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NEWS

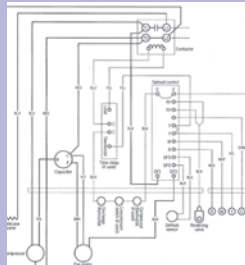
THE WEST'S LEADING MONTHLY NEWSMAGAZINE FOR THE AIR CONDITIONING, HEATING, REFRIGERATION, SHEET METAL AND VENTILATING INDUSTRIES



Editorial Focus

What's new? Find out here as ICN takes a look at the latest offerings in Indoor Air Quality, Zoning and Air Distribution Products.

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Troubleshooting

In this month's troubleshooting situation, we have an elderly customer in immediate need of assistance.

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Indoor People

ICN puts the spotlight on the movers and shakers in the heating and air conditioning industry.

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Indoor People

Johnson Controls Launches Several Initiatives to Support Women in HVAC

The number of women in the workforce reached a record high in 2023. Yet, the U.S. Bureau of Labor and Statistics reported that only 10% of mechanical engineers and only 2.3% of HVAC mechanics and installers are women. As the HVAC industry continues to evolve, Johnson Controls believes a diverse workforce that empowers women is crucial for continued growth.

"As a woman business leader and engineer, it is extremely exciting to see the increasing numbers of women STEM graduates," said Lei Schlitz, vice president and president of global products, Johnson Controls. "The industry has made significant advancements in recent years, but as we look to the future, we need to continue to tap into the greater pool of talented women professionals who are our next-generation business and functional domain leaders."

To support the advancement of women in HVAC, Johnson Controls has launched several



CHRISTYN MUELLER OF JOHNSON CONTROLS.

initiatives, including the Women's Global Network and the Rise Up: Women in Leadership Program, which explores the unique issues women face in the workplace and aims to enhance women's leadership skills through sessions focused on personal development. These sessions cover topics including "Rocking Your Confidence," "Owning Your Career" and "Networking." The company's Women in Engineering and Women in Controls programs also target opportunities to bring women into

Continued on Page 22

Industry Education

Making Cents of SEER, Estimating Lifetime Savings with a Higher SEER Air Conditioner

By Mitchell Bailey
Bailey's Heating & Air, Inc.

In my last article we compared the cost to run a heat pump as opposed to a 90+ furnace. In that article we compared COP to AFUE and the cost to make a million BTU's when using natural gas and when using electricity. The savings were pronounced, and it really pencils out for customers to switch from a gas furnace to a heat pump based on their utility rates and what it cost per therm of natural gas. What about the air conditioning side, how do we show savings compared to the old system to a new system?

Actually, we can calculate fairly accurately an approximate savings per season and then calculate the savings over the system lifetime which for an air conditioner is 15 years. We



need four things, the size of the old system, the cooling degree days for the location, the estimated SEER of the old system, and the average cost per kilowatt from the utility company. For the new system we need the same four things. This is the formula we are going to use:

$$\frac{\text{Size in BTU's/h} \times \text{Cooling Degree Days Per Season} \div \text{SEER} \times \text{Rate/Kilowatt} \div 1,000 = \text{Cost per Season}}$$

All we have to do is assemble our numbers to calculate the savings using the following to obtain those numbers.

1. Size is easy, we can get that from the model number of the equipment, for example a D&N model number 565BJX060 is a 5-ton unit which is 60,000 BTU's.

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IHACI 2024

Training Classes

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for more information.



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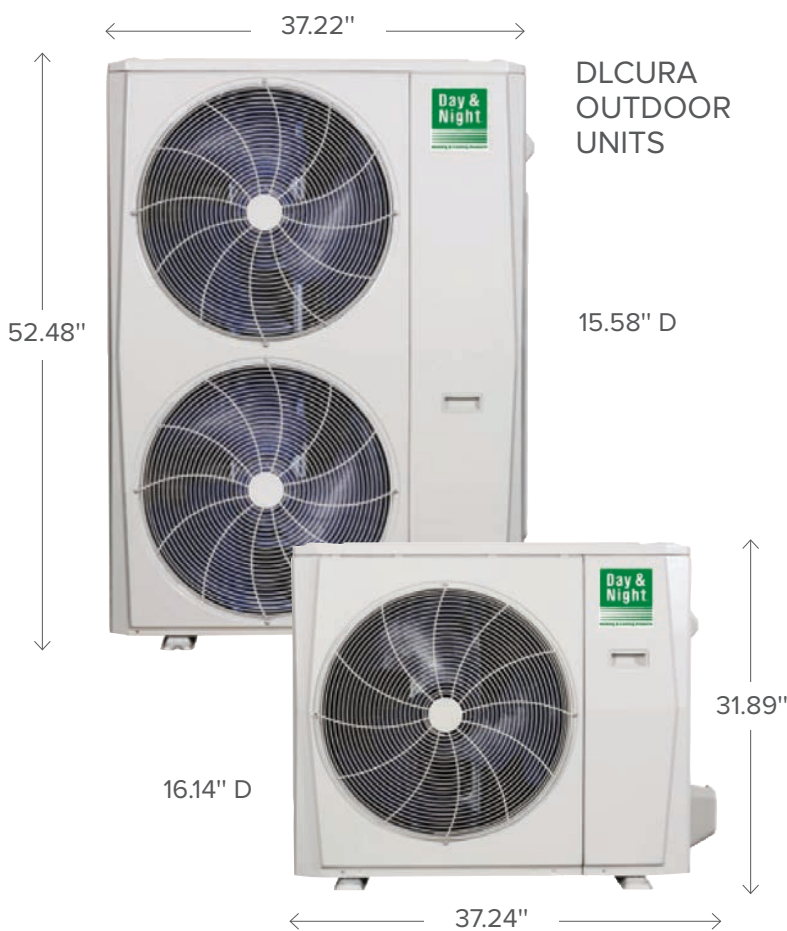
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CALIFORNIA



Arch Raises \$6.2M to Boost Heat Pump Adoption

San Francisco, Calif. – Arch, a company with a data intelligence platform for HVAC contractors, has raised \$6.2 million in seed funding from Gigascale Capital, Coatue, Floodgate, ReGen Ventures, and MCJ Collective.

The investment comes as many Americans want to electrify their homes but face high upfront costs and a shortage of qualified installers. Arch aims to ease those issues by transforming the sales process and making heat pumps the obvious financial and performance choice for contractors and homeowners, the company said in a press release.

The company will use the funds to grow its engineering team and expand its customer base in the Northeast and California.

Contractors typically face time-consuming sales processes and low conversion rates, spending 80% of their time on leads that won't convert, a cost shared across every installed heat pump, the Arch press release said. Arch's system of intelligence for revenue

generation integrates data from over 12 sources and uses proprietary algorithms to offer intelligence beyond workflow automation, the company said.

The platform enables contractors to quickly analyze homes, optimize heat-pump systems, and will soon include savings calculations. With these insights, Arch will unlock competitive point-of-sale financing and further boost contractors' sales, the press release said.

"I was a solar installer myself, have been on the road with contractors, and know how frustrating it is to invest time upfront and miss out on a sale," said Phil Krinner, co-founder and CEO of Arch. "Heat pumps are currently a black box. By providing insights to contractors, homeowners, and financiers, we're helping them translate heat pumps into a financial

opportunity."

Electric heat pumps are out-selling gas furnaces as consumers navigate roller-coaster energy prices and increasingly frequent heatwaves, and take advantage of federal, state, and utility incentives. The technology cools and heats with significantly lower carbon emissions compared to traditional air-conditioners and furnaces that rely on fossil fuels.

Rewiring America's analysis suggests that the Inflation Reduction Act (IRA) can provide American households with an average of \$10,600 for full electrification, saving them an average of \$1,800 annually on energy bills. In September 2023, a coalition of 25 states, representing 55% of the U.S. population, committed to installing 20 million residential heat pumps by 2030. The International Energy Agency estimates that the U.S. must invest \$160 billion annually by 2030 to meet its goals.

Arch is designed to help contractors capitalize on increasing demand by making their work more efficient. The platform cuts down the time spent on paperwork, site visits, and creating estimates, the company said.

Once a system is designed, the goal is for contractors to use Arch's savings forecasts to provide homeowners with a clear view of a heat pump's long-term return on investment. Additionally, Arch plans to provide its insights to lenders to unlock the industry's most competitive point-of-sale financing, the company said.

"Sitting next to the best of the best, sharing our successes and failures, is powerful," said Chris DeMers, director of operations at CMC Corporate Solutions in Baton Rouge, Louisiana.

The forum kicked off with a presentation on leadership by Craig Woodall, a senior consultant at Grinnell Leadership. Woodall spoke on the importance of open communication, maintaining a positive culture, and more.

"He did a really good job with providing actionable steps instead of just highlighting general issues," said Andy Gura, HVAC service supervisor at Blauch Brothers Inc. of Harrisonburg, Virginia.

Day two was full of panel discussions. A panel on recruiting and retaining employees, led by Derren Saucier, senior vice president of Temperature Inc. in Memphis, Tenn., covered characteristics to look for in new hires, successful retention programs, team bonding experiences, and more.

Other panelists included CMC Corporate Solutions service manager Daniel Gauthier, Cox-Powell Corp. vice president of operations Mike Kerner, Dean E. Norris Inc. director of service operations Erick Wheeler, B&I Contractors southwest service manager Jason Walker, and Blauch Brothers' Gura. Members ended the night with a competitive ping-pong tournament.

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ServiceTitan, Lennox Form Partnership

Richardson, Texas – Lennox and ServiceTitan have agreed to a partnership that establishes the software company as Lennox Residential HVAC's exclusive field service management (FSM) provider.

The agreement provides both organizations with mutual customer access to a range of functions that help drive efficiency and enhance the customer experience, according to a press release from Lennox.

"Lennox has a proven history of product advancement and digital innovation. Our collaboration with ServiceTitan underscores the shared dedication to equipping dealers with tools that streamline workflow and elevate the customer experience," said Gary Bedard, president of Lennox Home Comfort Solutions. "We're

Continued on Page 6

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TEXAS



HVAC Contractors Network at Service Management Forum

Austin, Texas – HVAC professionals from around the country attended the Service Management Forum, three days of networking and learning, at the Hilton Austin in January. The conference was organized by the Unified Group, an association of independent commercial HVAC contractors.

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Continued from Page 4

confident the innovative features that ServiceTitan offers, coupled with the strong product and service offerings Lennox provides, will empower dealers and support our customers amid growing demands.”

The partnership will allow Lennox dealers who use ServiceTitan to access Lennox product content and real-time pricing and availability and place electronic purchase orders from within the software. Lennox and ServiceTitan will also develop and launch a comprehensive Lennox Package complete with prebuilt customizable sales proposals, on-the-job checklists, marketing campaigns, lead integration through the Lennox dealer locator, Internet of

Things (IoT) leads, and the management of consumer rebates and warranty registrations, the press release said.

A key component of the partnership is the support provided to mutual customers, Lennox said. In addition to the planned integrations, Lennox customers will have a support channel through ServiceTitan to further assist them with any needs.

“Prioritizing customer retention and revenue growth is key for contractors nationwide, so identifying opportunities to streamline operations is crucial,” said Vahe Kuzoyan, co-founder and president of ServiceTitan. “Our new software-focused partnership with Lennox provides businesses the tools to achieve their goals and deliver best-in-class customer service.”

Texas Brokerage Named HVAC Industry Expert

McKinney, Texas – Maverick Business Advisors, a business brokerage specializing in trade businesses like HVAC, plumbing, and electrical, has been named an industry expert for HVAC in the Business Reference Guide, published by the Business Brokerage Press.

The guidebook is regarded as the world’s foremost business pricing guide, offering guidance to brokers worldwide on how to value businesses in specific industries.

Maverick Business Advisors was founded by Steven Remy, a third-generation entrepreneur. Remy has built expertise in negotiations, marketing, and business operations, and

has a military, law enforcement, and business background that further enhances his effectiveness as a broker, a press release from Maverick said.

Maverick has carved a niche in trades such as HVAC, plumbing, and electrical services. The company also has expertise when it comes to home services businesses and agricultural businesses like plant farms, nurseries, and more, the press release said.

Maverick’s professional team makes an effort to understand the specific requirements and goals of every client and focuses on offering them personalized solutions that yield the best results. Its team of examiners, auditors, analysts, and attorneys reviews all business and financial data to help clients understand the health and market-

ability of their companies, Maverick said.

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Taco Pump Facility Opens in Lubbock, Texas

Lubbock, Texas – Taco Hydroflo Pump Solutions has opened a new state-of-the-art facility in Lubbock, Texas. The site opened last February, and substantially expands the operations of the Taco Family of Companies. Taco is headquartered in Cranston, R.I.

Hydroflo’s new 45,000 square-foot location in Lubbock is in the manufacturing and transportation hub of northwest Texas, 40 miles north of its prior location in Brownfield, Texas. With the new facility also comes the advantage of added space for future growth, additional capabilities and team expansion.

“The opening of this new Taco Hydroflo Pump Solutions facility signifies a renewed focus on ensuring that our customers have access to the most dependable high quality vertical and submersible pumps in the market,” noted Cheryl Merchant, President and CEO, Taco Family of Companies. “Our investment in the infrastructure, testing equipment and expanded workforce is just the beginning of the next phase of the Hydroflo story.

“I would like to extend my thanks and gratitude to our new landlord, Randy Teinert, the City of Lubbock, and the Lubbock Chamber of Commerce,” continued Merchant. “Family is at the core of everything we do at Taco, and I want to thank all of you for making us feel like family. Your warm welcome to this community has made all the difference.

“The Hydroflo team, along with the more than 1,200 Taco team members, are leading us into the future,” she added. “A future of opportunity, a future of growth and a future of well-earned success.”

According to Hydroflo’s Director of Sales, Clay Williams, the facility substantially expands their manufacturing, warehouse and quality control operations. New manufacturing equipment was purchased for the facility, and a state-of-the-art test pit have expanded their testing capabilities as well.

“The new test pit is much larger and deeper and greatly

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improves our range of testing,” explained Larry Jones, Hydroflo V.P. “We now have the ability to test all current pump models, something we previously had to outsource.”

Hydroflo manufactures a wide range of submersible turbine, vertical axial-flow, vertical mixed-flow, and vertical turbine pumps for use in the agricultural, commercial, industrial, municipal, marine, mining, and power generation markets. The company uses high-quality ductile iron discharge heads and fabricated steel or 316 stainless steel L, F, and T style heads. Ductile Iron bowl castings with impellers in 201 stainless steel impellers are also used for greater strength. For applications that require resistance to corrosion, Hydroflo offers castings and impellers in 316 stainless steels in order to provide the best materials of construction to meet specific application needs.

Taco Hydroflo Pump Solutions is an integral part of the Taco Family of Companies, an expanding global network of industry-leading brands that strive to be the first source for durable, high-efficiency heating, cooling, plumbing and fluid-control solutions that help its customers save money, energy and resources while maximizing comfort and productivity.



TACO OFFICIALS AT THE NEW HYDROFLO PUMP SOLUTIONS PLANT RIBBON-CUTTING CEREMONY IN LUBBOCK, TEXAS.

ignation is consistent with who we are and always have been. While it's a new recognition, it's not a new concept for A.O. Smith.”

A.O. Smith is marking its 150th anniversary this year; the company was founded in 1874 by Charles Jeremiah Smith.

The World's Most Ethical Companies assessment is grounded in Ethisphere's proprietary Ethics Quotient, an extensive questionnaire that requires companies to provide more 240 different proof points on company culture, including its environmental, social, and governance (ESG) practices; ethics and compliance program; diversity, equity, and inclusion; and initiatives that support a strong value chain. That data undergoes qualitative analysis by Ethisphere's panel of experts, who spend thousands of hours vetting and evaluating each year's group of applicants.

“Through the rigorous review process, we see the dedication of these organizations to continually improving their ethics, compliance, and governance practices to the benefit of all stakeholders,” said Erica Salmon Byrne, chief strategy officer and executive chair at Ethisphere. “Companies that elevate best-in-class cultures of ethics and integrity set a standard for corporate citizenship for their peers and competitors to follow.”

A.O. Smith's values and guiding principles have steered the company throughout its 150-year history and helped make it the thriving organization it is, the company's press release said.

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Trane, Ohio District Collaborate on School Upgrades

Davidson, N.C. – Trane Technologies is collaborating with the West Branch Local School District in Beloit, Ohio, on a multi-phase, energy-saving infrastructure project.

The district is undertaking major upgrades of three of its build-

ings: West Branch High School, West Branch Middle School, and Damascus Elementary. The upgrades are designed to replace outdated systems, address deferred maintenance, reduce energy and operational costs, and help create a more comfortable academic environment, according to a press release from Trane. They are expected to save the district more than \$200,000 in energy and operational costs annually, according to the press release.

Improvements will include HVAC equipment replacement, new LED lighting, and a thermal energy storage system. That system's ice tanks will act as a battery for a building's air conditioning, allowing the district to shift the electrical demand for cooling to off-peak, nighttime hours. The upgrades are already under way and are expected to wrap up early 2025.

The improvements were funded through a combination of federal Inflation Reduction Act money and a performance contract from Trane. The performance contract enables the district to pay for the upgrades with the savings achieved through future reduced energy consumption. Performance contracting is a funding option that provides measurable results to support educational objectives, Trane said.

The West Branch Local School District serves about 1,850 students in preschool through the 12th grade.

The district and Trane are also collaborating to bring two STEM (science, technology, engineering, and mathematics) learning programs to West Branch students beginning in the fall of 2024.

BTU Crew is designed to help create a foundation for STEM learning among students in grades four through seven, and then bring it to life for students in grades eight through 10. The program turns schools into energy learning labs with integrated lessons and project-based activities.

Students enrolled in the district's industrial maintenance

program will be able to participate in data analytics education that leverages energy-usage data from the district's controls system to offer hands-on STEM learning experiences. The practical skills gained through this education will help bridge the gap between classroom instruction and the needs of the workforce, the Trane press release said. It will also prepare students for two data analytics certifications through the National Coalition of Certification Centers, which will allow those students to earn additional third-party, industry-recognized credentials.

These programs support Trane Technologies' commitment to creating pathways to green and STEM careers in support of its Sustainable Futures program, the company said.

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PHCC Announces New Scholarship Opportunities

Falls Church, Va. – This year, the Plumbing-Heating-Cooling Contractors – National Association (PHCC) Educational Foundation scholarship program plans to award 55 scholarships totaling \$132,000. Awards are available to plumbing and HVACR apprentices working for PHCC – National Association members, trade school or community college students taking plumbing or HVAC classes and college students pursuing majors directly related to the plumbing-heating-cooling industry.

The Foundation's is proud to announce the addition of two new awards for 2024:

- Gil Meyerowitz Memorial Scholarship – The Meyerowitz family runs several supply houses in New York, plus the national SupplyHouse.com site. Gil Meyerowitz was the owner of Meyerowitz Supply in Queens. When he passed away in April 2023, a portion of his estate was allocated to funding veteran scholarship awards through the Foundation. Beginning this year, a \$3,000 scholarship will be available to qualified applicants who are also a United States Armed Forces veteran; a current or former National Reservist or a member of the National Guard.

- Ferguson Cares HOLA Scholarships – The national supplier Ferguson provides their associates with ways to support their interests through its internal Business Resource Groups (BRGs). Ferguson Hispanic and Latin American

(HOLA) BRG members support organizations that focus on the educational development of individuals within the Latino community, particularly those involved in trade work. This year the Ferguson Cares Foundation is providing funding to support four new \$1,500 scholarships, which will be available to qualified Hispanic or Latino applicants.

All applicants are required to answer a few questions about their interest in the trades and career plans, plus provide a letter of recommendation. Apprentices can get that recommendation from their PHCC member contractor employer, while trade school or college students can have an instructor or guidance counselor write their recommendation. Awards range from \$1,500 to \$10,000; with the most awards set at \$3,000 each. The deadline for all submission materials is May 1 and the application can be found at <https://phccfoundation.org/scholarships>.

“Our scholarships are designed to help open opportunities for those interested in a plumbing and HVAC trades career,” said John Zink, Foundation V.P. of Development and Communications. “For many otherwise qualified individuals or their potential employers, the cost of apprenticeship tuition or a trades-related college degree is a roadblock. This year our scholarships, including the new awards we are rolling out, will help over 50 future tradespeople overcome that funding problem and have their chance at starting a great career.”

The scholarships are funded by contractor donations to the PHCC Educational Foundation and by these corporate sponsors: A. O. Smith, Bradford White Corporation, Delta Faucet Company, Ferguson Cares Foundation, InSinkErator, RIDGID, Scorpion Home Services Marketing, State Water Heaters, Sterling (a Kohler Brand) and SupplyHouse.com.

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Rheem Hosts Women in HVACR Regional Event

Roswell, Ga. – Recently, around 50 participants from across the country came together in Roswell, Ga., at Rheem's Innovation Learning Center, for the Women in HVACR Regional Event. Hosted by Rheem Manufacturing, Live Oak Bank, Hawkins HVAC Distributors Inc., and supported by proud partner Women in HVACR,

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NATIONAL



A.O. Smith Makes List of World's Most Ethical Companies

Milwaukee, Wisc. – Water heater and boiler manufacturer A.O. Smith Corp. was recently recognized as one of the 2024 World's Most Ethical Companies by Ethisphere, a global leader in advancing ethical business practices.

This marks the first time A.O. Smith has been given the Ethisphere award over its 18-year history. The company was among more than 135 other honorees in 19 countries and 46 industries.

“We have long believed our culture – namely our values and guiding principles – is a differentiator for our employees and customers, and this award recognizes that fact,” said Kevin Wheeler, A.O. Smith's president, chairman, and CEO, in a press release. “This des-

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Continued from Page 8

the networking event was the first of its kind in Atlanta.

Designed to foster collaboration and professional growth for women in HVACR, event attendees included a dynamic mix of field technicians, contractors, distributors, suppliers, service providers, manufacturers, educators and professionals from every corner of the industry. The success of this event marked a significant milestone for women in the industry in Atlanta and set the stage for a future focused on advancing diversity and excellence in the wider HVACR community.

Presenters at the event included top talent at Rheem, with Becky Kelly, district sales manager southeast region, and Makenzi Roberts, content and communications marketing manager and Live Oak Bank's Jordan Cordero, loan officer service contractors. Together, these three presenters shared the latest on the evolving HVAC landscape, focusing on key trends including the following:

- Preparing for Policy and Regulation Changes
- Decarbonization
- Homeowner and Business Financing
- Social Media, Digital Marketing and A.I.

"To witness a diverse group come together to share insights, forge connections, and drive positive change in our industry was truly inspiring," said Makenzi Roberts, content and communications marketing manager, Rheem. "At Rheem, we are focused on continuing to be a strong partner to our customers and colleagues in the HVACR industry and hosting this amazing event was a great way for us to support the growth of the

dynamic women in this field. We look forward to hosting impactful future sessions."

This event was created in partnership with Women in HVACR, which exists to improve the lives of its members by providing professional avenues to connect with other women growing their careers in the HVACR industry.

Danfoss Seeking Nominations for EnVisioneer of Year

Baltimore, Md. – Danfoss has announced it is now accepting entries for its 15th annual EnVisioneer of the Year award competition.

Launched in 2010, the competition recognizes North American original equipment manufacturers (OEMs), building owners, municipalities, contractors and end users that have introduced a new product, opened a new facility, or invested in a building or system upgrade in the past 18 months using Danfoss products or solutions to realize significant energy and environmental savings.

Interested participants may enter the competition by submitting a nomination by July 19, 2024. Applications will be reviewed and selected by a panel of third-party judges representing various disciplines.

This year, the company will continue to present awards in multiple categories: Original Equipment Manufacturer, End User, Contractor, Consultant, System Integrator. Danfoss encourages entries from all segments, channels and markets we serve.

For more about the EnVisioneer of the Year award competition,

please visit <https://www.danfoss.com/en-us/about-danfoss/insights-for-tomorrow/envisioneer-of-the-year/>.

DOE Green Lights ASHRAE Updated Energy Standard

Atlanta, Ga. – ASHRAE has received a determination from the U.S. Department of Energy (DOE) that ANSI/ASHRAE/IES Standard 90.1-2022, Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings, will increase energy efficiency in commercial buildings subject to the code.

"With the intensified demand for decreased energy consumption and carbon reductions in existing buildings, Standard 90.1 continues to offer essential guidance in shaping building regulations and amplified energy legislation," said ASHRAE president Ginger Scoggins. "The DOE's latest determination further solidifies Standard 90.1 as the cornerstone for achieving energy efficiency goals and ultimately moves us closer towards widescale, global building decarbonization of the built environment."

Here are the DOE's estimates of savings in commercial buildings with the application of Standard 90.1-2022: 9.8% site energy savings, 9.4% source energy savings, and 9.3% carbon emissions savings.

Standard 90.1-2022 marks the first time onsite generation of renewable energy systems has been incorporated as a prescriptive requirement of the standard, recognizing the role of renewables in new construction, echoing similar requirements in several state and local building codes, and better positioning new commercial buildings to achieve net-zero energy. Other key changes include customizable energy credits, a new mechanical system efficiency performance option, requirements to address thermal bridging, expanded criteria for whole-building air-leakage testing, updated lighting power allowances, and additional guidance for using emissions in addition to traditional site-, source-, and cost-based metrics.

Each state is required to certify, within two years of DOE's affirmative determination, that the provisions of its commercial building code regarding energy efficiency have been reviewed and, as necessary, updated to meet or exceed the updated edition of Standard 90.1.

Jobber Grants Now Accepting Applications

Toronto, Canada and U.S. – Jobber, a provider of operations management software for home service businesses, is accepting applications for Jobber Grants, an annual program that recognizes excellence in home service across the U.S. and Canada.

Fifteen businesses will each be awarded a grant of \$10,000. Anyone in home services, from aspiring business owners to experienced owners, is invited to apply at jobber.com/grants.

While grants in the previous four years ranged in size, this year's amount will allow recipients to achieve bigger goals and make a more meaningful impact in their communities, a press release from Jobber said. The application is designed to be easily completed by busy entrepreneurs in any home service industry.

"Jobber is an entrepreneurship enablement company and Jobber Grants is one way we help hard-working service pros jump-start or grow their existing businesses," said Sam Pillar, CEO and the co-founder of Jobber. "Entrepreneurship and small businesses are critical to maintaining healthy communities and strong economies. I'm so inspired by the stories of the 85 business owners who have received Jobber grants so far, and look forward to seeing how the next 15 make a difference in their communities and pursue their entrepreneurial dreams."

After earning a Jobber grant in 2023, Patrick Cotroneo, owner of Qualified Cleaning Service in Florida, grew his company's client base by 20% and sales by an estimated 8% in six months, all while continuing to give back to his community, Jobber's press release said.

"We are very grateful to Jobber for entrusting us with a grant," said Cotroneo. "In addition to directly impacting our business, we were able to provide eight more free cleanings to cancer patients in 2023 than we did in 2022, and we're on pace to do even more this year."

Jobber Grants is organized into categories that reflect different types of home services. The categories include:

- Home Service Heroes: Business owners who keep our homes and offices safe and running smoothly.
- Career Builders: Business owners who help hard-working people build meaningful careers.
- Smooth Operators: Business

owners who prioritize technology and innovation to run a smooth business.

• Community Caretakers: Business owners who give back to the communities where they live and work.

Recipients can choose how to use the grant to support their ambitious business goals and innovative ideas. Whether a company is looking to purchase new equipment, launch a new service, train its teams, or spend marketing dollars, funds from the Jobber Grants program are designed to help small business owners be more successful.

To date, Jobber Grants has awarded \$475,000 to 85 home services entrepreneurs to help them accelerate their plans.

Applications are being accepted through Wednesday, June 12. Finalists will be announced in August 2024. To learn more about Jobber Grants or to apply, visit jobber.com/grants.

Johnstone Supply Selects Quadient as Preferred Partner

Milford, Conn. – Quadient (Euronext Paris: QDT), a leader in helping businesses create meaningful customer connections through digital and physical channels and a major global parcel locker operator, announces that Johnstone Supply has chosen Quadient as its preferred partner for automated parcel lockers. Johnstone Supply, a wholesale distributor serving professional heating, ventilation, air conditioning and refrigeration (HVACR) contractors, has already installed Parcel Pending by Quadient smart lockers at 30 of its locations.

Johnstone Supply has over \$4.5 billion in annual sales generated by 465 franchise-operated locations across the US and Canada. Quadient's indoor and outdoor parcel lockers allow Johnstone Supply's customers to quickly retrieve products at their convenience, allowing them to spend more time at job sites.

"Quadient understands the Johnstone business model, customer needs, brand guideline requirements and integrates with our existing solutions, like our enterprise resource planning platform," said Katie Gailey, marketing manager, Johnstone Supply. "We believe they will be a great partner for our organization and are eager to help Johnstone grow customers' knowledge and use of lockers."

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7 SEER 1987 to 1991	12 SEER 2009 to 2014
8 SEER 1988 to 1999	

*Based upon National Renewable Energy Laboratory booklet Building America Performance Analysis Procedures for Existing Homes (BAPA) booklet

FIGURE 1

Continued from Page 1

2. The cooling degree days per year is also easy, we can look it up on the internet by going to cal.adapt.org/tools/degree-days/1 and putting in your zip code. There is a section on this calculator to enter your location and then you will see the first set of numbers are the 30-year average (1961-1990), for my zip code of 95351 it is 1318 DD.

3. Approximate SEER of the old equipment is also easy if we know when the equipment was manufactured, and we factor in the age of the equipment based on some assumptions about the system degradation over time. Here is the formula from the Department of Housing and Community Affairs for the State of Texas² on the best practices and SEER rating on older equipment. For example, if you are assessing a 16-year-old HVAC system that had an original SEER of 10 you would calculate: $SEER = (10) * (1 - .01) * 16 = (10) * (.99) * 16 = (10) * (.851458) = 8.5146$ is the current SEER of existing unit. To make it simple I use this chart (Figure 1) to plug in the approximate SEER of the old equipment.

4. Your kilowatt rate for the utility is also easily searchable. Here are some of the current rates depending on your utility. PG&E \$0.462/kWh, SCE \$0.367/kWh, SDGE \$0.424/kWh, SMUD \$0.146/kWh, Modesto Irrigation District \$0.1914/kWh, Turlock Irrigation District \$0.1693/kWh, Merced Irrigation District \$0.2085/kWh, Lodi Electric \$0.2154/kWh. These are just a few of the utility companies in California. A quick search for the utility in an area only takes a few seconds.

Once we have assembled all the data, we can then calculate the cost to run the old system and then compare that to the calculated cost to run the new system. We subtract the

it is in MID territory, and I am pricing out a 18 SEER system for \$20,000. Here are the calculations in Figure 2.

There is one more thing that needs to be considered, equipment size. In the example above the unit is a 5-ton. However, in many cases after I have done the load calculation for the home, we discover the system is oversized. In the above example if the unit could size down to a 4-ton, the savings would be even greater, approximately \$3,360 more. In addition, we have not added in any utility rebates or federal tax credits the customer will receive. Federal tax credits alone are \$2,000 and at the time of writing this there is a \$1,000 TECH rebate plus a rebate

Size in BTU's/h X Cooling Degree Days Per Season ÷ SEER X Rate/Kilowatt ÷ 1,000 = Cost per Season

Old system $60,000 \times 1318 \div 8 \times \$0.1914 \div 1,000 = \$1,891$
 New system $60,000 \times 1318 \div 18 \times \$0.1914 \div 1,000 = \$841$
 Savings per season $\$1,050 \times 15 \text{ years} = \$15,750$ (15 years is the expected useful life for an air conditioner)
 Savings per season $\$1,050 \times 20 \text{ years} = \$21,000$ (most systems will last 20 years)

FIGURE 2

of \$750 from MID for \$3,750 additional savings. If you add all the incentives and the savings together and the new system lasts 20 years, the customer could potentially pocket over \$8,000. In other words, the customer's system will more than pay for itself, the customer will pocket \$8,000 more than the

\$20,000 they paid for the system, in fact the new system paid for itself plus \$8,000!

You do need to preface these numbers with a few warnings, you do need to let the customer know that this is typical

Continued on Page 16

Boost Your Bottom Line

With LADWP Water Conservation Rebates

Enjoy the benefits of reduced water bills and operational costs with cash-back rebates, while contributing to a more sustainable future!

	Water Conservation Measure	Rebate Amount	Annual Gallons Saved*	Annual Water & Sewer Bill Savings*
	High-Efficiency Tank Toilet or Flushometer Valve / Bowl Combo Toilet	\$300	3,421	\$55
	Zero and Ultra Low Water Urinal	\$500	39,982	\$641
	Turf Replacement (pre-approval required)	\$5/sq. ft.	44 gallons/sq. ft.	\$705/1,000 sq. ft. change
	Rotating Sprinkler Nozzle (minimum 30)	Up to \$6 per nozzle	1,434	\$23
	Showerheads	FREE	5,370	\$86
	Faucet Aerators	FREE	1,560	\$24

*Approximate values. Actual savings may vary.

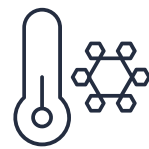


Find more water-saving rebates customized for your business at ladwp.com/SavingWater



Welcome to Hybrid HVAC: intelli-HEAT™

Mitsubishi Electric's intelli-HEAT Dual Fuel System consists of 2 units: an exterior heat pump, which replaces your existing air conditioning condenser, and an interior unit that is installed on your existing furnace*. This smart system not only improves air conditioning efficiency on hot days, but also determines the best source of heat (gas or electricity) on cold days, so your HVAC system is always running at peak efficiency and comfort.



Cold Climate heat pump with furnace integration



Superior efficiency AC replacement solution



Intelligent comfort control manages operation between heat pump and furnace



Reduces fossil fuel consumption and emissions to align with greenhouse gas reduction goals



Compatible with single or multi-zone systems which provides a true zoning solution



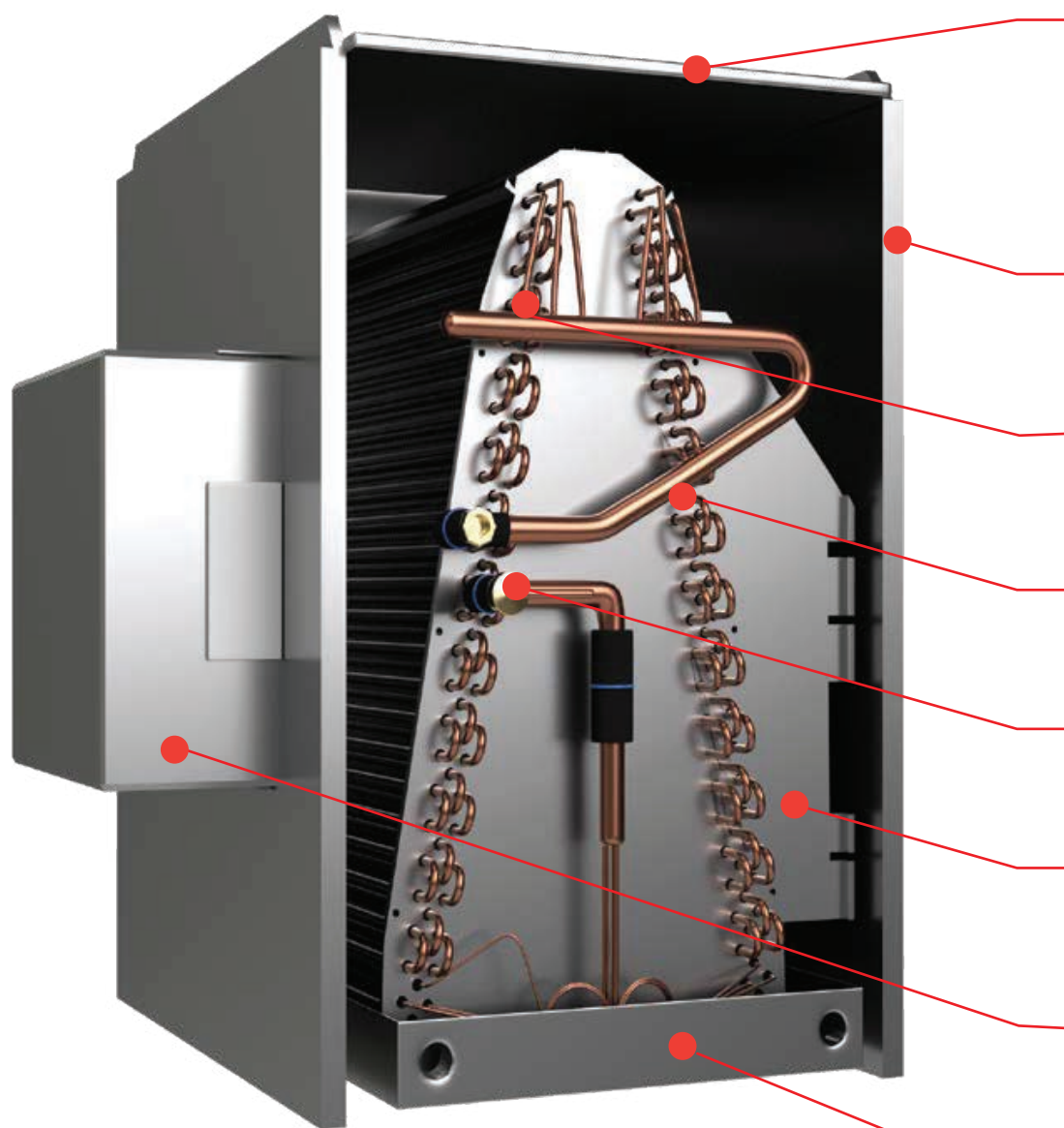
Blending of technologies for comfort, cost effectiveness and environmental benefit

Scan this QR code for more information on intelli-HEAT



intelli-HEAT

Key Benefits and Features



Available in multiple sizes and capacities:

- 18, 24, 30 kBtu/h | 14.5", 17.5" wide | 26.4" height
- 36, 42 kBtu/h | 17.5", 21" wide | 31" height

Single-zone: PUY, PUZ, and PUZ H2i

Multi-zone: MXZ, MXZ H2i, MXZ-SM, and MXZ-SM H2i

Flexible Installation:

- Vertical, downflow and horizontal left/right
- Control box can be mounted anywhere

Oxygen-free copper coils provide up to six times the longevity of standard copper coils

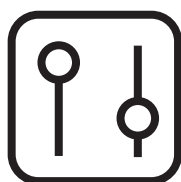
Smaller tube diameters with grooved design technology provide a higher heat transfer efficiency

Flare piping connections for quick, clean, and simple installations with no need for brazing

Best in industry condensation management

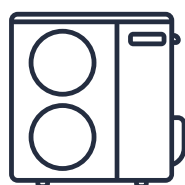
Intelligent comfort control system automatically switches between heat pump and furnace operation to ensure comfort and maintain efficiency

High quality drain pan material with low moisture absorption and high heat capability



Optimum Switchover Control

Economic and capacity balance points ensure homeowner comfort by automatically switching between heat pump and furnace operations as needed.



Single and Multi-Zone Options

New and unique whole-home solution when combined with single or multi-zone heat pumps.



Hyper-Heating Options

intelli-HEAT™ is the only dual fuel system available capable of maintaining 100% of heat pump heating capacity down to 5°F with hyper-heating heat pumps.

Indoor Air Quality, Zoning, & Air Distribution Products

Aircuity Cleanroom Application



Aircuity (www.aircuity.com), a global leader in creating healthy and sustainable buildings, announced the launch of its cleanroom application that delivers adaptive airflow for cleanrooms allowing for carbon reduction, energy savings and precisely controlled IAQ.

Aircuity's cleanroom application delivers precise multi-parameter IAQ measurement to enable adaptive airflow in cleanrooms of ISO 7 and 8. The platform dynamically adjusts air change rates based on continuously monitored particle levels. Airflow is optimized when particle levels are low and increased as levels rise to ensure compliance with ISO standards.

Cleanrooms are the most energy intensive spaces per square foot in the built environment. Aircuity's adaptive airflow provides a better data driven approach to maintaining stringent requirements while allowing clients to address these impactful areas in their pursuit of net zero and energy independence. The company has successfully implemented their platform in other critical environments such as labs and vivaria for over 20 years proving its ability to effectively measure and maintain cleanliness requirements while also providing insightful data, if or when systems mechanical and filtration systems aren't working as intended.

The implementation of adaptive airflow in cleanrooms as either a retrofit or new construction will result in one of the most impactful energy and carbon conservation measures available.

More information:
www.aircuity.com.



Berner International Architectural Icon

Berner International, New Castle, Pa., a leading manufacturer and innovator of air curtains, introduces the Architectural Icon 8 and Icon 10 to its Architectural Collection of air curtains. The two models make this collection the HVAC industry's quietest high performance air curtains for protecting open doorways in hotels, retail, restaurants, healthcare and other market applications where thermal comfort, aesthetics, and energy savings are valued.

The Architectural Icon 8 and Icon 10 models, are redesigns of Berner's renowned Architectural Low Profile 8 and Architectural High Performance 10 air curtains. In addition to quieter operation, the Icons' redesign includes architectural quality aesthetical upgrades and AMCA-certified performance, while maintaining a similar price as their predecessors. The redesign utilizes the industry-leading, aerodynamic platform developed for Berner's Architectural Contour air curtains.

The Icon 8 (1/5-hp) and Icon 10 (1/2-hp) PSC motors combine with other air movement components and a refreshed cabinet design to deliver the lowest operating sound and harmonic dB of any 10-speed air curtain on the market. The performance-to-noise ratio leads the air curtain industry when operating at AMCA 220-certified performance specifications that engineers depend upon for complete door protection. EC motors (1/5 and 1/2-hp) are optional and equally quiet.

The Architectural Icon 8 (8-1/4 (h) x 20 (d)-inches) and Icon 10 (12-3/4 (h) x 25-1/2 (d)-inches) air curtains are available from 3 to 10-feet and 3 to 12-feet lengths, respectively. Standard cabinet is clear satin anodized aluminum that complements today's aluminum/glass commercial entrance and metal architecture trends. Stainless steel and powder coats in dozens of colors are options.

The Icon's refreshed aesthetics offer an elegant new take on Berner's classic streamlined architectural D-shape air curtains. The redesigned intake screen has been repositioned to reduce sight lines into interior components augmenting the versatile, low-key nature of this design. As with other air curtains introduced by Berner in the past three years, the Intelliswitch™ digital controller is treated as a design element and built-into a strip articulated alongside the air stream outlet. Taking a cue from furniture design, Berner's minimalist mounting hardware has been simplified even further, allowing for a tighter fit to the wall with less effort.

The air curtain is programmed



and operated through Berner's industry-leading, factory-installed Intelliswitch digital control platform. The Intelliswitch features pre-set programs, a time clock, time delay, built-in thermostat, 10-speed fan control, and other integrated, end-user customizable features. The optional Berner AIR™ smart controller and app can be added to the platform, allowing operation and monitoring from a smartphone, tablet or personal computer. The Berner AIR includes true BACnet integration and a proactive adaptive setting based on the weather.

More information:
www.Berner.com.



Decon7 Systems



The need to improve indoor air continues to challenge the HVAC industry as viruses, allergens and other harmful microorganisms circulate and impact the health of homeowners and building occupants. Now wholesalers and contractors can augment their indoor air quality (IAQ) offerings with a powerful and versatile solution from **Decon7 Systems:** a disinfectant for HVAC system components that is proven to kill harmful pathogens that thrive in these systems and can cause health issues.

Decon7's recent entrance into the HVAC market offers contractors a new revenue stream with products that are affordable and can be easily applied during a service call.

Unlike products on the market that only sanitize, D7 is an EPA-registered disinfectant, deodorizer, sanitizer and powerful cleaner with a kill rate of up to 99.9999%. This provides contractors with one of the most powerful solutions available to kill pathogens that collect in evaporator coils and on fan blades; it can also be fogged into ductwork for deodorization (not in CA) and foamed into drains as a deodorizer.

Decon7 Systems is a long-time developer and producer of D7, a proven disinfectant used in multiple industries to kill the toughest pathogens, including norovi-

rus, SARS-Co-V2 (the virus that causes COVID-19), and bacteria such as Staph and Legionella.

Additionally, D7 has been verified as effective in eliminating several types of molds including *Aspergillus Niger* (black mold).

D7 is composed of mild ingredients with a pH close to neutral, making it safe on a wide range of surfaces in residential and commercial properties.

"Consumers are increasingly demanding superior indoor air solutions, and D7 emerges as a powerful addition to the array of IAQ products that can fulfill that need," said Matt Bluhm, Chief Executive Officer of Decon7 Systems. "We aim to collaborate with wholesale partners committed to expanding their IAQ product lines. By providing access to D7, we can support their business growth while also enabling them to deliver an innovative product that meaningfully enhances well-being through better indoor air."

More information:
www.Decon7.com.



Fellowes Array



Fellowes introduces the revolutionary Array networked air quality system, continuing its century-long tradition of delivering innovative home, workplace, and smart technology to fulfill WorkLife needs. Array is the first system of its kind, where networked air purifiers work alongside commercial HVAC systems to improve indoor air quality faster and more efficiently than ever before.

Array is a breakthrough solution that uses proprietary technology to combine the benefits of H13 True HEPA filtration, a full suite of indoor air quality sensors and monitoring with real-time data to monitor, track, and improve building-wide air.

While most HVAC systems aim to meet the MERV 13 standard of filtration, Array filters are twice as effective without compromising efficiency. The Fellowes Array system is able to leverage H13 True HEPA filtration to achieve this filtration level while still delivering highly efficient air flows at a quiet rate.

The patented EnviroSmart+ Technology continuously monitors the environment for changes in occupancy density and conditions of the space and automatically adjusts units to ramp up or down to address changes in contaminants.

Array is also powerful enough to deliver an additional 3 to 5 eACH, depending on room size. The innovative design pulls contaminants out of the breathing zone while simultaneously pushing clean air into the room to improve ventilation effectiveness, delivering an increase in equivalent room air changes – reducing the stress on HVAC systems and energy costs.

More information:
www.fellowes.com.



Greenheck XG-TH-500 Series

Greenheck's XG-TH-500 Series Air Terminal Units (ATU) are zone-level air distribution devices that regulate airflow for maximum occupant comfort in variable or constant volume applications. The single-duct XG-TH-500 features a galvanized steel casing mechanically sealed for low leakage construction along with a round inlet damper, an inlet flow sensor, and a rectangular outlet. Cooling only, hot water coil, and electric heat configurations can be specified.

AHRI certified, the XGTH-500 is available in ten sizes with capacities ranging from 80 to 7,270 cfm with a full range of options and accessories including attenuators, liners, heating coils, and access doors. Pneumatic, electric, analog or direct digital controls are also available.

Greenheck's comprehensive air terminal unit line also includes dual duct, fan-powered, and retrofit models. The addition of air distribution products allows Greenheck to be a single-source supplier for complete ventilation systems creating safe, healthy, and comfortable spaces in commercial and institutional building projects.

More information:
www.greenheck.com.



Continued on Page 16

The York® HMM7 Horizontal Discharge Heat Pump:

2-5 Ton • Standard 24 Volt Controls • Works With Conventional Air Handling Units and Evaporator Coils • Price Competitive With Standard Heat Pumps



NEW LOWER PRICE!

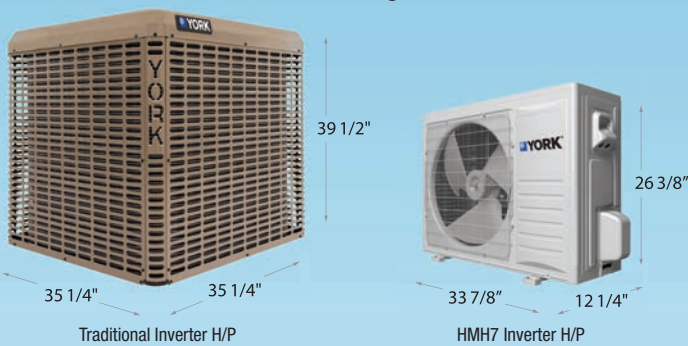
- Up to 18 SEER/10.5 HSPF
- 40% more compact than standard heat pump units and can be installed in tighter spaces – ideal for high-density areas
- 36% quieter operating sound; as low as 54 dBA
- Capable of dual-fuel operation when paired with an existing or new furnace, using a Venstar thermostat
- Can be installed in conjunction with existing furnace for lower installation cost and potentially avoid electrical service upgrade
- Modulating technology maintains exact temperatures by operating from 35-100% capacity
- No unique installation procedures required
- Long line set length (up to 246 ft)
- Designed to work with standard ECM indoor air handlers

Cooling-only units as low as \$1425!

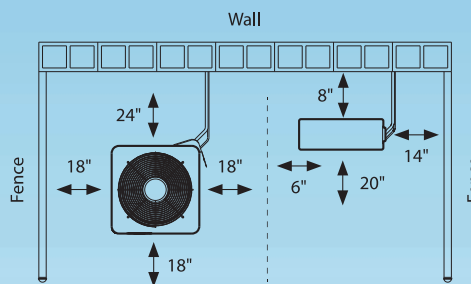
Model	Tons	SEER	HSPF	Height (Inches)	Width (Inches)	Depth (Inches)	Operating Weight (Lbs)	Sound Range (dBA) Low-High*
HMH72B241S	2	17.5	9.0	26 3/8	33 7/8	12 1/4	112	54-65
HMH72B361S	3	18.0	10.5	33	37 3/8	13 3/8	155	56-68
HMH72B481S	4	18.0	9.5	54 5/8	37 3/8	13 3/8	227	62-69
HMH72B601S	5	17.0	10.0	54 5/8	37 3/8	13 3/8	251	62-73

*High sound rated in accordance with AHRI Standard 270.

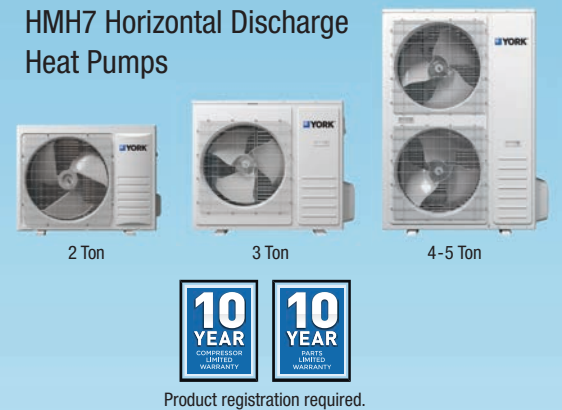
40% smaller footprint compared to traditional vertical discharge units



Traditional, Vertical Unit Minimum Clearances vs. HMM7 Minimum Clearances



HMM7 Horizontal Discharge Heat Pumps



NEW AEF SERIES MODULAR BLOWER

- Easiest way to change from furnace to heat pump
- 120V air handler fits perfectly to replace furnace
- Matching duct connections and dimensions

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Indoor Air Quality, Zoning, & Air Distribution Products

Continued from Page 14

Modine VidaShield UV24



Modine (NYSE: MOD), a technology and indoor air quality leader in the HVAC industry, is now offering the VidaShield™ UV24 Active Air Disinfection System product line to the K-12 school market. This innovative solution will further help equip schools with the necessary tools to combat airborne pathogens.

VidaShield™ UV24 is a fast, continuous air disinfection system that combines an ultraviolet germicidal irradiation (UVGI) chamber and air circulating fans with an optional overhead ceiling light, making it convenient for schools, universities and daycare centers.

“Airborne pathogens are a significant contributor to the spread of illness, which can ultimately lead to missed school days for students,” said Kimberly Raduenz, Manager, Strategic Marketing for the IAQ division at Modine.

“The CDC recommends adding germicidal solutions in high-risk areas to better combat pathogens. VidaShield™ UV24 is a solution that provides ultraviolet germicidal irradiation in the form of UV-C that is safe for occupied spaces while also being easy to install. When combined with increased ventilation and improved filtra-

tion, this product can be the missing component for enhanced indoor air quality inside schools and other educational facilities.”

VidaShield™ UV24 helps improve IAQ by drawing in airborne pathogens and pollutants with an array of fans. Air is then passed through a MERV 6 filter where larger particulates of dust are trapped, but pathogens can pass through into a shielded chamber. A 253.7 nm UV-C bulb in the chamber neutralizes viruses, bacteria and fungi.

VidaShield™ UV24 helps eliminate various pathogens, including SARS-CoV-2 (the virus that causes COVID-19), coronaviruses, and viruses or bacteria that cause the common cold, Influenza A, measles, mumps, Tuberculosis, pneumonia, MRSA and C Diff.

“At Modine, we live by our purpose of engineering a cleaner and healthier world,” Raduenz said. “While we have a vast catalog of products that provide schools with IAQ solutions, we are always looking for ways to evolve that help schools provide safer and cleaner air for students. Offering the VidaShield™ UV24 product is another example of our dedication to students across the U.S.”

More information:
www.modinehvac.com/

Particles Plus Air Quality Monitors

The **Particles Plus** 7301-AQM1 and 7301-AQM2 Series Handheld Particle Counter and Environmental Monitor measures 0.3 to 25 µm particles with mass concentration and stores indoor air quality mea-



surements of temperature, relative humidity, CO₂, and TVOC in the 7301-AQM2. This instrument is the most versatile handheld Air Monitor available, with advanced power management and the industry’s first sleep mode, allowing for battery operation of periods that can exceed a month on a single charge. The AQM Series can be used as a stand-alone battery operated instrument or it can be easily integrated into a building automation and facility monitoring system via Ethernet, USB or (optional) Wireless 802.11 b/g, RS485 or RS232 connection.

More information:
www.particlesplus.com

Sentry Air Systems UV Air Purifier



The Germ Killer UV Air Purifier from **Sentry Air Systems** may help reduce disease transmission through a powerful airflow and 2 high-intensity UV lamps.

The UV lamps emit UV-C wavelengths to aid in deactivating the DNA/RNA of viruses, bacteria, and fungi to help reduce the reproduction and spread of

microorganisms. This innovative patent-pending design features adjustable airflow, pre-filters to capture most large particles, and a UV light sensor to check for a sufficient UV-C dose. Also, this system has numerous design features to reduce UV light leaks and improve efficacy.

The Germ Killer provides a safer and more effective solution for heavily-populated areas such as schools, doctors’ offices, workplaces, hospitals, and more.

More information:
www.sentryair.com

Steril-Aire ISO 9001 Certification



Steril-Aire, a leader in germicidal UVC HVAC solutions, has achieved ISO 9001 certification for Quality Management Systems and ISO 14001 certification for Environmental Management Systems. The manufacturer has held the respected organizational excellence accreditations since 2005 and 2016 respectively.

ISO 9001 and ISO 14001 are international standards that provide a framework for implementing quality and environmental management systems. Companies gain certification by implementing policies, procedures and systems that follow and meet ISO standards, which are assessed by a third-party certification body. These standards guide businesses in ensuring the consistent delivery of

quality products and services while managing their environmental impact responsibly.

Since pioneering UVC for HVAC™ technology in 1994, the company has grown to become the dominant innovator of high-performance germicidal UVC technologies for air and surface decontamination. Today, Steril-Aire continues to prioritize quality assurance and customer service.

More information:
www.steril-aire.com

Aspen Air Handler

The **Aspen Air Handler** offers application versatility: Upflow or horizontal right as shipped (field convertible for downflow or horizontal left applications). Can be AHRI certified with most brands of air conditioners or heat pumps. ETL-listed for use with all major refrigerants when proper metering device is used.

Low Leakage Cabinet: Less than 2% air leakage from cabinet when tested in accordance with ASHRAE standard 193. Unit must be installed according to installation instructions. Sturdy, fully insulated galvanized steel cabinet with knockout for duct return.

Air Moving System: Constant torque ECM speeds and torques

Continued on Page 18



Mitch Bailey has been in the HVAC business for over 48 years and added Instructing for IHACI 9 years ago. Most recently, he has also become a part-time adjunct instructor for National Comfort Institute. His approach to Heating and Air emphasizes proper design, installation and commissioning. At his HVAC company they perform a load calculation on every system that includes a pretest and posttest after each system he replaces. Mitch and his company live by the motto, “We only have one shot to do it right, and that requires testing and proper design that includes knowing how the old system performed.”

Calculating SEER

Continued from Page 11

usage with average temperatures. If it is a cooler year, the savings are less, if the customer does not run the system like a typical homeowner, the savings are less, but the opposite holds true if the weather is warmer than an average year, and the customer likes their home cooler, then they will save even more.

It is obvious that new equipment will save the customer money. What will give you an edge is knowing the numbers

and coming up with an amount that the customer could potentially save. So, take the time and get the data for your area, create a form or spreadsheet to show the savings to your customer. If you would like, you can email me for a copy of the savings sheet that I use and then modify it for your company to calculate how much the customer can save.

1. <https://cal-adapt.org/tools/degree-days/>

2. <https://www.tdhca.state.tx.us/community-affairs/wap/docs/WAP-BP-SEERandEERDe-termination.pdf>



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The Quality Residential HVAC Services Program is funded by California utility customers under the auspices of the California Public Utilities Commission and implemented by Frontier Energy under a contract awarded by San Diego Gas & Electric Company (SDG&E®). Customers who choose to participate in this program are not obligated to purchase any additional services offered by the Implementer. The trademarks used herein are the property of their respective owners.

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Services	Tier I	Tier II
Quality Bid	\$350	\$700
Quality Installation	\$500	\$1000
Quality Maintenance	\$350	\$700
Quality Maintenance Call	\$150	\$300

A Split System Heat Pump That's Not Performing

By Jim Johnson
Contributing Editor

In this month's troubleshooting situation, we have an elderly customer in immediate need of assistance. When they called to request emergency service, their description of the problem was that their "air conditioner was not keeping the house comfortable at all". When you arrive, you determine that the equipment is a split system heat pump, and that the while the thermostat is properly set and the indoor air handling system is operating, you determine that the discharge air temperature is not correct.

With your initial indoor evaluation of the situation accomplished,

you check the outdoor section of the unit (see the partial wiring diagram in **Figure 1**) and find the following:

-240 VAC at L1 and L2
-24 VAC at the contactor coil
-240 VAC at T1 and T2

You also find the following conditions:

-Compressor hot and off on internal overload
-Outdoor Fan Motor sitting dead

As your next step, you disconnect the power supply and the appropriate wiring connections to facilitate an ohmmeter test on terminals DF1 and DF2 of the Defrost Control, which shows infinity.

Your troubleshooting question: *What is your next step in servicing this equipment?*

If you believe you have the correct answer to one of Jim Johnson's Troubleshooting Problems, please submit it by email to Jim Johnson at icntroubleshooting@techtrainassoc.com or by U.S. Mail to: Technical Training Associates, PO Box 2259, Green Valley, AZ 85622-2259.

In your email subject line please include "Troubleshooting Answer" and indicate which month the question you are responding to was published.

Correct answers will be entered into a drawing and will be eligible to receive a copy of Jim Johnson's video "Evaluating Refrigeration Systems: Troubleshooting & Identifying Problems."

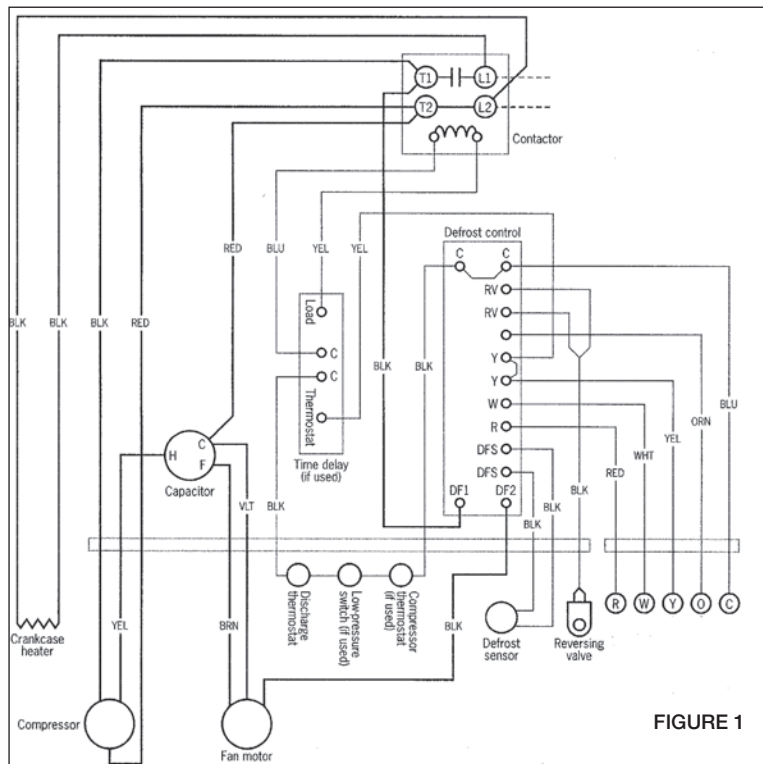


FIGURE 1



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Answer to Last Month's Troubleshooting

The diagnosis of an inefficient compressor was incorrect. The problem is a leaking check valve.

The winner of last month's Troubleshooting is:
David Erickson

Editorial Focus

Continued from Page 16

are controlled by software embedded in the motor to maintain constant torque. Motors are pre-programmed with speeds and torques at the factory for optimal performance and reliability. Direct drive blowers circulate air quietly and efficiently. Rail-mounted blowers provide easy removal for service and maintenance.

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MARCH / APRIL

AC/HP Refrigeration Module

(Four-Night Class) Instructor: John Dalton

- Mon., March 11 – Part 1
- Tues., March 12 – Part 2
- Mon., April 1 – Part 3
- Tues., April 2 – Part 4

MAY

Air Distribution Module

(Four-Night Class) Instructors: Mike Griffin / John Dalton

- Wed., May 22 – Part 1
- Thurs., May 23 – Part 2
- Wed., May 29 – Part 3
- Thurs., May 30 – Part 4

JUNE

System Diagnostics Module (Webinar)

(Four-Night Class) Instructors: Mike Griffin / John Dalton

- Mon., June 3 – Part 1
- Tues., June 4 – Part 2
- Mon., June 10 – Part 3
- Tues., June 11 – Part 4

JULY / AUGUST

System Performance Module

(Four-Night Class) Instructors: Mike Griffin / John Dalton

- Wed., July 10 – Part 1
- Thurs., July 11 – Part 2
- Wed., Aug. 7 – Part 3
- Thurs., Aug. 8 – Part 4

SEPTEMBER

NATE CORE & Gas Heating Training (Webinar)

(Four-Night Class) Instructors: Mike Griffin / John Dalton

- Mon., Sept. 16 – Part 1
- Tues., Sept. 17 – Part 2
- Mon., Sept. 23 – Part 3
- Tues., Sept. 24 – Part 4

OCTOBER

NATE AC/HP Refrigeration & Air Distribution Training (Webinar)

(Four-Night Class) Instructors: Mike Griffin / John Dalton

- Mon., Oct. 21 – Part 1
- Tues., Oct. 22 – Part 2
- Mon., Oct. 28 – Part 3
- Tues., Oct. 29 – Part 4

Sat., Nov. 2 - NATE Exam, 7:30 a.m. In-Person/Onsite

SOUTHERN CALIFORNIA EDISON, IRVINDALE

APRIL

AC/HP Refrigeration Module

(Four-Night Class) Instructor: John Dalton

- Wed., April 10 – Part 1
- Thurs., April 11 – Part 2
- Wed., April 17 – Part 3
- Thurs., April 18 – Part 4

MAY

NATE CORE & Gas Heating Training

(Four-Night Class) Instructor: Mike Griffin

- Wed., May 8 – Part 1
- Thurs., May 9 – Part 2
- Wed., May 15 – Part 3
- Thurs., May 16 – Part 4

JUNE

NATE AC/HP Refrigeration & Air Distribution Training

(Four-Night Class) Instructor: Mike Griffin

- Wed., June 5 – Part 1
- Thurs., June 6 – Part 2
- Wed., June 12 – Part 3
- Thurs., June 13 – Part 4

Sat., June 15 - NATE Exam, 7:30 a.m.

SEPTEMBER

System Diagnostics Module

(Four-Night Class) Instructor: John Dalton

- Wed., Sept. 11 – Part 1
- Thurs., Sept. 12 – Part 2
- Wed., Sept. 18 – Part 3
- Thurs., Sept. 19 – Part 4

OCTOBER

Commercial Chillers Module

(Two-Night Class) Instructor: John Dalton

- Wed., Oct. 2 – Part 1
- Thurs., Oct. 3 – Part 2

Commercial Cooling Towers Module

(Two-Night Class) Instructor: John Dalton

- Wed., Oct. 9 – Part 1
- Thurs., Oct. 10 – Part 2

NOVEMBER

System Performance Module

(Four-Night Class) Instructors: Mike Griffin / John Dalton

- Wed., Nov. 6 – Part 1
- Thurs., Nov. 7 – Part 2
- Tues., Nov. 12 – Part 3
- Thurs., Nov. 14 – Part 4

Note: When registering for a training class please make sure you honor that commitment and show up on time and prepared. If you cannot attend, please call (818) 551-1555 and cancel in ample time. Thank you.

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**SOUTHERN CALIFORNIA EDISON,
TULARE**

APRIL

Air Distribution Module

(Four-Night Class) Instructors: Mike Griffin/ Mitch Bailey

Wed., April 10 – Part 1

Thurs., April 11 – Part 2

Wed., April 17 – Part 3

Thurs., April 18 – Part 4

MAY

System Performance Module

(Four-Night Class) Instructors: Mitch Bailey / Bob Gunn

Wed., May 8 – Part 1

Thurs., May 9 – Part 2

Wed., May 15 – Part 3

Thurs., May 16 – Part 4

JUNE

AC/HP Refrigeration Module

(Four-Night Class) Instructor: Mitch Bailey

Tues., June 18 – Part 1

Wed., June 19 – Part 2

Tues., June 25 – Part 3

Wed., June 26 – Part 4

SEPTEMBER

System Diagnostics Module

(Four-Night Class) Instructor: Mitch Bailey

Wed., Sept. 18 – Part 1

Thurs., Sept. 19 – Part 2

Wed., Sept. 25 – Part 3

Thurs., Sept. 26 – Part 4

OCTOBER

NATE CORE & Gas Heating Training

(Four-Night Class) Instructor: Mitch Bailey

Wed., Oct. 9 – Part 1

Thurs., Oct. 10 – Part 2

Wed., Oct. 16 – Part 3

Thurs., Oct. 17 – Part 4

OCTOBER / NOVEMBER

NATE AC/HP Refrigeration & Air Distribution Training

(Four-Night Class) Instructor: Mitch Bailey

Tues., Oct. 29 – Part 1

Wed., Oct. 30 – Part 2

Wed., Nov. 6 – Part 3

Thurs., Nov. 7 – Part 4

Sat., Nov. 9 - NATE Exam, 7:30 a.m.

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(Four-Night Class) Instructor: Mitch Bailey

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Thurs., Mar. 28 – Part 2

Wed., April 3 – Part 3

Thurs., April 4 – Part 4

APRIL / MAY

System Performance Module (In-Person/Simulcast)

(Four-Night Class) Instructor: Mitch Bailey

Wed., April 24 – Part 1

Thurs., April 25 – Part 2

Wed., May 1 – Part 3

Thurs., May 2 – Part 4

MAY

AC/HP Refrigeration Module (Webinar)

(Four-Night Class) Instructor: Mitch Bailey

Wed., May 22 – Part 1

Thurs., May 23 – Part 2

Wed., May 29 – Part 3

Thurs., May 30 – Part 4

SEPTEMBER

System Diagnostics Module (Webinar)

(Four-Night Class) Instructor: Mitch Bailey

Wed., Sept. 4 – Part 1

Thurs., Sept. 5 – Part 2

Wed., Sept. 11 – Part 3

Thurs., Sept. 12 – Part 4



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Technical Training

Growing Green Technicians Part 174: Checking a New Split System Installation Air Flow with a Temperature Split Test

By Jim Johnson
Contributing Editor

In the last segment of this series, our discussion centered on the topic of ESP (External Static Pressure) and using a manufacturer specific chart to evaluate system performance. In this issue, we'll discuss using a generic chart to evaluate a new installation of split system comfort cooling equipment. Everyone can agree that when equipment is installed, it's a given that upon start-up, the refrigeration system's operation needs to be evaluated via superheat and subcooling test procedures.

After all, taking a green approach to completing the installation means that we need to take into consideration the charge in the outdoor unit, along with the variable of the length of line set, and the quantity (if any) of refrigerant that needs to be added to ensure the proper operating pressures that will result in the efficient

operation of the equipment.

So, the focus is on isolating the refrigeration system and checking pressures, converting them to temperature, checking tubing temperatures, and matching things up to determine if the superheat and subcooling are correct according to the charts provided by the manufacturer. However, there's also a simple air flow system performance test that can be accomplished simultaneously with performing a refrigeration system evaluation. In the same vein in which everyone can agree about the necessity of performing superheat and subcooling procedures, we can also agree that without the proper air flow through the indoor coil, the refrigeration system cannot perform properly.

Taking this simple step involves a target temperature split chart like the one shown in **Figure 1**.

This chart is similar to generic target superheat charts, but the targets are not superheat values,

		Return Air Wet-Bulb (°F) (T _{return, wb})																											
		50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	
Return Air Dry-Bulb (°F) (T _{return, db})	70	20.9	20.7	20.6	20.4	20.1	19.9	19.5	19.1	18.7	18.2	17.7	17.2	16.5	15.9	15.2	14.4	13.7	12.8	11.9	11.0	10.0	9.0	7.9	6.8	5.7	4.5	3.2	
	71	21.4	21.3	21.1	20.9	20.7	20.4	20.1	19.7	19.3	18.8	18.3	17.7	17.1	16.4	15.7	15.0	14.2	13.4	12.5	11.5	10.6	9.5	8.5	7.4	6.2	5.0	3.8	
	72	21.9	21.8	21.7	21.5	21.2	20.9	20.6	20.2	19.8	19.3	18.8	18.2	17.6	17.0	16.3	15.5	14.7	13.9	13.0	12.1	11.1	10.1	9.0	7.9	6.8	5.6	4.3	
	73	22.5	22.4	22.2	22.0	21.8	21.5	21.2	20.8	20.3	19.9	19.4	18.8	18.2	17.5	16.8	16.1	15.3	14.4	13.6	12.6	11.7	10.6	9.6	8.5	7.3	6.1	4.8	
	74	23.0	22.9	22.8	22.6	22.3	22.0	21.7	21.3	20.9	20.4	19.9	19.3	18.7	18.1	17.4	16.6	15.8	15.0	14.1	13.2	12.2	11.2	10.1	9.0	7.8	6.6	5.4	
	75	23.6	23.5	23.3	23.1	22.9	22.6	22.2	21.9	21.4	21.0	20.4	19.9	19.3	18.6	17.9	17.2	16.4	15.5	14.7	13.7	12.7	11.7	10.7	9.5	8.4	7.2	5.9	
	76	24.1	24.0	23.9	23.7	23.4	23.1	22.8	22.4	22.0	21.5	21.0	20.4	19.8	19.2	18.5	17.7	16.9	16.1	15.2	14.3	13.3	12.3	11.2	10.1	8.9	7.7	6.5	
	77	-	24.6	24.4	24.2	24.0	23.7	23.3	22.9	22.5	22.0	21.5	21.0	20.4	19.7	19.0	18.3	17.5	16.6	15.7	14.8	13.8	12.8	11.7	10.6	9.5	8.3	7.0	
	78	-	-	-	24.7	24.5	24.2	23.9	23.5	23.1	22.6	22.1	21.5	20.9	20.2	19.5	18.8	18.0	17.2	16.3	15.4	14.4	13.4	12.3	11.2	10.0	8.8	7.6	
	79	-	-	-	-	-	24.8	24.4	24.0	23.6	23.1	22.6	22.1	21.4	20.8	20.1	19.3	18.5	17.7	16.8	15.9	14.9	13.9	12.8	11.7	10.6	9.4	8.1	
	80	-	-	-	-	-	-	25.0	24.6	24.2	23.7	23.2	22.6	22.0	21.3	20.6	19.9	19.1	18.3	17.4	16.4	15.5	14.4	13.4	12.3	11.1	9.9	8.7	
	81	-	-	-	-	-	-	-	25.1	24.7	24.2	23.7	23.1	22.5	21.9	21.2	20.4	19.6	18.8	17.9	17.0	16.0	15.0	13.9	12.8	11.7	10.4	9.2	
	82	-	-	-	-	-	-	-	-	25.2	24.8	24.2	23.7	23.1	22.4	21.7	21.0	20.2	19.3	18.5	17.5	16.6	15.5	14.5	13.4	12.2	11.0	9.7	
	83	-	-	-	-	-	-	-	-	-	25.3	24.8	24.2	23.6	23.0	22.3	21.5	20.7	19.9	19.0	18.1	17.1	16.1	15.0	13.9	12.7	11.5	10.3	
	84	-	-	-	-	-	-	-	-	-	-	25.9	25.3	24.8	24.2	23.5	22.8	22.1	21.3	20.4	19.5	18.6	17.6	16.6	15.6	14.4	13.3	12.1	10.8

FIGURE 1

they are temperature differentials. To use the chart, we need to take four simple steps:

1. Allow the equipment to run for at least 15 minutes.
2. Take a dry bulb reading of the air entering the coil.
3. Take a web bulb reading of the air entering the coil.
4. Calculate the target temperature differential.

For example, consider that we were in a situation where the heat load in the building is high (after all, it's a new start-up), and our dry bulb measurement was 83 degrees, and our web bulb measurement was 67 degrees. What

the chart would tell us is that the target temperature split across the coil would be 19.9 degrees. With this information at hand, we would take a dry bulb reading of the air entering the coil (return), and a dry bulb reading of the air exiting the coil (supply), and then do the arithmetic.

If our temperature drop is within + or - 3 degrees of our target temperature, we've taken a fundamental step in determining that the air flow through the indoor coil is correct. If the temperature drop is more than 3 degrees lower than our target, it indicates that the air flow is inadequate. And, since this is a new installation, it could mean that the solution is

as simple as adjusting the supply registers for a better balance of air flow. Or it could mean that there is a problem with the design of the supply plenum velocity bonnet or static take-off, or there is an issue with the return air system that is restricting air flow.

If the measured temperature drop was more than 3 degrees higher than our target, it would indicate that the air flow is excessive. This situation is far less common than that of inadequate air flow, but it has the same effect of diminishing the ability of the refrigeration system to accomplish its task of transferring heat efficiently.

Indoor People

Indoor People

Continued from Page 1

the field and provide resources for long-term career growth. Additionally, Johnson Controls believes peer-to-peer support plays a powerful role in carving a path for women's success. In honor of International Women's Day held on March 8, Johnson Controls celebrated a few of the incredible women who are inspiring inclusion within the HVAC industry.

Christyn Mueller is passionate about advancing the HVAC workforce. As an associate director of partner enablement at Johnson Controls, she leads a team of facilitators who are responsible for designing and instructing technical and sales training programs. She also oversees a robust internship program, an initiative she spearheaded, that nurtures college students who are interested in a career in HVAC.

Christyn believes mentorship is paramount to career development – especially for women. It's a resource she credits in advancing her own career. Christyn notes, "As

a mother of three, I did not believe I could have a fulfilling career. It was my long-term mentor who showed me that being a mom did not make me less of an employee, but rather it provided me with experiences I could use within my work situations."

Paying this advice forward, Christyn became a member of the Johnson Controls Ducted Systems Mentorship Program Committee and joined both Women in HVACR and the Johnson Controls Women's Global Network. She also leads the North American cohort of the Women in Leadership program. She is passionate about connecting with other like-minded women who are working to make a difference within the industry. Outside of work, Christyn is thoroughly enjoying her current season of parenthood, especially when it leads to a great vacation.

When **Rebecca Robbennolt** was a high school student, STEM programs for girls were scarce. Today, as a global strategic account manager at Johnson Controls, Rebecca uses her professional experience to inspire middle and high school girls to pursue a future



REBECCA ROBBENNOLT

in science and math. Whether she is volunteering with Girls Empowered by Math and Science (GEMS) or her local Girl Scout chapter or is speaking at local high schools, Rebecca believes simply introducing girls to the possibility of STEM careers is a powerful step in breaking gender bias.

Rebecca is often described as curious, engaging and supportive. She uses these qualities in her role serving the world's leading data centers and to build connections with her colleagues and peers. Rebecca is a member of the 7x24 Exchange community, the Women in Leadership Program and Women's Global Network and serves as a mentor for the Alpha



TRACEY MCCOY

Delta Pi chapter of her alma mater, South Dakota School of Mines & Technology.

As a mom of two, Rebecca is equally engaged in her role as a parent. She is active within her children's school, where she serves as the volleyball coordinator and treasurer of the athletic association, coaches three youth volleyball teams and helps manage a youth club soccer team.

Tracey McCoy is a dynamic leader within the Building Solutions North America (BSNA) Applied Equipment leadership team at Johnson Controls, working as an area general manager. She started her career at Johnson Controls 22 years ago leading the Central

United States Service organization. Today, she leads the YORK Agent network throughout the Western United States, extending out to Hawaii & Guam and as far north as Alaska. Along with a team of sales and operations professionals, she provides business leadership and technical guidance throughout a network of 13 Agents in 30+ unique markets.

Moving into her fourth decade, Tracey has witnessed many changes in the representation of women at Johnson Controls and in the HVAC industry as a whole. "Johnson Controls has always been intentional and progressive in their commitment to diversity and inclusion for all employees. I noticed it immediately when I came to work here. While we still have work ahead of us, I'm equally proud of the opportunities and recognition that women specifically have at Johnson Controls."

Tracey lives on a ranch in Montana along with her husband and family of animals, including 2 cats, 3 golden retrievers, horses and a miniature donkey named George Strait. When she's not tending to the animals, she can be found

Indoor People

hiking, biking, skiing, camping, kayaking, riding horses and enjoying all of the outdoor activities that come with living in the mountains.

.....

Tom Bourquin has been promoted to Vice President and General Manager for the HVAC business segment at Nidec Motor Corporation. The U.S. MOTORS® brand products for HVAC systems

include high-efficiency synchronous and variable-speed ECM motors with integrated controls for superior performance and energy savings.

In his new role, Bourquin oversees the engineering, sales, and marketing departments. Additionally, his role involves fostering collaboration within HVAC in the areas of operations, finance, quality, and procurement.

Bourquin has 22 years of experience in motors, holding various roles in engineering and sales. His most recent position at Nidec was V.P. of Engineering for HVAC. Prior to joining



TOM BOURQUIN



MARK LABITAD

Nidec, Bourquin spent five years as a product manager for HVAC component manufacturer Parker Hannifin – Sporlan. He holds a B.S. in Mechanical Engineering from Washington University in St. Louis, and an M.B.A. from Webster University.

“Tom brings to his new role a deep understanding of the engineering side of our business, as well as a wealth of knowledge of the HVAC industry. That combination will serve us and our HVAC customers well as we head into 2024,” said Tim Schamel, President of the U.S. MOTORS division of Nidec.

.....

Airzone Control, provider of intelligent and innovative HVAC control solutions, is pleased to announce the hiring of **Mark Labitad** as the Territory Manager for California. With a robust background in HVAC systems and a proven track record of sales excellence, Labitad brings a wealth

of knowledge and expertise to the Airzone team.

Labitad started his career as an HVAC Technician at Blue Mountain, where he was responsible for commissioning, inspection, and maintenance of HVAC systems. He has used this strong technical foundation to build a successful sales career. At companies including Monarch Home Services, EMCOR (MESA) and Aspen Manufacturing, Labitad’s commitment to client outcomes and superior project management has enabled him to significantly increase annual contract values, develop key client and partner relationships, and expand territory.

As Territory Manager for California, Labitad will be responsible for managing and expanding Airzone’s HVAC dealer relationships in the region. His primary focus will be on developing and executing strategic sales plans, fostering relationships with key stakeholders, and identifying new opportunities for growth.

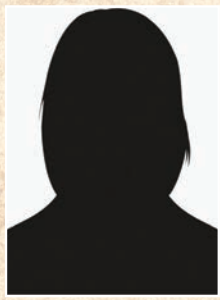
“I am excited to embark on this new journey with Airzone, a company renowned for innovation and in the HVAC industry,” Labitad said.

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