see “PEX”, page 8



US vs. them

I have had about 100 jobs. It's not hard for me to put myself in an employee's shoes, because I have worn out several pairs. Then one day, I became a manager. I crossed a boundary into a foreign land, a place that isolates you from the people who – the day before – had been your comrades, your friends, your brothers and sisters. I went from being one of "Us" to one of "Them."

It has been helpful to remember what it is like to be one of "Us." Here are lessons learned...from painful personal experience as well as empathetic observation of "Them."

"They" should teach "Us" what we are supposed to do.

If someone is going to follow your lead, isn't it reasonable to expect you to know where you are going? Managers are always looking for "self starters" and "people who don't need to be told what to do." Instead, managers could be decisive and inspirational. They could hold themselves and the people who report to them accountable to clear, written procedures. They could be willing to train "Us" on those procedures.

"They" don't let "Us" just do our jobs.

Working with a rudderless manager can be frustrating. But, employment with the overbearing manager is, well,

unbearable. Why hire people if you are going to do everything yourself? You put your employees' job at risk every time you jump in and take over.

What to do?

Consider managing as guided discovery. As the manager, you are responsible for setting goals. Also, you have the right to dictate what behaviors you will and will not tolerate. The goals are WHAT you want to achieve, to have, and written procedures are HOW to achieve the goals. Team "Us" will comply with rules, even if they don't like them, if they understand WHY. If they believe in the manager and the career opportunities. If they feel appreciated and respected. A really cool way to make this happen is for managers and team members to clarify goals, write the procedures and engage in relevant training...together. Time spent in "ride alongs" and "side by sides" encourages good communication and strong relationships.

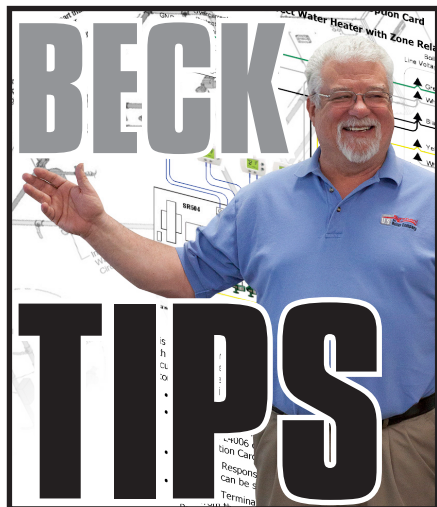
The hard systems – procedures, systems, accountability - are required. The soft stuff – love, purpose, respect, fun – make it all worthwhile. Not everyone will want to work at your company, and some folks who don't comply will have to go. However, if managers make it clear – what you want, why you want it and how to do it – you are going to have less turnover and a better culture.

"We" don't have to be perfect.

A great boss I know shares this with every team member, "You are going to make mistakes. We all do. Sometimes our best moments are recovering from mistakes. Use the procedures because they are designed to help you be successful. But not every situation is covered in the procedures, and some of the procedures may be out of date. This business is a work in progress. So know this: If your behavior is motivated by what is in the best interests of our customers, I will back you up no matter what."

"We" are better together.

A business plan can get you all on the same page! Less stress and drama, MORE MONEY! Download Ellen's free Biz Planning Video Series at: www.BareBonesBiz.com You can also find "ellenrohr" on Facebook, Twitter and Google+.



By Ron Beck,
U.S. Boiler Company

I did. OCP is an acronym for Optional Control Panel. The OCP is included with the Series 3, ESC and ES2 gas water boilers and also the MPO-IQ oil boiler. Even though all our gas-fired, cast iron water boilers utilize the Intelligent Hydronic Boiler Control (IHC), the Series 2 and PVG gas boilers do not the use OCP.

So what's the OCP used for? It's a solid-state control board that has three locations to receive plug-in cards. The IQ Option Panel works together with the control to provide an easy and convenient means to add factory-engineered auxiliary boiler control features. When clicked



Excuse me, did you say OCP?

into the IQ Option Control Panel, IQ Option Cards provide plug-'n-play high temperature limit, low water cut-off and outdoor reset controls. A separate, three-digit LED readout displays settings, status and diagnostic information for all installed IQ Option Cards making them simpler and functionally superior to stand-alone auxiliary controls. IQ Option Cards are available for the following features:

- Outdoor Air Reset with Domestic Hot Water Demand
- Auxiliary High Temperature Limit (available in auto reset or manual reset versions)
- Low Water Cut-off (available in auto reset or manual reset versions)

The cards are designed to save labor and material costs. When a card is plugged into the OCP, the card parameters and card location are automatically received by the IHC boiler control and put into memory.



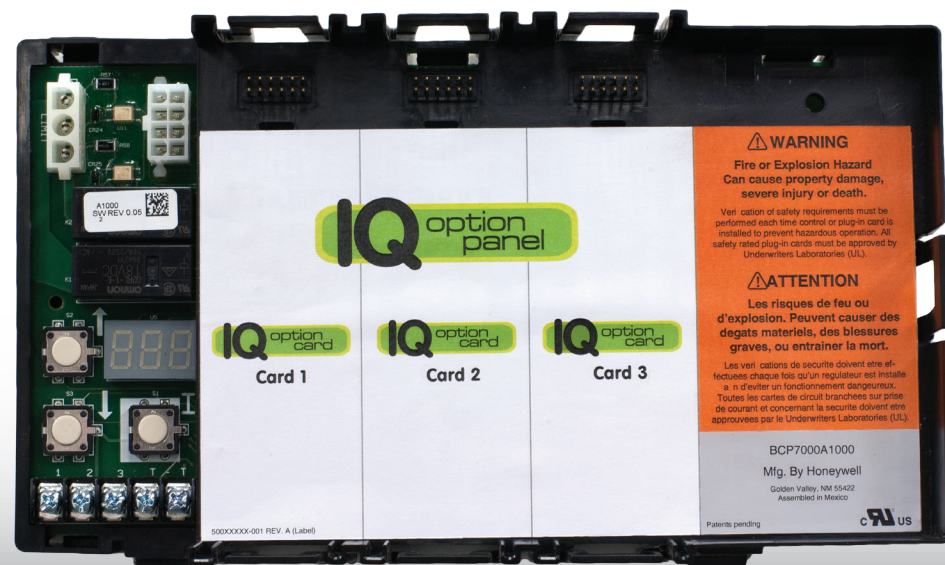
The cards have a tab on all four corners and the OCP card slots have channels to accept the tabs. The proper way to install these cards are to line up all four corners and slide the card straight in. Sliding the

card all the way in will make contact to two rows of pins. I do not suggest installing the card bottom first, then pushing the top in, as it could potentially bend the contact pins. By using the straight-in approach, you avoid this.

The OCP will display any problems with the cards using a card slot number and error code. Utilizing the "I" button and up and down arrow keys you will be able to view and change parameters on any card installed on the OCP. Depressing the "I" button when one or more cards are installed will display C1, C2 and/or C3 only if there is a card plugged into the OCP. If there are no cards and you scroll with the "I" button the display won't show any card locations. The cards can be installed in any of the spaces, and order is irrelevant. Once you gain card access, you can view the card information using the "I" button again.

If you want to change any card parameter you would press and release the "I" button until you see the proper card location designated by "C#", then press one of the arrow keys. To gain access to the parameters, you will have to press "I", up arrow and down arrow buttons all at the same time until the underscore appears on the right side of the display. Next, scroll through the parameters with the "I" button and make changes with the arrow keys. Press the "I" button to scroll to the next parameter and the parameter change will automatically be saved. When changes are completed, keep pressing the "I" button until the display shows "bAc" which means back or exit. Pressing one of the arrow keys will take you back to the OCP, removing you from the programming mode.

Over the next few months I will discuss the individual option cards and their use.





Divide and Conquer!

The Botto Brothers, Roger (left) and Hunter, own the appropriately-named company in Hicksville, NY.

Long Island's rich hydronic heritage can be seen in the houses that cover the island, as well as the plumbing and heating shops that serve them. Common is the moderately sized, turn-of-the-century house that's seen addition after addition, with as many changes to the heating system. The family-owned hydronic shops run by passionate "wet-heads" continue to leave their mark on the heating landscape.

Hunter Botto will be the first to attest to this. He and his brother, Roger, are third generation owners of Botto Bros. P&H, in Hicksville, NY. Their grandfather started the company in 1937, and they purchased

ownership in the 80s. Today, it's a 10-person, multi-faceted firm that's commercially and residentially focused. Plumbing and heating is their bread and butter, but kitchen and bath remodels and generator installations keep them busy year-round.

"One thing we've found is that diversifying helps build a bigger network of clients," said Hunter. "We'll land a remodeling job, and later in the year they'll call us back to service a boiler or install a generator."

In early February, Botto technicians were completing a generator installation when the owner asked them to check their radiant



heating, and if a gas \$1,400 gas bill was normal for a 3,500 square-foot home in January. When they stepped into the home's mechanical room, what they found was so bizarre that they texted Hunter a bunch of photos.

Steam to radiant disaster

The circa 1910 house had been expanded and

– Continues, see "Conquer", page 6

–“Conquer”, continued

remodeled a number of times, with the the heating system constantly gaining complexity. The original cast-iron steam radiation was accompanied by a jumble of air handlers and two different in-floor systems, none of which operated properly. The floor didn't heat well, and the two-pipe steam system was banging. Oddly enough, the entire system was served by one oversized steam boiler.

“I had to check it out myself,” said Hunter. “The boiler – which was 20 years old – was twice the size it needed to be. There was no proper equalizer; the four-inch header went right into the boiler, and three, two-inch supplies Teed off the big main. But it gets better.”

“Instead supplying DHW, the steam boiler's internal coil was piped out to a 30-gallon buffer tank – which was just an old indirect-fired water heater. A circulator moved water from the tank to two radiant supply manifolds; one which supplied PEX under the marble kitchen floor, another for a staple-up zone in the dining room. The PEX didn't receive the flow or temperature it needed. DHW was supplied by an old gas-fired water heater, and an upstairs den was heated by a single gas-fired air handler.”

During Hunter's visit, the homeowner decided she wanted to lower her fuel bills and restore heating function by replacing the system. To hold her over for a few weeks until they could design and install a

new system, Hunter de-rated the existing boiler to 50 percent of its 300,000 BTUH capacity. He then completed a heat load calculation in the rooms with radiant heat, and measured the radiators.

Share the load

“Instead of converting the radiators to water, we decided to divide the load between a new steam boiler and a new water boiler,” said Hunter. “We started on February 17th and finished five days later. The homeowner headed to Costa Rica during the process, which made life easier for us.”

Once the old boiler was removed, Botto Bros technicians Mike Depaulis, Bryan Scheafer and Brian Single installed a 105 MBH, natural gas-fired Burnham ES2 water boiler. The unit now supplies DHW via a 50-gallon, Burnham Alliance indirect-fired water heater, and working heat for the in-floor system.

“The ES2 is a real workhorse,” said Hunter.

“Efficient, easy to install, and ridiculously dependable. What else do you want from a boiler?” Updating the radiant system included the addition of a pump; one for each manifold. Mixing valves are now used to temper down the 180°F supply temperature. The kitchen supply temperature averages 115°F, while the dining room – with wood floors – requires 140°F.

After the water side was



A Burnham Independence supplies steam to cast-iron radiators, while an ES2 heats in-floor zones and DHW via a Burnham Alliance sidearm tank.

squared away, they turned their attention to the radiators. Any air vents were removed, and supply valves were replaced. Next to the ES2, a 140 MBH Burnham Independence was installed for the 310 square feet of connected radiation.

Worthwhile affiliations

Hunter is a 15-year PHCC member who has served as local and state president, and has been on the National PHCC Board of Directors. Currently, he serves as the local Zone Director.

“PHCC has allowed me to have open communications with contractors from all around the country,” said Hunter. “Over the years, their guidance and recommendations have proven an invaluable asset to have.”

He also attributes much of the company's success to manufacturer's representative, VENCO Sales. Their staff is always ready to share their expertise.

Warm welcome

Hunter started working with his dad at 12 years old, so when he went into the Navy after high school, marine boilers weren't so foreign. The skills he learned while enlisted built his knowledge base as a steam mechanic; skills he's still using every day.

“We couldn't promise the owner of this job tropical weather upon her return, but a comfortable house and a lower heating bill were a given. The project even qualified for a 900.00 dollar rebate from National Grid, the local utility,” said Hunter. “The most gratifying part of my job is delivering solutions. Burnham products have been a part of that for Botto Bros. since before I joined the business.”

The Botto Legacy continues today, with a long wake of happy customers behind them. A recent, late-evening email to Hunter's iPhone read, “Back from Costa Rica. Feet are warm!”



Tips for Effective Email Marketing

by Mark Vogel • President, Vogel Marketing Solutions LLC

We all use email – it’s as ubiquitous as the phone. But there is one point to make clear:

Email is NOT email marketing.

An “email” is simply a single message sent to one or more people using popular platforms such as Gmail or Outlook.

“Email marketing”, on the other hand, is a commercial message sent through a separate software program to a larger group of recipients with the intention of growing sales, building loyalty or enhancing brand awareness.

You may ask, “Why not just send those messages through Outlook?” You can risk your online reputation if multiple recipients label your messages as “spam.” Once your email is blacklisted by groups such as Spamhaus, your ability to communicate via email could be compromised. Using an inexpensive program such as MailChimp, iContact, Constant Contact, Campaigner and others help provide a level of protection.

Those programs can help you measure your ROI. How many received the message? Did they open it? Did they click through to your website? These programs also provide easy-to-use templates to

help visually brand your message with your logo, colors, images of your service vehicles, and so on.

Finally, these programs help protect you from violations of the CAN-SPAM laws. If someone wants to unsubscribe, you must provide that ability in the simplest manner possible. Also, don’t forget to include your street address in the footer of the message – it’s a requirement.

Why is email marketing a vital tool? Whether your target audiences are consumers or businesses, here are a few of the benefits:

Cost-effective: according to the Direct Marketing Association, email marketing has the highest ROI of all direct media by a wide margin – currently \$40 for each dollar invested.

Popular: email use isn’t declining (despite what some claim) – the number of email addresses grew from 3.1 billion in 2011 to 3.6 billion in 2013. Two-thirds of consumers prefer email communications from businesses over other means.

Relevant: you can personalize the message with the recipient’s name, and deliver different messages based on their profile – for example, send business-related content to your commercial clients, or send a cross-sell / up-sell message on indirect-fired

water heaters to former customers who purchased a boiler.

Measurable: unlike direct mail, you know if the message was delivered, if they opened it, and if they followed your call-to-action.

Automated: depending on the software, you can program specific messages to be sent based on the recipient’s profile – happy birthday messages, “one year since your new central air unit – how do you like it?”, “how was our service at last week’s service call,” and so on.

One of the biggest challenges is the database. You can’t send an email if you don’t have an address!

Do you have an up-to-date Master Database of customers and prospects? If not, start the process **NOW** to develop it. Make sure that at every touch-point with the customer – on the phone, during service calls, and on the invoice – you are asking for their email address. Promise them that their address will NEVER be shared or rented, and that they can unsubscribe at any time.

Give incentives to sign-up, such as a discount on the annual service contract in exchange for their email. Put

sign-up forms on every page of your website. How much would you save if you could convert the telephone calls to your entire customer list into an automated email marketing program?

Best-practice email marketing is an important component for every business – regardless of whether your target audiences are consumers, businesses, or both. Integrate it into all your marketing activities, and you’ll see an excellent return on your investment over time!



Mark Vogel, of Lancaster PA, founded Vogel Marketing Solutions LLC in 2007. He has more than 30 years of experience in marketing leadership positions with ad agencies, corporations and small businesses. Today, he specializes in email marketing, social media and Internet marketing. He can be reached at 717.368.5143 or Mark@VogelMarketing.net.

– “PEX”, continued

of the pipe are much quieter. High-temp or low temp doesn't matter, most PEX products are rated to 200°F, and below freezing, when filled with adequate anti-freeze.

“However, the EVOH oxygen barrier has a much lower temperature tolerance,” said Rich McNally, Senior Sales Manager at Watts Eastern Region. “So if you want an oxy barrier, use it under 180°F.”

PEX is typically available in sizes from three-eighths of an inch to four-inches. Retrofitting with PEX can be a challenge due to its lack of flexibility.

PE-RT

Meet the younger cousin of PEX... PE-RT, or Polyethylene-Raised Temperature, is the newest radiant piping on the US market. Although it's been marginally popular in Europe for over a decade, it didn't make its debut here until about five years ago. PE-RT, like all heating PEX, has an EVOH oxygen barrier, but it's not cross linked, resulting in increased flexibility.

PE-RT is sold in sizes from three-eighths to one-inch diameter. Made of a completely different polyethylene formula than PEX, PE-RT's material

is stable enough without requiring the cross-linking process. Most PE-RT precuts are rated to 180°F.

EPDM

EPDM (ethylene propylene diene monomer) tubing – known in the trade as Onix, is cross- linked synthetic rubber, wrapped with a ductile aluminum barrier and encased with another layer of black rubber. EPDM tubing for radiant applications is exclusively offered by Watts Radiant.

Unlike the plastic pipes, Onix is then fortified with 1000 denier aramid cord. This virtually indestructible cord is used in body armor, and can tolerate temperatures up to 1000°F.

At installation, Onix is impervious to the temperatures found in the lower 48 states; -30°F is no concern, it remains as flexible as you are. Onix comes in three-eighths to one-inch diameters. Its best traits are its near-bullet proof construction and incredible flexibility. This makes it perfect for retrofits, reaching into tight places, like between floor joists.

Although Onix itself costs more than PEX, it doesn't require aluminum conductive plates, so the per-square-

foot cost is less than- or equal to a PEX under-floor system.

Composite

Composite tubing consists of two PEX layers sandwiching a thick, no-joke layer of aluminum oxygen barrier. To eliminate noise during expansion, the pipe is also covered with a low-friction exterior layer.

Because the aluminum layer maintains its shape after it's been bent, some contractors prefer it. When installing, this can be helpful because the pipe stays where it's put. The downside is that if the pipe is bent too far, the aluminum will kink.

Although some use it for radiant jobs, composite pipe is really best suited to hydronic transmission lines, such as piping air handlers or baseboard. Its linear expansion is very similar to copper, so it lends itself well there.

Picking the tubing that best fits your application will make any job easier and more profitable. Before choosing a tubing product however, consider how you'll install it. Today's broad array of installation techniques and products – from gypcrete to subfloor heat transfer plates - can make in-floor heating an option for nearly any application.

The Toolbox...Re-Loaded!



As many of you are likely aware, we recently re-introduced our website with a fresh design and increased functionality. One of the items that was still kinda stuck in the “old days” was the venerable “contractor toolbox”. This page was/is a collection of handy calculators and forms that most any

contractor would appreciate having at their fingertips. The new versions are very similar to their older counterparts, but some offer additional functionality, like the ability to print out the findings of the calculated forms directly from the page. The “tools” on this page consist of a heat loss calculator, sizing obsolete

radiation, a unit of measure converter, boiler registration link, and a “find a distributor” search feature. If you'd like to see these tools for yourself, please visit: <http://www.usboiler.net/resources/contractor-toolbox-calculators.html>

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