



AHR Expo 2021 Innovation Awards Winners Announced

WESTPORT, Conn., November 5, 2020 – The AHR Expo (International Air-Conditioning, Heating, Refrigerating Exposition) today announced the winners of the 2021 [AHR Expo Innovation Awards](#) in ten industry categories. Show Management, co-sponsors ASHRAE and AHRI, and the Innovation Awards panel of judges wish to acknowledge and honor the 2021 award winners despite the recent cancellation of the live event. Typically, award winners are formally recognized at a ceremony hosted on day two of the annual Show.

“The Innovation Awards are an exciting part of the AHR Expo and we are disappointed that we won’t be able to honor them in the same ways we would at a live Show,” said Show Manager, Mark Stevens. “Despite the challenges 2020 has presented, we are committed to recognizing the incredible innovators in our industry.”

Submissions were collected over the summer and then reviewed by a panel of third-party judges made up of distinguished ASHRAE members. Entrants are evaluated based on overall innovative design, creativity of the product or service offered, application, as well as potential market impact.

“HVACR as an industry is always changing in new and exciting ways at all professional levels,” continued Stevens. “Companies on the AHR Expo Show floor are listening to their stakeholders and developing new tools, products and services that make the industry more efficient, sustainable, smart, etc. Conversation is key and learning from each other at all levels within the industry is what drives innovation from year to year. We see it every year walking the exhibitor booths. It’s incredible.”

“We want to formally congratulate each of our 2021 AHR Expo Innovation Award winners, as well as finalists and all our entrants, for their continued leadership and contribution to HVACR,” said Stevens. “We look forward to seeing these innovators in the marketplace in the coming year, and in-person on the Show floor in 2022.”

The 2021 AHR Expo Innovation Award Winners and finalists were selected in ten industry categories, including building automation, cooling, green building, heating, indoor air quality, plumbing, refrigeration, software, tools and instruments, and ventilation.

BUILDING AUTOMATION

Winner: Infinitem Electric - Infinitem Electric IEq, a High-Efficiency Silicon Carbide VFD

Innovation: Infinitem Electric's IEq is an alternative solution to replace 30 year old insulated gate bipolar transistors (IGBTs) based VFDs. The high-efficiency silicon carbide (SiC) VFD offers a smaller, smarter, cooler and more efficient motor controller with integrated IoT capabilities in one single unit.

Introduction of VFDs allowed both commercial and industrial applications the ability to vary the speeds of fan, pump, or compressor applications. This led to a step-change improvement in the industry's overall energy consumption. However, one limiting factor remained—the VFDs efficiency stagnated at ~88-94%.

Infinitem's new Silicon Carbide IEq delivers the latest step-change improvements to motor control efficiency, size and packaging enabling OEMs and End-Users to deploy the technology in more varied environments. Additionally, it includes tightly integrated IoT sensors, for vibration, temperature, power, etc., a microcontroller and a one-way "data diode" IoT cellular modem gateway, which enables OEMs and end-users overseeing multiple facilities to more easily aggregate this data across thousands of installations, enabling deeper insights into the performance and reliability of their application. The on-board controller analyzes the high-speed IoT sensor data in real-time to provide immediate predictive analytics back to end-users. This innovation allows a wide range of OEMs to rethink how they deploy VFDs in new ways not previously available.

Finalists in this category include: BrainBox AI - *BrainBox AI Solution*; Emerson - *Verdant ZX Series Energy Management Thermostat*

COOLING

Winner: Emerson - Copeland™ ZPK7 Fixed Speed Scroll Compressor

Innovation: The Copeland™ ZPK7 scroll compressor developed by Emerson is the most efficient fixed speed compressor ever produced in the 100 year history of Copeland. The

innovative next-gen Copeland compressor, now in its 7th generation, is available in 1.5-5 ton and can be applied in both residential and commercial applications. What's more, it supports the HVAC industry with optimized efficiency by providing up to 5% efficiency improvement at the SEER2 B rating point condition and key HSPF2 part load operation conditions. With regulation-ready performance, the compressors are optimized for use with R410A refrigerant, but will also offer a lineup optimized for low GWP refrigerants, such as R32 and R454B.

This innovation provides improved efficiency and reduced variability, which will allow OEMs to effectively meet the 2023 efficiency standards while also delivering comfort and energy savings for homeowners and building owners.

Finalists in this category include: MRCOOL - *MULTI-ZONE/DIY Series Ductless Mini-Split Heat Pump*; Smardt Chiller Group Inc. - *Smardt V-Class Water-Cooled Chiller Range*

GREEN BUILDING

Winner: Advanced Cooling Technologies - Pump-Assisted Split Loop Energy Recovery Heat Exchanger

Innovation: Advanced Cooling Technologies' Pump Assisted AAHX recovers energy from either the exhaust or supply air stream during all seasons, allowing AHUs to consume less energy. It works by combining traditional air-to-air heat pipe technology with pumped two-phase systems that take advantage of both operational modes. In passive mode, which activates when the warmer air stream is physically below the cooler air stream, the heat exchanger operates as a heat pipe with no electrical input required. When the seasons change and the relative temperature of the two air streams is reversed, a small pump is utilized to maintain the transfer of energy. Since the method of heat transfer inside of the heat exchanger utilizes the latent heat of the working fluid, the amount of flow rate required to transfer larger amounts of energy is a fraction of an equivalent glycol loop. The combination of passive operation for at least half of the year and very minimal energy consumption during active operation for the other half of the year enables such high overall energy recovery from this product.

The heat exchanger is compatible with large systems or distance. Additionally, optional active control valves and pump controls allow the heat exchanger to provide relatively precise temperature control and defrost capabilities without the need for volume inefficient bypass. This innovation solves some of the HVAC's industry's issues such as: allowing for clean air with no cross-air contamination; it is highly-efficient and has

high-performance ratings using two-phase heat transfer; and it has added reliability through redundancy and fluid selection. It also removes the restrictions on hardware placement that current system designers struggle with, therefore also removing the need to trade off system packaging and energy recovery. This innovation will free up designers to develop new system layouts for better building air distribution and return, as well as allow for the optimization of air flow in their application without having to sacrifice energy efficiency.

Finalists in this category include: ebm-papst Inc. - *RESET® Certified RadiPac Air-Mover*; Enginuity Power Systems Inc. - *Enginuity Quadra-Gen*

HEATING

Winner: Viega LLC - Radiant Auto-Balancing System (RABS)

Innovation: The Radiant Auto-Balancing System (RABS) introduces the ability to monitor the temperature of every return circuit in a radiant system. Coupled with the monitoring of each zone's air temperature via wireless thermostats, the control actuates flow of conditioned water to each loop using a learning algorithm to increase the efficiency of a radiant installation. Circuit lengths no longer need to be designed to be similar lengths or manually balanced using flow controls on the manifold. Even though designing similar length circuits is still best practice, designs rarely account for furniture and temporary floor covering. The system maintains set temperatures through changes in these variables without user input, giving designers more flexibility without loss of efficiency.

This innovation will offer a desirable solution to customers seeking high efficiency radiant. The system also incorporates more digitalization of plumbing for monitoring by end users, something that is sought after more and more by customers looking to have more interesting and useful data related to their system performance. Additionally, this system will save installers valuable time when balancing a radiant system. Once the system is connected to a manifold and the web application, the customer has the ability to make changes and monitor temperatures.

Finalists in this category include: Ecoer HVAC - *Ecoer Home Comfort Systems with IoT Technology*; Burnham Boilers - U.S. Boiler Co. - *Alta Combi*

INDOOR AIR QUALITY

Winner: Des Champs Technologies - Des Champs Technologies Series PLP Air-Trap™

Innovation: Des Champs Technologies Series PLP Air-Trap™ offers a new concept in condensate trap design that permits condensate removal from AC or other condensing equipment while blocking airflow all year and requires only 2 7/8" height for positive 0-40" WC pressure. The trap can never "dry out" or freeze because it does not depend on water to seal, only fan pressure.

The innovative PLP trap is the first AC condensate trap to use air pressure developed by the AC fans to prevent conditioned air from entering or leaving the unit. For a hundred years the P-Trap, a carryover from use on toilets and sinks, has been used on AC equipment to prevent air loss. Unlike the P-Trap, the PLP was designed specifically for HVAC equipment and does not require standing water to prevent air leakage. AC equipment produces condensate mostly during summer. The remainder of the year little or no condensate is produced, and the P-traps are dry most of that time. When they do have water, the bottom of the trap is prone to develop sludge and growth. The PLP operates dry when no condensate is being produced and uses a levered, horizontal pancake designed float-valve with a mechanical advantage about a pivot point.

Finalists in this category include: EffectiV HVAC Inc. - *PLAY-UV Adjustable UV Diffuser for High-Efficiency Filtration and Ventilation*; TSI Inc. - *Q-Trak™ XP Indoor Air Quality Monitor*

PLUMBING

Winner: Caleffi Hydronic Solutions - AngleMix™ Angle-Style ThermoStatic Mixing Valve

Innovation: The Caleffi AngleMix™ 520 series thermostatic mixing valve accurately controls mixed water temperature in residential and commercial domestic hot water systems. It is the industry's only thermostatic mixing valve with an angle-styled body. This geometry minimizes the number of elbows required which reduces overall installation cost. Additionally, AngleMix is the industry's only thermostatic mixing valve that can close off its hot and cold ports at 100% tightness, preventing temperature creep or droop.

The innovative Caleffi AngleMix™ 520 series easily mounts at the tank-type, or tankless type water heater outlet and the angle-style body mixed temperature outlet is in line with the water heater outlet. This facilitates straight-line piping which reduces pipe elbows and overall space required for installation. The AngleMix has a lockable set point adjustment knob and includes a temperature gauge on the mixed temperature outlet for instant verification of temperature. The precision engineered anti-scale internal components

minimize service requirements, assure smooth operation and long life, and compensate for temperature and pressure fluctuations of the incoming hot and cold water. Available in a wide variety of end connections, the angle style body design is compatible with all common pipe types and connection styles from ½” to 1” sizes. AngleMix is certified to ASSE 1017 standard for point of distribution domestic water systems.

Finalists in this category include: GE Appliances, a Haier Company - *Electronic Water Heater with Smart Integrated Mixing Valve*; Uponor - *Uponor PP-RCT Pipe and Fittings*

REFRIGERATION

Winner: Officine Mario Dorin Spa - *CD600 Range*

Innovation: Officine Mario Dorin Spa’s CD600 Range is the largest CO2 transcritical compressor platform available worldwide. The CD600 Range features UL and CSA approvals. Based on a 6 cylinders design, this platform includes models up to 100 hp and 2200 cfh with utmost efficiency levels and premium reliability standards.

This new range of compressor is unique in the market because it nearly doubles the refrigeration duty deliverable with a single compressor. This often leads to a lower number of refrigeration racks and allows for a smaller required footprint for machinery. What’s more, the limited footprint and height allow for a decrease in installation and building costs when compared to an ammonia solution.

Finalists in this category include: ebm-papst Inc. - *AxiEco Protect Axial Fan*; Emerson - *Copeland™ Digital Outdoor Refrigeration Unit, X-Line Series*

SOFTWARE

Winner: Willdan - *NEO Net Energy Optimizer® Energy Modeling Software*

Innovation: The Willdan NEO Net Energy Optimizer® is a SaaS platform that provides customized, real-time energy and financial ROI analyses in seconds. The energy modeling software streamlines whole building analyses of HVAC systems and energy conservation measures for commercial buildings with the versatility to support product comparisons, existing building energy audits and new construction from early design through construction. NEO uses default inputs from vetted industry standards (ASHRAE, COMNET, RS Means) to automate the modeling process. All inputs are customizable where additional

details are known. NEO supports 40+ commercial building types (including mixed-use and multifamily) and 250+ operational and capital improvement measures coupled with automated ASHRAE Standard 90.1 and IECC baselines. NEO performs HVAC life-cycle cost analysis to help users make faster, more-informed HVAC decisions and rating analyses to empower users to evaluate the ROI of energy conservation measures to assist with specifying, designing and maintaining higher-performing buildings. NEO increases efficiency of product selection and design decisions by providing both energy savings and ROI information. NEO graphically reports results, generates downloadable input/simulation files, and creates CSV and MS Word documents detailing key model inputs and outputs. NEO is web-based, touch friendly, and requires no software installation.

Finalists in this category include: Distech Controls- *Builder*; Lennox International Inc. - *CORE Service App*

TOOLS & INSTRUMENTS

Winner: INFICON - D-TEK® 3 Refrigerant Leak Detector

Innovation: INFICON's D-TEK 3 Refrigerant Leak Detector is the latest in a line of time-saving service tools for HVAC/R. This leak detector provides industry-leading sensitivity to find the smallest leaks for all common refrigerants, maximum uptime from its long-life, quick charging lithium ion battery, and unmatched versatility from the ability to use multiple sensors. D-TEK 3 is designed to use INFICON's next generation infrared sensors, allowing it to search for leaks from classic refrigerants, CO₂, and flammable refrigerants with just a quick sensor change.

For even more versatility, D-TEK 3 is equipped with 4 sensitivity levels to help search for different leak sizes and two operating modes. Pinpoint mode works like a traditional leak detector and automatically zeroes to the background refrigerant. Manual Zero mode will not zero to the background until the user presses a button, allowing for more control in the leak checking process.

D-TEK 3 will help technicians find even the smallest leaks quickly and reliably.

Finalists in this category include: Alert Labs - *Sentree A/C Monitoring System*; H2O Weld LLC - *Oweld Water Gas Generator*

VENTILATION

Winner: Aldes - *CAR3® - Next Generation in Precise Airflow*

Innovation: The CAR3® constant airflow regulators by Aldes feature a state-of-the-art design with industry exclusive dual-side airflow adjustability and greater airflow ranges for a variety of applications. The patent pending airflow technology allows you to set or change the airflow quickly, in supply or exhaust applications, without removing the CAR3 from the duct.

The technology is capable of maintaining constant airflow within +/-10% of the scheduled flow rates, within the operating range of 0.12 to 1.2 in. w.g. differential pressure for low-pressure models (CAR3-L), or 0.4 to 2.8 in. w.g. with high-pressure models (CAR3-H). CAR3 solely operates on duct pressure and requires no external power supply or sensors, and will be rated for use in air temperatures ranging from -25°F to 140°F (-32°C to 60°C). CAR3 must be equipped with a double lip gasket to provide a secure, leak free installation into rigid round duct, take-offs, collars, etc. Each regulator features a dual-side adjustment dial to allow for changes in airflow setpoint while installed in either the supply or exhaust direction without removing the regulator from the duct. Regulator is classified per UL 2043 and carries the UL mark indicating compliance. The constant airflow regulator is enhanced with antimicrobial, anti-static, and flame retardant additives for increased durability and safety, and covered under warranty for a period of no less than seven years.

Finalists in this category include: ebm-papst Inc. - *AxiEco Perform Axial Fan*; Kingspan Insulation LLC - *KoolDuct*

“We continue to be surprised by what the innovators in this industry bring to market,” said Stevens. “It will be exciting to see these products and services come to life in the marketplace, and to see how they inspire others to think outside the norms and develop new solutions in the coming years. Once again, we wish to extend our congratulations to each of our 2021 Innovation Award winners, finalists and entrants on their continued excellence in the industry.”

The AHR Expo provides a unique forum for industry professionals to meet under one roof to share ideas, discover new products and technologies and find solutions to the industry’s technical problems. The 2021 AHR Expo in Chicago has been canceled. Registration for the

2022 AHR Expo slated for January 31-February 2 in Las Vegas, NV will open in summer 2021. Visit the AHR Expo website for updates and to sign up for the Show newsletter.

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