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THE ACR JOURNAL

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Essential Information for the Air Conditioning and Refrigeration Industry

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Welcome to the October / November edition of The ACR Journal.

Chillventa is upon us and all the evidence suggests this year's exhibition will be as impressive as ever. The ACR Journal and Heat Pumps Today team will be heading to Germany, so if you would like to discuss opportunities to work together or to say hello, please get in touch. I'm looking forward to seeing some of you there.

Two important deadlines will pass before our next edition. The first is the submission date for the ACR & Heat Pump Trainee Of The Year Awards — 21 September. The awards will take place on 5 December at the Leeds Marriot Hotel. Entries can be submitted at **https://www.acrjournal.uk/acr-trainee-of-the-year**.

The second deadline date is for the National Air Conditioning, Refrigeration and Heat Pump Awards, taking place in Manchester on 6 March 2025. If you have a product, project, or innovation you would like to put forward, the entry deadline is 6 December.
You can submit entries here: **https://www.acrjournal.uk/national-acr-heat-pump-awards/**

In this edition, Phil Godbehere of BITZER UK discusses the benefits of modern ammonia systems, Tom Burniston of leak detection manufacturer SAMON explores measurement principles in refrigerant gas detection, and Mark Fishwick of Inergy Group looks at how evaporative cooling can be better for businesses and energy bills.

Finally, Emmie Fletcher of Green Point UK features in the ever-popular Women in the ACR Industry feature.

I hope you enjoy this edition.

Andy

REGULARS

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Ask ME*
about decarbonising heating

*Beth Roberts, Account Manager London North

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PROUD WINNER 2023

NATIONAL ACR & HEAT PUMP AWARDS 2023 WINNER

rac COOLING INDUSTRY AWARDS 2023 WINNER

MITSUBISHI ELECTRIC

BESA training aims to inspire engineers of tomorrow

The Building Engineering Services Association (BESA) has launched a new training programme to help its members to work more closely with schools and inspire future generations of building services engineers.

The BESA School Engagement and Engineering Discovery (SEED) Programme is fully funded by the association and was developed by the schools engagement specialists Built Environment Skills in Schools (BESS) which has worked with more than 4,000 schools across the UK.

The 12-week programme is designed to give engineers and business owners the skills and knowledge they need to engage effectively with their local schools and promote career opportunities in the building services industry.

The training will be delivered in three tranches with eight places available on the September intake with another eight in January 2025 and a third cohort setting out on their engagement journey in April.

BESA members regularly cite long-term skills shortages as the biggest challenge to their businesses and this new fully funded scheme is part of the association's response. Members will now have the chance to work with experienced educators to gain insights into engaging the interest of school children and inspiring them to want to work in a sector that can make a huge difference to major social issues like climate change, air quality, and health & wellbeing.

"This is a groundbreaking exercise for our industry and an opportunity not to be missed," said BESA's head of skills & policy Stuart Rattray. "Early adopters can demonstrate their commitment to education and community involvement which will boost their reputation.

"It also gives them the opportunity to spot and nurture young talent early, creating a direct pipeline of future apprentices and employees who are already familiar with the company and the work opportunities available in our sector."

More information is available at: **https://www.thebesa.com/school-engagement-and-engineering-discovery**

IOR building for the future with LEGO kits

IOR members who volunteer as STEM ambassadors will have access to a new resource — a LEGO refrigeration plant kit.

The innovative approach to getting young people interested in refrigeration was created and funded by FJB and will be donated to IOR STEM ambassadors to form part of their STEM toolkit to take into schools and careers fairs. The LEGO "build your own fridge" kits provide all the building blocks for a fridge plant alongside instructions and a guide to how a fridge system works. It links directly to the IOR FantasticFridges.com website that has refrigeration system and component demonstrations and highlights some innovative applications of refrigeration technology as well as promoting careers.

Edwin Bowater of FJB said: "The refrigeration industry needs to be focused on inspiring young people to become interested in refrigeration and entering this wonderful industry. Lego is a universal language that people of all ages enjoy and understand – most people will use their fridge daily and not even think of how it works. These kits provide the fun of building Lego, whilst explaining how a basic refrigeration system works. Interestingly, since developing this, there seems to be as much interest from all ages!"

Individuals interested in becoming STEM Ambassadors and/or businesses interested in supporting the Institute's educational outreach can contact the IOR at **www.ior.org.uk/about/contact-us**

Johnson Controls acquires Password Services

Johnson Controls has acquired Midlands-based Password Services (Holdings) Limited including Password Services (Air Conditioning) Limited, a specialist HVAC service and solutions provider.

Established more than 25 years ago, Password Services provides a range of HVAC services and installations. Specialising in rooftop air conditioning within the hospitality sector, the company has been a distributor and partner for the Johnson Controls' YORK equipment brand for more than 20 years.

Michael Anderton, General Manager HVAC-R, at Johnson Controls, said: "Password Services is a well-recognised HVAC service and solutions provider in the UK, having built the company's reputation on delivering outstanding service to their customers. Our two companies have a long history of working together and we are excited by the opportunity to build on our shared history."

In the immediate future, Password Services will operate as usual whilst Johnson Controls works to integrate the business into its UK platform. The current business owners, Richard Schlanker, Alison Adams and Elaine Tovey, plan to remain with the business together with the full Password Services team of engineering, service, and project delivery teams.

Fujitsu welcomes PACAIR as Applied Partner

Fujitsu General Air Conditioning UK has formed a new partnership with PACAIR for its full range of applied products.

PACAIR specialises in the bespoke design and distribution of air conditioning solutions, with particular focus on air source heat pumps, 4-pipe multi-functional heat pumps, chillers and close control systems.

A highly-skilled applied projects team offers support to customers from PACAIR's base in Hemel Hempstead and regional offices in the North West and Midlands.

Deane Flint, Chief Operating Officer at Fujitsu General Air Conditioning, said: "PACAIR is a leader in the industry, and this applied partnership marks a significant opportunity for our businesses. We look forward to seeing the positive impact the new partnership will bring."

Nigel Palmer, Managing Director at PACAIR, added: "We pride ourselves on the advice and technical support that enables us to provide the customer with complete 'Cradle to Grave' solutions. Working with Fujitsu makes our offering even stronger."

From left, PACAIR Director Nigel Palmer, Fujitsu Commercial Director Martyn Ives, PACAIR Applied Product Director Kris Robinson and Fujitsu Chief Operating Officer Deane Flint

A-Gas launches MyShare programme

Refrigerant specialist A-Gas has launched its MyShare programme, an employee-shared ownership scheme aimed to influence employees to take greater pride in their work, be more accountable, and deliver against personal and company goals, with cash payouts when investment cycles conclude.

A-Gas Group CEO Jack Govers said: "This is a huge step for A-Gas, and I am pleased to provide these unique benefits to all our people worldwide. It helps bring our global teams together to focus on the success of A-Gas while rewarding the contributions made by every employee.

"In addition to recognising and rewarding employee contributions, A-Gas aims to strengthen its company culture by fostering a sense of ownership. The MyShare programme encourages employees to think, act, and feel like owners, enhancing engagement and alignment with the company's goals and values.

A-Gas Commercial Director Louise McCann added, "With this initiative, we are giving our team the chance to be part of something. Sharing our company's success with everyone who works for A-Gas shows that we are all in this together."

Williams salutes long-serving staff

Commercial refrigeration manufacturer Williams Refrigeration recently honoured some of the company's longest-serving employees, presenting awards to ten people with at least 20 years of service.

Purchasing manager Robert Smith, at 30 years of employment with the company, is ten years ahead of the rest. He gave his thoughts on the reason why staff retention is high at Williams Refrigeration: "I never get bored; it always challenges me! The trust to be allowed to make a vital decision, the support, the fast pace, and how Williams is always moving."

With 20 years of service, Steve Leslie, managing director at Williams Refrigeration in Scotland, thinks that staff staying a long time is itself a factor in retention. "Their experience means they know exactly what's required, which makes life much easier for everyone," he says. "The team is a great bunch, and it makes my working life enjoyable."

Smith identifies that the most significant change over the years has been technology. Ian Wiggins (20 years' service), production operative at Williams' plant in King's Lynn, agrees, "The products we make are more environmentally friendly now, which is a great thing. There've also been big advances in health and safety."

Managing director of Williams Refrigeration, Tim Smith, said: "We have a wonderful record of long-serving staff," he says. "Each year, we honour the ones who make these milestones, and each year, I'm humbled by their commitment and loyalty. I'm proud of the whole team we have here; every single one of us contributes to our success."
The ten award winners are:

30 years

- Robert Smith, purchasing manager, King's Lynn

20 years

- Darren Hall, technician, King's Lynn
- Michael Steward, stores operative, King's Lynn
- Ian Wiggins, production operative, King's Lynn
- Lynette Wixey, purchase ledger supervisor, King's Lynn
- Paul Mason, production operative, King's Lynn
- ee White, senior refrigeration design engineer, King's Lynn
- David Hayton, warehouse operative, Central Contracting Unit, Doncaster
- Stephen Leslie, managing director, Scotland Contracting Unit, Edinburgh
- Steve Langford, sales project manager, Southern Contracting Unit, Maidenhead.

CIAT supplies AHUs for sustainable studios

CIAT has supplied three air handling units (AHUs) for a new performing arts centre in the Chiltern Hills.

Garsington Studios, part of Garsington Opera, is a multi-purpose venue for rehearsals, recordings, filming, events and meetings. The project was committed to renewable energy sources but the greenfield site and unpredictable weather conditions made logistics and on-site work difficult, impacting material delivery and scheduling. To mitigate these challenges, CIAT's team proactively managed the project in phases to ensure the installation stayed on track. The CLIMACIAT AIRACCESS AHUs were delivered and installed before the building's walls were constructed.

The acoustic and thermal requirements demand precise control over noise levels and temperatures across multiple rooms, including recording studios and the main auditorium. These concerns were addressed with acoustically lined plenums and ducting, meeting stringent noise ratings and minimising ventilation noise to create an optimal acoustic environment for performances and recordings.

“CIAT's AHUs were selected for their competitive pricing, fast lead times, and advanced features,” said Chris Harrington, Project Manager at mechanical design and build contractors Arcade UK. “Their built-in noise attenuation ensures minimal disruption during rehearsals by achieving a supply air noise level of 58 dBA and enabling a Noise Rating standard of 15 (NR15).”

The system's energy efficiency is improved by the addition of a thermal wheel for heat recovery, together with a free cooling mode using untreated outdoor air.

BREng rolls out apprentice programme to help meet demand

Low-carbon cooling and heating specialist BREng is expanding its workforce in what is says is a response to growing demand for its services nationally. The first apprentice to be appointed is Adam Sykes, 17-year-old trainee, based at the company's headquarters in Hull.

He will follow a three-year Level 3 course funded by a government training grant, with specialist modules in HVAC and electrical theory and the option to progress to Level 4/5/6 degree-level equivalent qualification.

The initial focus will be on training in HVAC design calculations and a solid grounding in CAD, before moving on to specialise in the electrical side of HVAC projects. The training includes CIBSE courses and in-work support from specialists co-opted from local contractors embedded within BREng to expand its skills base, with reciprocal arrangements for BREng specialists to support collaborating companies.

Rob Smelt, Managing Director of BREng, said: "The goal is to develop Adam into a fully qualified building services project engineer, ensuring a 360-degree understanding but with a bias towards the electrical side of HVAC systems, to complement BREng's existing capabilities.

"Demand for low carbon cooling and heating is expanding at a tremendous rate. The need to decarbonise the national building estate will require a huge increase in manpower and skills to achieve the UK's net-zero targets. We aim to play our part by helping to recruit and train the new generation of engineers and designers needed, with further apprentices joining shortly to ensure we have a pipeline of talent with the right skills for the future."

New home for IOR Annual Dinner in 2025

Bookings are open for next year's Institute of Refrigeration (IOR) Annual Dinner, which will take place on 27 February at a new venue – the London Hilton Bankside.

Members and guests will gather to celebrate the RACHP sector, while supporting the IOR's work in education and promoting industry standards. The event also provides the backdrop for the IOR Awards which recognise the dedication and achievements of individuals in the industry:

- J&E Hall Gold Medal for outstanding technical achievement
- Ted Perry Award for student research and innovation
- The Kenneth Lightfoot Medal for the best paper presented to IOR last year
- The Service Engineer Lifetime Achievement Award which is given to an individual with a solid commitment to a career in service, maintenance or installation engineering.
- The IOR Beyond Refrigeration Award which rewards an innovative project leading the way in achieving low-carbon cooling.

Time is running out to submit nominations for the Service Engineer Lifetime Achievement Award, sponsored by ACR Journal, which includes a £400 cash prize. The deadline is 15 November and nominations can be made **https://ior.org.uk/about/IOR-awards.**

To find out more about this year's IOR Annual Dinner and to book tickets, visit **www.ior.org.uk/events/annualdinner.**

Smith's mission to raise the profile of press

Martin Smith, Conex Bänninger's newly appointed Business Unit Director for UK & Ireland, says he wants to help create a new generation of press fitting installers.

He said: "I want to sponsor a debate amongst traditional installers and contractors on how they can benefit from a change in technology – by moving away from traditional brazing methods.

"Whilst this process has been underway for a number of years now, we still need to drive home the key message that it's not always a great idea to be using a naked flame in constricted spaces and there are much safer, faster and more efficient ways to join pipes.

"The increasing use of press fittings is an excellent example of how a change in technology can offer installers real competitive advantage.

"Press fitting offers substantial benefits over traditional jointing methods, including faster, safer installations, consistent and reliable connections, minimal disruption, environmental advantages, cost effectiveness and ease of inspection and maintenance."

Significant numbers of installers who have been brought up using traditional jointing techniques are, understandably, resistant to making the change. One of the biggest barriers to change is the initial cost of a press tool.

But Smith believes that installers often look at the purchase price without necessarily being aware of the overall benefits of press; and how short the potential payback time on the initial purchase of the press machine can be.

He also points out that investing in press removes the need for a hot works permit and having to stay on-site for hours after installation due to fire risk and health and safety reasons that can often be the case when working with flame-based fittings.

He added: "By supporting our innovative and extensive range of >B< Press fittings with best-in-class online, in-class and onsite training, we will continue to provide a first-class back up service to ensure that installers of all types can realise the benefits of an investment in press."

• **See Changing Faces, page 34**

IOR Northern Branch Golf Day raises £1,300

The first post-Covid IOR Northern Branch Golf Day was held at the stunning Close House, near Newcastle, and welcomed a mix of familiar faces and first-time participants.

More than £1,300 was raised for the Sir Bobby Robson Foundation, which funds projects within the Newcastle upon Tyne Hospitals NHS Foundation Trust that directly benefit cancer patients from across the region and contribute significantly to international research into the disease.

The day saw a mix of cloud and sunny spells, with a stiff breeze at times to keep the competitors on their toes. There was also a surprise addition to the line-up, with Premier League referee Michael Oliver stepping in to help make up a team that was short of players!

Team winners were wholesaler DW, with UNG taking second place and Ventilation Supplies third.

Individual prize winners were:

Nearest Pin: Callum Thompson (Green Zone Survey)
Longest Drive: Dan Wood (Acrol)
Long Putt Challenge: Steve Mclean (Acrol)
Beat the Pro: Jon Douglas (Project Refrigeration)

Wholesaler DW took the team prize

The IOR Northern Branch extended its heartfelt thanks to all who participated, volunteered and contributed in various ways to make the event a resounding success, with special thanks to all sponsors and Close House for the essential support and prizes.

Given the success and positive feedback from the event, planning is already underway for next year's golf day and annual dinner. More information will be published on the IOR Northern Region Branch Linkedin page.

R449 for high volume compact freezer

A moving-belt cycle/blast freezer based on BITZER Ecoline compressors using R449A refrigerant aims to enable food producers to increase production in space-restricted sites.

David Thirtle AirCon and Refrigeration wanted to overcome the problems associated with traditional bulky industrial freezers, that can be difficult to accommodate and service.

Designer David Thirtle explained: "Historically, the industry has relied on large imported industrial freezers, which, while being high quality, have tended to be unsuitable for end users with smaller processing machines. They can also be expensive to maintain due to the need to source spares from the original manufacturer."

The new British designed and built BBF500 cycle freezer uses cycle crust freezing technology to ensure rapid, uniform freezing or crusting, preserving product quality and extending shelf life. It can be used with a wide range of food products, including seafood, meat, cheese and bakery items.

All components are sourced in the UK where possible, and assembled in Cambridgeshire and Tredegar, Wales, so spare parts are readily available from local suppliers, and in the case of the compressor, from BITZER UK / Green Point UK and approved wholesalers, reducing maintenance costs.

The first units to roll off the production line have been installed at a leading meat processor in Wales, which supplies national UK supermarkets.

With a capacity of up to 500kg per hour, the BBF500 is designed for high-volume production, integrating with industry-standard TVI GSA 400 slicer and similar food preparation machines.

Product and process temperatures can be set between -25 and -42°C, enabling quality to be optimised across a wide range of applications. Equipped with a Siemens controller, belt speed can be finely tuned to suit the product.

The compact stainless-steel unit, measuring H 2.41m x L 2.4m x W 2.2 m and with a 900mm wide moving belt, has full factory internal specification to withstand the demands of industrial freezing environments. Bespoke variants can be made to suit requirements on specific sites.

The company is now developing two higher capacity cycle crust freezers, the BBF800 and BBF1200, with outputs of 780kg and 1200kg per hour, respectively.

It is also collaborating with BITZER UK on a CO_2-based version for end-users seeking the lowest possible Global Warming Potential (GWP) refrigerant, which will be available by the end of the year. A retrofit solution to convert HFC/HFO-based freezers to operate on CO_2 is also under development.

Contingency planning and rapid chiller hire keeps MRI scanners operating

Rapid deployment of a chiller from the ICS Cool Energy hire fleet ensured the continuous operation of MI scanners at a London hospital.

Hospitals require all-year round cooling across their facilities, to ensure vital diagnostic tools such as MRI scanners remain operational or to maintain the right temperature and humidity levels in cold storage for multiple purposes.

A major hospital in London encountered an unexpected failure in its chiller equipment. The malfunction threatened to disrupt the operation of its MRI scanners. Given the hospital's vital role in the community and the critical nature of MRI services, immediate action was required to prevent disruptions that could have consequences for patient care.

The hospital's central location and busy environment necessitated careful planning to avoid disrupting other critical operations, such as ambulance services.

Solution

Before the malfunction occurred, ICS Cool Energy had been in regular contact with the hospital's estates team, discussing facility management improvements and contingency planning. This contingency planning was vital as it involved detailed surveys and assessments that laid the groundwork for a rapid and effective response when the equipment failure occurred.

Rapid deployment of an industry-grade i-Chiller 80kW unit from the ICS Cool Energy hire fleet was key to meeting the correct kilowatt duty and provide a reliable cooling for the MRI scanners to remain operational.

The ICS team worked with the hospital's estates team to manage logistics and integrate the hire unit with existing infrastructure and hospital operations. This included coordinating the lifting of equipment to roof level using specialist cranes, executed out of hours to avoid obstructing ambulance bays.

Result

The hospital, despite having multiple third-party maintenance contracts, relied on ICS Cool Energy's expertise and opted for a long-term hire of over 12 months, with ongoing support and maintenance to ensure continuous operation. The hospital's MRI scanners have remained fully operational, preventing any delays in patient diagnosis and treatment.

The i-Chiller 80kW unit is also said to have reduced electrical consumption costs.

A3 and high-performance!

ROBINAIR (a BOSCH company) has launched a range of pumps under the VacuMaster badge that are compatible with Class A1, A2, A2L and A3 refrigerant systems! Introducing the RA1530-A3, RA1550-A3 and RA1580-A3

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The RA1500-A3 exhaust venting kit has been designed for use specifically with VacuMaster pumps and allows for the routing of evacuated gases to a safe area when servicing systems that use flammable refrigerants. A remarkable 10 metres of hose is standard.

SPECIFICATIONS	RA1530-A3	RA1550-A3	RA1580-A3
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FREE AIR DISPLACEMENT	3 cfm (85 l/m) @60 Hz 2.5 cfm (71 l/m) @50Hz	5 cfm (142 l/m) @60 Hz 4.1 cfm (116 l/m)@50Hz	8 cfm (227 l/m) @60 Hz 6.6 cfm (187 l/m) @50Hz
ULTIMATE VACUUM	15 microns (2 Pa)	15 microns (2 Pa)	15 microns (2 Pa)
STAGES	2	2	2
MOTOR	300 watt	350 watt	660 watt
INTAKE PORTS	1/4" & 3/8" Flare	1/4" & 3/8" Flare	1/4" & 3/8" Flare
OIL CAPACITY	560ml	480ml	610ml
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WEIGHT	10.2kg	11.2kg	15.2kg

IMPORTANT!

System evacuation can be corrosive and damaging. Any debris entering the compressor can interfere with the vanes and compromise the desired vacuum. Most manufacturers recommend an oil change after every use (or 10 hours if you are on a big job). We recommend ROBINAIR Premium vacuum pump oil!

• BRA-13119 (.475L) • RA-13203 (.95L) • RA-13204 (3.8L)

Don't let your pump get like this →

KISS – Keep It Super Simple

Mitsubishi Electric Trainer, Steve Clarke explores why we should never assume anything with language and points to how simple language can keep us all safe.

ASAP, BBC, CAMRA, DJ, ENO ... I could go on with acronyms and abbreviations that are now part of our common language, but in these days of shorthand 'txt' speak, are we in danger of confusing things?

And can our assumptions that people know what we are talking about place us in actual danger?

From the list above, the BBC is one that means the same thing to everyone. So is CAMRA – a subject close to my heart in the search for real ales!

But ASAP, DJ, and ENO, well I bet you didn't realise I was talking about the Association of Serviced Apartment Providers, my Dinner Jacket, or the indigestion brand of tablets called ENO?

Language danger

In my role as a trainer, I meet people from the heating industry and people from the air conditioning and refrigeration industry and, like every other sector, they both have their own assumed language, but this is where it can get dangerous.

In plumbing terms, a PRV is a Pressure Relief Valve, which discharges if the pressure inside a heating system gets too much.

In the world of air conditioning though, a PRV is a Pressure Regulating Valve, which controls the pressure. For example, 5bar pressure coming in but only 3bar leaving the valve.

Steve Clarke, Mitsubishi Electric Trainer

Both are legitimate uses of the term and I've even seen schematics with both terms included. but they both have very different functions and very different outcomes.

Personally, I think PRV makes sense for pressure regulating valve and I would suggest that instead of pressure relief valve, we should refer to the other PRVs as safety valves – which is how they are sometimes also referenced.

Constant change

As a business, we recently created a commercial product group (CPG) and a residential product group (RPG) which makes sense internally.

However, the commercial group is aimed at businesses not consumers, so it's a tad confusing that a well-known acronym for CPG is Consumer Packaged Goods. And as for RPG, well that just says role playing games to me, or even worse, rocket propelled grenade!

Before using an acronym or abbreviation and assuming that the people you are talking to understand what you mean, it's worth remembering who decides whether your communication and the language you are using is effective or not – It's your audience, not you!

If you are speaking your own language, rather than speaking plainly in ways that cannot be misunderstood, then you are simply not communicating effectively.

Baffling people with catchphrases or code words that only you understand shows that you are not really paying attention to the recipient of your message.

After all, if people don't understand what you are saying, how can they ever learn from you or really know what you think?

So, we all need to stop making assumptions and PDQ (Pretty Damn Quick).

Instead, we need to choose clear, simple language that cannot be misconstrued.

You know the old maxim of what happens when we ASSUME! Remember, that applies to you and me!

Steve Clarke is a Technical Trainer at Mitsubishi Electric

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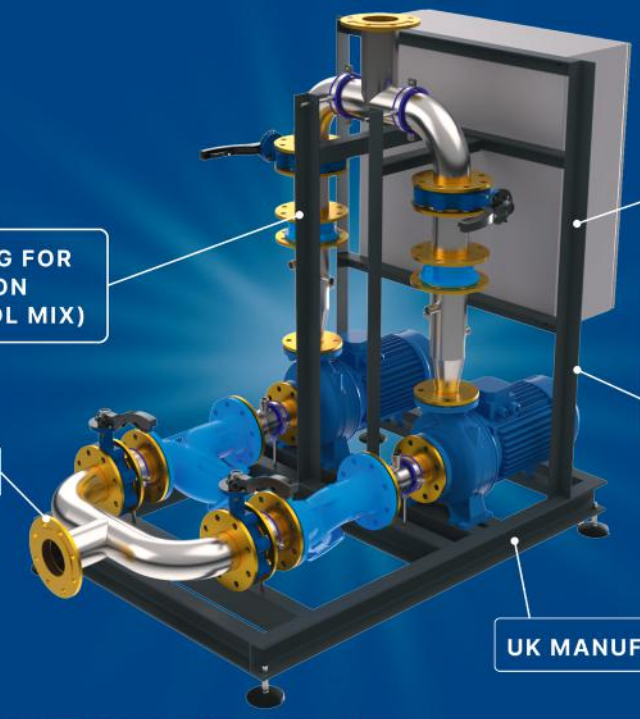

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Exploring measurement principles in refrigerant gas detection

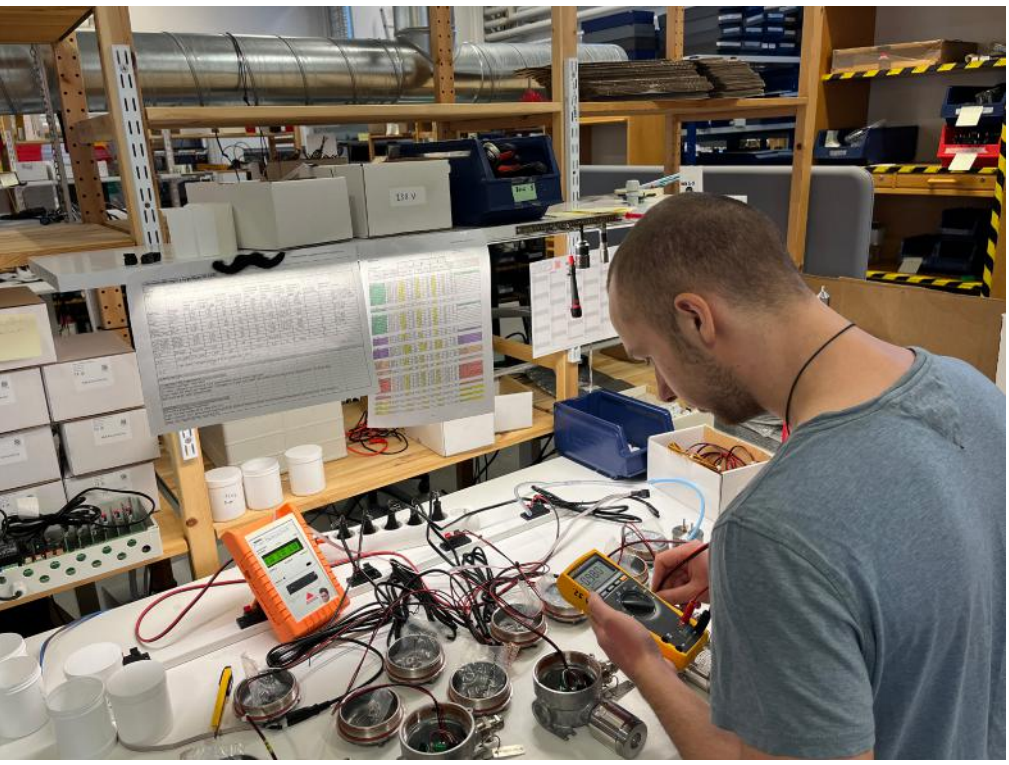
By Tom Burniston, SAMON Marketing Director and Group Product Management Lead for Safe Monitoring Group.

When safeguarding against refrigerant leaks, the choice of detection technology plays a pivotal role. A diverse array of gas sensor technologies stands ready to be deployed. Each technology boasts its own strengths and drawbacks, making the selection process a nuanced task. The journey begins with identifying the specific refrigerant to be detected and determining at what concentration level refrigerant gas alarms need to be activated, laying the foundation for informed decision-making. Delving deeper reveals that even within specific categories of refrigerant sensor technology, significant variation exists, necessitating a thorough understanding of the options and balance of benefits for the application against the cost of implementation. The dynamic landscape of gas sensor technologies needs unravelling to address the complexities of modern refrigerant detection.

Semiconductor sensors

Semiconductor sensors are versatile tools for refrigerant gas detection, detecting a wide range of gases at concentrations measured in parts per million (ppm) as well as in combustible ranges for flammable gases. Typically composed of metallic oxides deposited on a silicon wafer, the sensor's surface is heated to high temperatures. The composition of the mixed oxides and the operational temperature dictate the sensor's response to toxic gases, vapours, and refrigerants.

Despite their versatility, semiconductor sensors exhibit some drawbacks. They lack selectivity and can respond to any reducing gas, leading to potential false alarms. Additionally, they can be affected by factors such as water vapor, high humidity, temperature fluctuations, and low oxygen levels, further increasing the risk of false readings.



A technician checking sensor stability in newly manufactured gas detectors

False alarms can stem from exposure to various materials, including solvents, cleaning products, exhaust emissions, and hydrogen from electrical charging stations. In mitigation, an alarm delay function can be ensure that the leak detector does not trigger an alarm immediately, instead activating after allowing transient gases to dissipate and reducing the likelihood of false alarms.

While semiconductor sensors have their limitations, they are highly cost-effective and remain valuable tools in refrigerant gas detection applications, including HFC and HFO refrigerant leak detection. Understanding these limitations and employing appropriate mitigation strategies is essential for ensuring accurate and reliable gas detection in commercial industrial settings.

Infrared sensors

The fundamental principle of infrared sensor technology is the absorption of infrared radiation by the target gas to be measured. This applies to various gases, including HFCs and HFOs, and CO_2, whose chemical bonds absorb infrared energy at specific wavelengths within the infrared spectrum.

For HFCs and HFOs, the size of the optical bench, or rather the pathlength through which the infrared light passes through the gas, emerges as a critical factor influencing resolution and accuracy. Longer path lengths are essential for achieving high resolution and accuracy, generally restricting them to aspirated systems in refrigerant detection applications, due to the size and relatively high cost. This level of infrared sensor

technology, while superior in resolution and accuracy, may present challenges in deploying multiple sensors across a facility due to larger sensor sizes. Economic considerations further drive system design towards centralised configurations.

Smaller-format infrared refrigerant sensors are more commonly used in diffusion-based gas detectors, being more cost-effective and therefore more readily deployed in a distributed detection system. For CO_2 they are the standard. Whilst not offering the same level of precision or lower detectable limit for HFCs and HFOs, they provide the same advantages generally attributed to infrared gas sensor technology.

Infrared sensors enjoy immunity to cross-gas interferences in refrigerant applications, and good levels of resolution and accuracy. Temperature shifts are compensated for effectively within software, and the specificity of measurement targets only the refrigerant. It is unaffected by the type of transient interference that can affect semiconductor sensors.

A well-designed infrared sensor is very stable, cannot be poisoned, and is not prone to drift over time. This further reduces the risk of false alarms and ensures a long-sensor lifetime of ~10 years. This long lifetime and stability make infrared sensors particularly suitable for applications where sensors are integrated directly into appliances such as heat pumps or refrigerated display cases.

Although carrying a higher price-point, infrared sensing technology exhibits superior performance and achieves lower minimum detectable levels compared to semiconductor sensors when applied to HFCs and HFOs, further bolstering its appeal where there is benefit to be gained from detecting at a lower level. For CO_2, a refrigerant gas detector with an infrared sensor is the only realistic option, making the choice of detector important regarding its suitability for the application and installation environment. A refrigerant gas detector with a fast enough response time must be selected, to meet refrigerant safety standards requirements ensuring the safety of personnel at risk of exposure to a leak.

Emerging sensor technologies

New sensor technologies for the detection of refrigerants have begun to emerge over recent years. For the most part, these are limited to applications detecting in the range of flammability, giving out put in percentage of Lower Flammability Limit (%LFL) rather than in lower ppm levels.

Acoustic measurement technology functions via correlating how a target gas causes reduction in speed of a soundwave as it passes through the measurement chamber. Whilst claiming a reduction in the effect of environmental factors in comparison to more traditional refrigerant detection technologies, the range of detectable gases appears to be smaller, parts-per-million level measurement is not currently available for refrigerants, and comparison with the selectivity of infrared detection is unclear. Nevertheless, it is an interesting development in refrigerant gas detection options.

Molecular spectrometry gas sensors have been making an appearance in refrigerant gas detection applications, targeted to %LFL measurement of flammable refrigerants. With long sensor lifetime, immunity to poisoning, and no false alarms, for refrigerant gas detection the benefits appear to be similar to those of infrared refrigerant sensors, albeit for a more limited range of applications.

Electrochemical sensors for NH_3 leak detection

Semiconductor sensors can be used to detect high concentrations of ammonia approaching its LFL of 15%/vol., but lower-level detection at 25-300ppm is also needed due to the toxic effects at low concentrations. This is achieved by using electrochemical sensors.

Due to degradation from gas exposure, time, high or low humidity, or contamination the typical lifetime for most electrochemical sensors for NH3 is two years. There are, however, some refrigerant gas detectors now on the market with field-proven NH_3 sensors with a lifetime of five years.

There are some drawbacks to the use of ammonia sensors that should be noted to ensure proper maintenance routines and installation practices deliver an effective refrigerant detection system. The limited lifetime is vital to note, and the fact is electrochemical sensors come at a relatively high cost. Ideally the sensor, not the whole gas detector, should be possible to replace in the field.

This is balanced out by the positives of NH_3 detection with electrochemical sensors. There is a high degree of selectivity, and false alarms are not likely. Accuracy is very good, and low levels or ammonia can be detected reliably and effectively.

Selecting the right sensor

The choice of refrigerant gas detector and the refrigerant sensor technology used is by nature a subjective decision, depending on both the requirements of the application and the preferences of the user. What is certain is that there are choices available.

Specialist refrigerant gas detection suppliers are likely to carry a range of sensor types to meet the varied requirements of their customers. Most of the time, there is no one-size-fits-all approach to gas detection, so it is well advised to seek out a discussion with an expert to help make the decision that is right for each user or each project.

SAMON's GLACIÄR MIDI gas detectors newly calibrated and ready to ship

How refrigerant recovery can enable a viable future

As global temperatures rise, the use of air conditioners and other cooling applications is set to at least triple by 2050.

There are currently 3.6 billion devices in use today, but this could be almost 14 billion by mid-century if cooling is provided to all those who need it (IEA data).

The role of refrigerants, with both their cooling and heating properties, will be essential to keeping the planet hospitable for communities worldwide. Equally important will be the role that the Refrigeration, Air Conditioning and Heat Pump (RACHP) industry can play in providing environmentally responsible solutions.

Being a world leader in the lifecycle management of refrigerants and supplying the associated products and services, A-Gas is a company committed to being part of that change. Since being founded it has supported its clients and partners on their environmental journeys by supplying lower global warming gases and actively increasing the circularity of the industries it serves.

Its business strategy is outlined by its purpose: to protect and enhance the environment by effectively managing the lifecycle of refrigerants to build a sustainable future. Through its high-quality recovery, reclamation and repurposing processes, it captures used refrigerants with a high Global Warming Potential (GWP), minimising their potentially harmful release into the atmosphere.

Lifecycle Refrigerant Management (LRM)

Lifecycle Refrigerant Management (LRM) is an environmentally conscious model that aims to reduce potential emissions from refrigerant gases with a high GWP. It focuses on avoiding and reducing refrigerant leaks by recovering used gas and increasing reclamation to reduce the need for virgin production of new refrigerants.

According to Project Drawdown, LRM is one of the biggest opportunities to mitigate the risk of climate change. It predicts that these practices could save the equivalent of 57 gigatonnes of carbon dioxide emissions between 2020 and 2050. So how has the industry responded?

The Montreal Protocol, signed in 1987, banned the use of 100 Ozone Depleting Substances (ODS) in heating, ventilation, air conditioning and refrigeration (HVAC-R) equipment. Many industries replaced these with hydrofluorocarbons (HFCs), which are not ozone depleting, but do still have a high Global Warming Potential (GWP).

Later, the Kigali Amendment to the Montreal Protocol, signed in 2019, asks institutions to reduce the production and consumption of HFCs by 80% over the next 30 years.

These regulations are a great start, but there is still the question of what to do with the high-GWP refrigerants currently in use when they reach their "end-of-life"; and this is where a responsible LRM solution can add real value.

A-Gas and Lifecycle Refrigerant Management (LRM)

A-Gas' LRM offering is market-leading and wide-ranging. By recovering, reclaiming and repurposing (or where necessary, safely destroying) used gas, it increases the circularity of these products while minimising their potential impact on the atmosphere. These gases are used in many industries and applications, from car air conditioning systems to supermarket chillers, playing a role in daily life globally.

First, A-Gas' expert technicians recover the refrigerant using custom-designed equipment. Then, the product is transported back to the local A-Gas facility for further processing. In many cases, this means reclaiming the refrigerant to AHRI 700 standards, extending the gas' lifeline and creating an alternative that functions just as well as virgin products.

Not only does reclamation reduce the risk of these gases being released into the atmosphere; it also reduces the need for virgin production and the associated emissions. Where no future reuse is possible, the refrigerant is destroyed in a safe and environmentally responsible way, using a United Nations-approved, Technology and Economic Assessment Panel (TEAP)-certified methodology.

The greater the amount of refrigerant that is recovered, reclaimed and repurposed, the greater the potential to reduce greenhouse gas (GHG) emissions from the cooling sector, in line with net-zero initiatives.

In conclusion, reducing global emissions within the refrigerant industry can only happen through collaboration. The industry must seek viable alternative solutions to make a difference, and both refrigerant recovery and a wider LRM offering have a potentially huge part to play.

Want to learn more about LRM and A-Gas, come to meet with us at Chillventa, where A-Gas will exhibit with its booth in Hall 7 – Booth 7-340.

During the three days, customers, partners and visitors are welcome to stop by our booth and meet our experts to learn more about our LRM capabilities, recovery and reclamation and low GWP refrigerants.

We look forward to meeting you there.

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Proud to ride with the Whiteknights

ACR Journal editor Andrew Slater caught up with the recently-retired Paul Airey to discover how he is making a valuable contribution to a potentially life-saving Yorkshire voluntary service from the back of his motorbike

After 40 years in the air conditioning and refrigeration industry, with spells at Fujitsu General Air Conditioning UK and, more recently, distributor Oceanair, Paul Airey believes that while spending more time with his family is important, he still wants to help others.

Already a keen biker, he passed his Advanced Rider motorcycle qualification and signed up with Whiteknights Yorkshire Blood Bikes. This West Yorkshire-based charity provides a free, "out-of-hours" urgent transportation service for hospitals and hospices across Yorkshire. Volunteer, Advanced Qualified Riders work 12-hour shifts overnight and provide a 24-hour service at weekends.

"During normal weekday hours, the NHS has its own transportation service," he explains. "But people don't realise that out-of-hours, the delivery of urgent items such as blood and pathology samples, even urgent medications are often transported on an ad hoc basis by taxis and private couriers at huge expense to NHS Trusts."

More than just blood

In 2023, the Yorkshire Blood Bike charity estimates that their voluntary service saved the NHS £126,866 by making 3408 journeys and travelling 91,190 miles completely free of charge to the NHS.

Paul added: "I always thought of Blood Bikers delivering bags of blood; I didn't realise that the service they provide is of much more vital importance to the care and treatment of patients. As well as delivering vital medications to the homes of vulnerable patients, Whiteknights also make urgent deliveries of donated breast milk from donors to special care neonatal baby units often at very short notice. We will also link up with neighbouring Blood Bike groups to participate in national relays if a nationally transported consignment comes through our area.

"I get a huge sense of achievement by helping out. It's very well run, which makes it much easier, and the team of volunteers are fantastic. I miss the air conditioning industry, but I still have ties organising the Northern Refrigeration Golf Society, which gives me a lot of focus."

Established in 2008, Whiteknights Yorkshire Blood Bikes has a fleet of seven motorbikes, three of which are on duty every night of the year. This costs the charity between £5,000 and £6,000 per bike each year to operate. Fundraising is an essential income source, with estimates that for every £1 donated, the NHS and Hospices will save at least £5.

If you would like to find out more about the Whiteknights Yorkshire Blood Bikes, please visit: **https://whiteknights.org.uk/**

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HRS Golf Day a winner at Old Thorns

Media partners ACR Journal & Heat Pumps Today were delighted to support and attend the Hampshire Refrigeration Society (HRS) Golf Day at The Old Thorns, Liphook, as Juliet Loiselle reports.

A stunning course and scenery, with only a slight drizzle throughout, meant everyone enjoyed the competition. In excess of 160 players were in attendance and I spent most of the day whizzing around in my little buggy getting plenty of team photos. The day started with a Texas Scramble, which saw 'The Four Divots' (OCB) winning the 9-hole competition from the 1st tee, with iCool Refrigeration runners-up. Javac swooped in to win from the 10th tee.

After a filling brunch, the 18-hole Stableford commenced. Best net score came from Ashley Taylor (43), who won a Vax Spot Washer donated by Carel UK, ahead of Liam O'Donovan (38), who picked up a Regency Hamper courtesy of Climalife. Best gross score went to Marcus Pugh (33) who won a £100 golf voucher donated by DiversiTech, while runner-up was John McEvoy (28), who was presented with x2 VIP tickets to the National ACR & Heat Pump Awards. The team event saw A-Gas put together an impressive score of 82, with each player receiving an air fryer and bottle of champagne. Cool Designs Team 1 were runners-up and Carel UK third

Many thanks must go to all the generous sponsors who donated some magnificent prizes, which were presented to the winners and runners-up at the well supported evening meal. My favourite presentation was to Simon Hammond for the 'Needs to Play More Golf' prize. It's all about the taking part in my book.

18 Hole Stableford Results			
Best Net Score	1: Ashley Taylor (43)	2: Liam O'Donovan (38)	
Best Gross Score	1: Marcus Pugh (33)	2: John McEvoy (28)	
Team	1: Team A-Gas (82)	2: Cool Designs Team 1 (81)	3: Carel UK

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Modern ammonia systems: green and future-proof

Ammonia as a refrigerant is efficient, cost-effective and has outstanding green credentials. Phil Godbehere of BITZER UK highlights recent developments in design and manufacturing that address its well-known downsides, and open the way for more widespread adoption.

Ammonia is arguably one of the greenest refrigerants available. Due to its thermodynamic properties it is highly energy efficient, requiring the lowest energy input of any refrigerant to produce a given refrigerating effect.

In economic terms, not only are ammonia systems efficient and cost less to run, but the refrigerant itself is relatively inexpensive, even in the high-purity grade required for use in refrigeration. Given the large charges required by some industrial systems, this can translate into substantial savings over synthetic refrigerants.

In environmental terms, ammonia has impeccable credentials. Its zero Ozone Depletion Potential and Global Warming Potential, combined with its inherent efficiency, means ammonia has the lowest Total Equivalent Warming Impact (TEWI) of any refrigerant (where TEWI is the sum of the direct and indirect effects of an ammonia system on global warming over its lifetime).

Although ammonia is made through industrial processes for use in refrigeration, as the substance occurs in nature it is considered a natural refrigerant. Ammonia is part of Earth's nitrogen cycle and is produced in soil as a result of decomposition of organic matter. This contrasts with synthetic fluorinated refrigerants, which are entirely man-made and do not occur naturally in Earth's ecosystems.

For all these reasons, ammonia has been used in industrial refrigeration for more than a century. While there have been many changes in refrigerants used in smaller commercial refrigeration and air conditioning over this time, due mainly to growing understanding of their impact on the environment, ammonia has remained the industry's mainstay for industrial applications.

BITZER says its high efficiency ammonia compressor packs offer an attractive zero-GWP solution for industrial and large commercial applications

Mitigating risk

Against these major upsides, ammonia has two well-known and important downsides — being flammable in certain concentrations under certain conditions, and toxic. In terms of flammability, it is considered relatively low-risk due to its chemical affinity to moisture in the air. This gives it an advantage over hydrocarbon refrigerants, such as propane, which have a much higher flammability rating.

Ammonia's chief Achilles heel is its toxicity. The risk is mitigated to a degree by two factors: ammonia's distinctive, pungent smell is detectable at concentrations well below those considered to be harmful. This so-called "self-alarming" property is not shared by other potentially hazardous refrigerants.

Secondly, ammonia is lighter than air. In the event of a leak, it tends to rise and dissipate in the atmosphere. This contrasts with other common refrigerants which are generally heavier than air, and therefore tend to collect in depressions and pose an asphyxiation risk.

Recent advances in technology, system design and manufacturing have addressed these potential risks and open the way to

safer and more widespread application of ammonia cooling in the future.

For example, due to the nature of industrial refrigeration applications, ammonia systems have traditionally often been built as one-offs and assembled on site. This approach inevitably incurs additional risk due to the less-than-ideal conditions often encountered.

The recent move towards production of complete ammonia systems in pristine factory-controlled conditions eliminates the rough-and-tumble of working on site. Modern modular ammonia compressor packs are now built to the highest standard of quality assurance, ensuring system integrity and minimising the risk of leaks.

Ground-breaking projects

The availability of such high-quality factory-built, modular plug-and-play ammonia systems transforms the safety of ammonia refrigeration and, in turn, its perceived user-friendliness for contractors and end users.

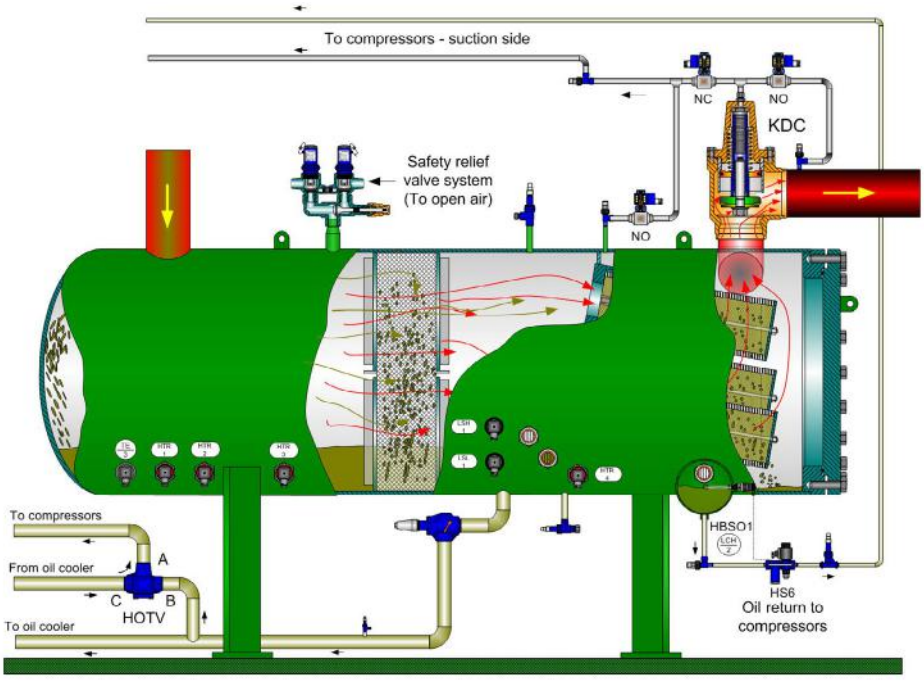
My own company has played a pioneering role in this regard, with the development of the BITZER ammonia compressor pack (ACP). The technology has been well received by end users and contractors in the UK, with some ground-breaking projects already successfully operating around the country.

Several systems have been installed to date here, in a variety of applications. These include a food manufacturing facility for a large high street bakery chain, a commercial ice-making plant, and a large pizza production site.

Key benefits include the pack's excellent part-load efficiency and resilience, with a back-up compressor in the unlikely event of a failure. Rapid installation and commissioning are made possible due to the plug-and-play design. Contractors can quickly connect up ACP units on site with a few simple pipework and electrical connections.

Crucially, ACP is built in factory-controlled conditions to ensure the highest standards of manufacturing for safety and leak tightness in the field.

The packs are based on BITZER high-performance screw compressors optimised for use with ammonia, which result in a smaller footprint than equivalent-capacity reciprocating compressors. In addition to the inherent efficiency of screw compressors, the speed of the lead compressor is controlled by an integrated variable speed drive (VSD), which significantly increases part-load efficiency and enables soft-start. Efficiency can be further enhanced with the addition of an optional economiser module.



Performance is enhanced by the new OAHC three-stage horizontal oil separator

Screw compressors also have much longer maintenance intervals than reciprocating compressors, reducing the cost of ownership over the life-time of the plant.

Use of either two or three compressors per pack gives standby capacity and resilience for critical process application where continuity of cooling is vital. It also enables engineers to service one compressor while the other remains operational, reducing process down-time and improving life-cycle cost.

Compressor performance is enhanced by the new OAHC three-stage horizontal oil separator, which significantly reduces oil carry over, typically within the range 2-5ppm.

For engineers, the design allows ready access to valves, sensors and connections during installation and servicing, with packs equipped as standard with Bluetooth connectivity and Modbus integration.

Attractive solution

Complementing ACP, advances in the design of ultra-low charge ammonia chillers also open up exciting possibilities. For example, the AMChill packaged chiller, developed by natural refrigeration specialist KGM Refrigeration Ltd with support from BITZER UK, runs on an ultra-low charge of ammonia, made possible by a new design that overcomes the need for a flooded evaporator.

Based on reliable open-drive BITZER W-series compressors optimised for use with ammonia, the chiller is designed for roof-top mounting without the need for expensive risk mitigation measures, such as high capacity exhaust ventilation, required in plant room applications.

The chiller's light weight and compact dimensions (1m wide by 1.6m long and 1.9m high) enable it to be easily transported onto rooftops without the use of a crane via a standard lift, saving installation time and cost.

Overall, we believe high efficiency ammonia compressor packs and low-charge chillers offer an attractive zero-GWP solution for industrial and large commercial applications, with the added benefits of factory-controlled production for maximum safety, and modular plug-and-play design for ease of installation and servicing.

With a modern approach and in appropriate applications, this long-established refrigerant provides a solution to one of the most pressing environmental challenges of our time.

https://www.bitzer.de/gb/en/

Strategies for achieving net zero in the construction industry

By Rachel Lekman, Sustainability & Construction Team, Mitsubishi Electric.

A significant portion of emissions in the UK – around 25% – are attributable to the built environment. Considering that 80% of the buildings we will occupy in 2050 are already built, retrofitting existing spaces is vital to lower overall emissions. However, decarbonising the UK's building stock presents a challenge for several reasons, including the complexity and cost of retrofitting and the need for significant technological upgrades.

But the path to net zero is more than just an environmental imperative; it represents a profound opportunity for the construction industry to innovate, adapt and lead. And with actionable strategies and collaborative efforts, it is possible to drive the building industry forward.

To succeed, building and engineering organisations must consider several key approaches for their own operations as well as for their customers. By focusing on existing technologies, prioritising operational expenses, collaborating across the supply chain, and using advanced monitoring systems, the construction industry can make significant strides towards achieving net zero.

The critical role of standards and legislation

Developing a unified system of standards and legislation is essential for the construction industry to reach net zero.

September sees the launch of a pilot version of the UK Net Zero Carbon Buildings Standard, which is the UK's first cross-industry standard and is designed to bring together net zero carbon requirements for all major building types, based on a 1.5°C trajectory.

The work to develop this involves leading organisations including BBP, BRE, the Carbon Trust, CIBSE, IStructE, LETI, RIBA, RICS, and UKGBC who have all have joined forces to champion this initiative.

One unified and agreed standard helps prevent businesses from merely paying lip service to environmental goals and will provide a clear, agreed-upon framework for construction companies to aim for.

The standard has learnt lessons from other standards across the globe, including NABERS, which originated in Australia, but which has been administered in the UK by CIBSE since April of this year.

Empowering the construction sector with existing technologies

The journey to net zero does not hinge on a futuristic 'silver bullet.' Technologies like heat pumps, which can make substantial progress, are already available. Heat pumps are highly efficient, transferring more energy than they consume, and can offer significant energy savings. They also reduce greenhouse gas emissions by using electricity instead of fossil fuels

and provide both heating and cooling, enhancing their versatility and year-round utility.

So, the focus should be on developing the knowledge and expertise needed to effectively integrate these technologies to retrofit buildings. However, the perceived high initial costs can be a barrier to the installation of these technologies. This mindset can hinder the adoption of energy-efficient solutions essential for achieving net zero targets. So, it's important to focus on long-term operational benefits rather than looking at short-term financial costs and focusing on direct capital expenditure.

One crucial aspect is prioritising operational expenditure (OPEX) over capital expenditure (CAPEX). OPEX refers to the ongoing costs of operating and maintaining a building, whereas CAPEX involves the initial costs of construction and major equipment. By focusing on OPEX, it is easier to see the total lifecycle cost of a building – and the savings that will be made – rather than just the initial budget. Investments in energy-efficient technologies and systems may have higher upfront costs but lead to significant savings and reduced environmental impact over time, contributing to long-term sustainability.

HVAC monitoring can reduce energy usage

HVAC monitoring is another strategy that can help to reduce energy use in commercial buildings. These systems work by collecting data on the energy consumed by HVAC equipment alongside other components such as temperature and humidity. In doing so, they continuously track and report on energy consumption and performance. This allows building owners and managers to identify and analyse areas of high energy usage and take steps to actively reduce them – whether by optimising existing equipment or upgrading to energy-efficient alternatives.

Modern energy monitoring platforms can also record the energy consumption of third-party equipment alongside HVAC equipment, allowing for a wider overview of energy usage in a building. This can then be displayed on an energy dashboard, allowing building owners and operators to monitor and compare the energy consumption of multiple buildings by ranking their usage by kW per hour per building size or by the number of temperature or consumption alerts.

Monitoring also allows operators to compare energy consumption between buildings, floors, rooms, and individual HVAC units – from room by room to entire estates. Using this data, the monitoring platform can help prevent single or multiple systems within a building from exceeding set temperature points, reducing energy wastage—for example, in a meeting room or shop floor where the heating or cooling has been left on overnight. Certain models can also limit units to cooling only in the summer and schedule these units to reduce or shut off operations during quieter periods or when unoccupied.

An increasing number of monitoring platforms also operate via the Internet of Things (IoT), meaning these systems can be operated and monitored remotely from mobile, PC, or Mac devices. This means building owners and managers can manage system performance anywhere globally.

Collaboration and support across the supply chain

It's important to remember that, even with all the technology available to retrofit buildings, achieving net zero remains a collective endeavour that requires collaboration across all levels of the supply chain. No single entity – a person, company, government, or country – has the 'answer' to the climate crisis. Public and private organisations must work together and share their knowledge and experience to effectively approach net zero targets.

Addressing the cost implications of net zero, especially during a cost-of-living crisis, is crucial. Commercial businesses need carbon-reducing options to be the most cost-effective if they are to be embraced, which is where changes in planning and regulations can help.

Larger companies are increasingly examining their supply chains to identify SMEs and understand what support they need to join the net zero journey. So, strategies must be inclusive, helping even the most resource-constrained clients, such as those facing significant retrofit challenges in existing buildings.

Through innovation, adaptation, and collective action, the construction industry can lead the way to a sustainable and net zero future. By integrating efficient technologies like heat pumps and leveraging advanced HVAC monitoring systems, building owners and managers can significantly reduce the carbon footprint of existing stock, making a lasting impact for future generations.

Optimising efficiency with evaporative cooling and VFD upgrades

Optimising energy efficiency in an HVAC system is crucial for reducing operational costs and achieving sustainability goals. Here, Ralph Davies, Head of Sales at Carrier HVAC Service UK&I, explores two upgrade solutions that can enhance HVAC technology performance, reduce running costs, and lower carbon emissions.

Things are heating up

Monday 22 July 2024 was the hottest recorded day on Earth, beating the record set just one day before. The Guardian also reported that at least 6 million lives are at risk from prolonged periods of very hot weather in England.

Global warming is a threat facing us all with hotter conditions becoming more common amid the climate breakdown. Here in the UK, we are somewhat under-equipped to effectively keep our buildings cool in hot weather.

It's thought that around 80% of the buildings we have today will still be in use in 2050 and an estimated 87% of the improved performance needed for the UK real estate sector to meet a 1.5°C aligned pathway must come from these buildings.

Fine tuning chillers equipped with VFDs

New buildings come with the benefit of being able to design and build HVAC systems into the fabric of the building, but what about our existing stock? It isn't so easy to replace old systems with new. Some plant rooms are not as easy to access, and then there is the capital expenditure. It is well documented that many public sector buildings struggle financially to find the necessary investment to install new and efficient cooling technology.

Energy efficiency in HVAC systems

Current energy consumption trends in commercial buildings highlight the urgent need for improved energy efficiency. Inefficient HVAC systems not only drive up operational costs but also contribute significantly to environmental degradation through higher CO_2 emissions. Through developing a service and maintenance strategy, using digital insights to review the existing equipment and systems, giving a baseline on the energy consumption and what system improvements could be made, businesses and building owners can expect to see improvements in energy efficiency, enhance indoor air quality, and reduce both costs and carbon footprints.

Establishing a baseline

Before implementing any upgrades, it is essential to conduct a thorough energy audit. Energy audits are a method for identifying inefficiencies in a building's HVAC system and help pinpoint areas where energy consumption can be optimised.

Large commercial properties in the UK are often subject to legislation around energy. So regardless of the desires to lower emissions, in order to comply with legislation like the Energy Savings Opportunity Scheme (ESOS) and the Streamlined Energy and Carbon Reporting (SECR) it is necessary for building owners to have efficient heating and cooling equipment to meet these requirements.

The first step of an energy audit involves gathering comprehensive data on the current energy consumption patterns, including historical usage and costs, system outputs, and real-time energy usage through sensors or meters. This data helps provide a clear picture of energy use within the building. From here, engineers can establish a performance baseline, serving as a reference for evaluating the HVAC system efficiency. This baseline helps identify typical energy demands

and periods of unusual usage, pointing to potential inefficiencies.

Next, benchmarks are set based on industry standards such as ISO 50002 or BS EN 16247, allowing engineers to compare the building's performance against best practices. A gap analysis follows, determining any discrepancies between current performance and benchmarks, pinpointing areas for improvement.

Finally, engineers recommend specific energy conservation measures, from simple fixes like recalibrating sensors and sealing leaks to more extensive upgrades such as evaporative cooling and variable frequency drives (VFDs), ensuring enhanced system performance and efficiency.

Enhancing chiller performance with evaporative cooling

Evaporative cooling is a technology-driven solution that cools the ambient air surrounding a chiller condenser. The system uses a high-pressure pump and specialised nozzles to enable a quick evaporative process in the surrounding air to reduce heat transfer. With a significantly reduced overall air temperature, the chiller's compressor requires less power to achieve optimal cooling effectiveness, improving overall performance.

With a controlled system in place, the technology's adaptability allows it to be switched on or off based on real-time weather conditions and chiller requirements.

Evaporative cooling is particularly effective with screw air-cooled chillers, as well as scroll air-cooled chillers. Real-world applications of evaporative cooling demonstrate significant energy savings and operational cost reductions. For instance, integrating evaporative cooling into an air-cooled chiller system has shown to reduce energy consumption.

Data from a 500kW air cooled centrifugal chiller with evaporative cooling indicates a 26kW saving in power consumption compared to the same chiller without the evaporative cooling. The saving is doubled, up to 52kW, compared to a screw compressor chiller.

Results have shown the power of the compressor is reduced, while the COP (Coefficient of Performance) of the air-cooled chiller increases by 4-8% after the intervention of the evaporative cooling system. The evaporative cooling system contributes to an electricity savings of approximately 14% p/a in air-cooled chiller systems.

Fine-tuning with VFDs

VFDs regulate motor speeds to match the load requirements of a chiller, significantly reducing energy consumption. By adjusting the motor's speed in response to the actual cooling demand, VFDs optimise energy use and extend the lifespan of the equipment by reducing mechanical stress.

VFDs can be seamlessly integrated into existing HVAC systems, providing immediate benefits. For example, during a recent project, Carrier fitted a VFD fan and upgraded controls on an AquaForce 30XA (400kW) unit. This chiller, which provided cooling for a large industrial application building, operated for 6,777 hours a year with a total annual consumption of 831,732 kWh. The client was paying 32p per kWh for electricity which totalled over a quarter of a million pounds per year.

Following the VFD upgrade, the client's energy consumption reduced to 805,568 kWh per year resulting in a significant saving on their electricity bill. Carbon emissions fell by 2,092 kg CO_2e per year, and the system's Energy Efficiency Ratio (EER) increased from 3.1 to 3.18. The client saw a return on their investment within two years.

On a larger scale, Carrier identified an opportunity to optimise and enhance the performance of six 19XR centrifugal chillers for a client in London. Carrier had supplied the chillers 20 years previously and were now revisiting the site to install VFDs and complete a full compressor refurbishment on the chillers.

The VFDs allow for precise adjustment of compressor speed to match the cooling demand, leading to more comfortable working environment for occupants and substantial energy savings, particularly during periods of low demand. On recent VFD upgrades in the field, engineers have observed energy saving circa 20% and reduced mechanical stress on the chillers' components, potentially adding a minimum of 10 years additional service life.

The changing landscape of service and maintenance

The way we approach service and maintenance is changing. Today, more than 750,000 medium-to-large-scale existing HVAC units require technology upgrades to meet efficiency and decarbonisation targets. By overlaying digital connectivity across the HVAC units, customers have easy access to live data at any time, custom alarm notifications, and reporting. Connectivity also allows engineers to remotely configure systems and provide corrective actions as and when required.

Ultimately, engineers are monitoring the system through insight-driven information to provide proactive trouble shooting and performance analysis, enhance equipment reliability and performance, all while reducing service costs.

Evaporative cooling and VFDs upgrades can be two effective improvements for commercial chillers. Upgrading parts rather than replacing entire units can also be more cost-effective, and in some case, the capital costs can be managed through strategic planning and phased implementation.

At Carrier, we adopt a holistic approach to managing the full asset life cycle of our clients' HVAC systems. From the installation and commissioning of new equipment, through regular service and maintenance solutions, to upgrades and modernisation, and finally to end-of-life retrofit, we can help clients create healthier spaces for occupants, reduce energy consumption, and lower their CO_2 emissions.

For more information about Carrier's service and aftermarket solutions, visit **www.carrier.com/commercial/en/uk**

VFDs were added to a client's six 19XR centrifugal chillers originally installed 20 years ago

Evaporative cooling: better for business and energy bills

How can UK businesses effectively tackle the challenge of cooling commercial and industrial buildings? Mark Fishwick, Director of Manchester-based Inergy Group, explores one option.

In recent years, spiralling energy costs have put pressure on businesses looking for new and innovative ways to achieve the same result with less capital outlay and less maintenance.

New system installs have been put on hold and maintenance schedules squeezed, leaving many businesses with the challenge of managing ageing HVAC assets and deciding when and where to invest. Systems without regular maintenance can experience unpredictable downtime and parts availability is not always guaranteed.

While researching for my business, I came across Evaporative Cooling. An alternative cooling method that not only offers higher energy efficiency than traditional HVAC solutions but also has cheaper running costs. Since then, it's been our mission to develop and use this technology to tackle the cooling challenges in industrial processes.

Cooling challenges in industrial processes

With regard to cooling, many industrial processes have a high heat-gain, whereby the process itself generates heat which must be managed. There are numerous sectors where this is occurring, two prime examples from our customer experience are industrial scale bakeries and plastic moulding facilities.

In an industrial-scale bakery using modern production methods the production line may be operational 24 hours a day, 7 days a week. A constant production of heat and steam from large ovens working to high temperatures must be managed carefully especially given the health and safety requirements for food production areas.

Plastic moulding facilities manufacture a variety of end products from everyday items such as plastic bottles for household goods to more specialist storage and packaging products. In a plastic moulding facility heat is used to mould the liquid plastic, but chemical particles may also need extraction to maintain a safe working environment.

Production in any of these facilities can be adversely affected by the heat-gain in the process itself. Unplanned and unmanaged heat in any manufacturing facility can stop production resulting in a cascade of business interruption, lost revenues, damaged stock and missed productivity targets. All potentially severe impacts for any business to consider.

In addition to heat-gain from the industrial processes we should also note that UK air temperatures are rising; the top 10 warmest years for the UK since records began in 1884 have all occurred since 2002[1]. As the UK continues to experience temperature rises and more seasonal fluctuations we need to look to those more experienced with warmer climates to optimise and improve our own approach to cooling these spaces.

Cooling a large industrial facility

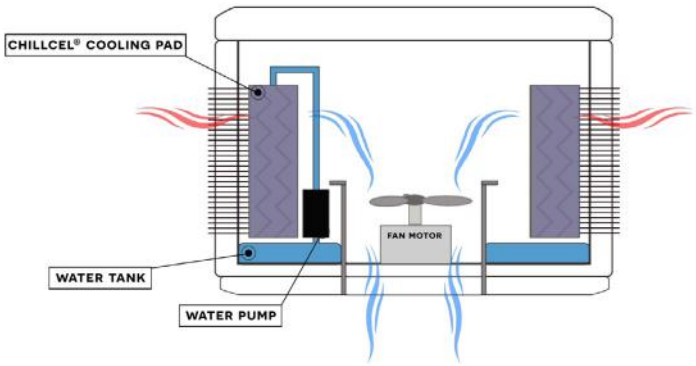
Let's consider options for cooling large commercial and industrial spaces. Most of us will be familiar with conventional air conditioning (AC) systems which remove both heat and moisture from the air using a chemical refrigerant. Cooled air is then re-circulated through the building and filtered as it returns to the unit.

Here are the key facts for conventional air conditioning:

- Temperature can be accurately controlled.
- Air is mostly recirculated within the space or building.
- The energy performance of the system is negatively impacted by high external temperatures i.e. The hotter the temperature outside the more energy is needed to maintain the desired temperature.
- Complete systems are expensive to install and maintain due to the more complex requirement associated to the refrigerants used within the units.
- The cost to run large systems is expensive resulting in high and unpredictable energy bills.
- Chemical refrigerants are used, ultimately negatively contributing to climate change.

Conventional AC isn't a bad choice but, in our experience, it better suits smaller spaces. Given the challenges around high heat-gain in many industrial processes, conventional AC systems are often working at capacity to deliver the cooling levels needed in the space. This high demand therefore results in high-energy use which leads to rising energy bills.

A fantastic sustainable alternative to conventional AC is evaporative cooling. Historically championed in warmer climates, the technology delivers several benefits over and above conventional and familiar air conditioning.



Fresh, filtered air enters the system and is pulled though a water-soaked cooling pad where the heat is absorbed, lowering the air temperature. Cooled air is distributed through the space via a fan and a series of ducts

What is evaporative cooling?

Evaporative cooling (EC) systems, as the name suggests, use evaporation to cool the air. Surprisingly, no chemical refrigerants are needed for this process. Fresh, filtered air enters the system and is pulled though a water-soaked cooling pad where the heat is absorbed, lowering the air temperature. Cooled air is distributed through the space via a fan and a series of ducts.

Advancements in evaporative cooling technology represent a significant innovation in sustainable cooling. These systems provide efficient cooling while maintaining a comfortable humidity level.

Here are the key facts of evaporative cooling:

- Temperature and humidity can be accurately controlled.
- Indoor air quality (IAQ) is improved through the introduction of 100% fresh outside air this in turn improves employee comfort, health and wellbeing and supports good productivity.
- Cooling performance is further improved with increasing external temperatures – efficiency rises along with the temperatures.
- Initial capital outlay costs are relatively low, in comparison to a like-for-like conventional air conditioning system.
- Running costs are low, lowering energy bills and energy dependence. .

Using only water to cool, combined with the lack of chemical refrigerant make evaporative cooling a responsible, energy efficient and sustainable choice for cooling your industrial or commercial workplace.

Lowering carbon footprint with evaporative cooling

When measuring a carbon footprint, you look at the amount of carbon dioxide directly or indirectly produced by your business. If an industry appliance uses a low level of electricity, it minimises the environmental impact[2].

Evaporative cooling systems contribute to lowering the carbon footprint of your premises in two main ways:

1. Evaporative cooling systems use up to 82% less energy[3] versus conventional air conditioning. This is a huge saving lasting for a lifespan of more than 15 years.
2. Evaporative coolers consume up to 30% less water than conventional AC systems despite relying on water to provide the evaporation for the cooling effect.

Addressing industrial hotspots

Industrial manufacturing workplaces often have hot spots that are uncomfortable to work in and those spaces are not just hotter than the rest of the building, but hotter than external ambient conditions. Evaporative cooling can be used to "spot cool" these hot spots, reducing the need for multiple units to cool the entire space.

Evaporative cooling is a proven technology perfect for all kinds of HVAC applications across multiple industries, including manufacturing plants and commercial warehouses.

When cooling large areas, evaporative cooling is more cost-effective than traditional air conditioning.

Not only is the initial capital outlay to design and install the system lower than conventional air conditioning, day-to-day running costs are lower due to the reduced energy demand from the sophisticated technology used in these coolers.

These cost savings are underpinned by the eco-friendliness of the technology. This can be further enhanced with supportive clean energy solutions like solar power.

www.inergygroup.co.uk/

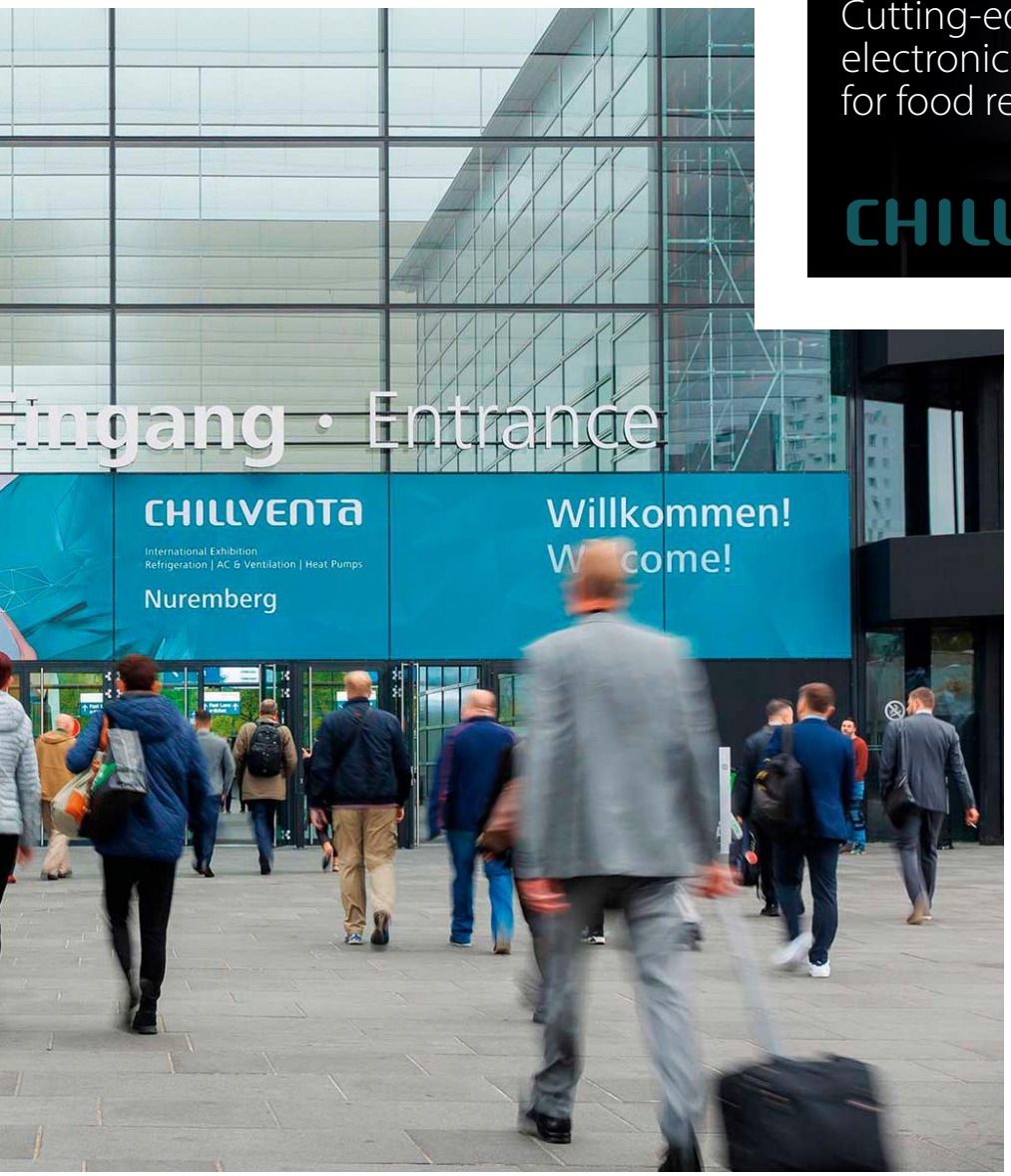
Evaporate Cooling	Air Conditioning
✓ Energy efficient	✓ Precise temperature control
✓ Low running costs	✗ Respiratory health risks
✓ Simple maintenance	✗ Complex maintenance
✓ Runs on water	✗ High initial & running costs
✓ No refrigerants	✗ Uses harmful refrigerants
✓ Less roof space required	✗ Requires considerable roof space
✓ Lower weight units	✗ Heavy units

References:

1. **https://www.metoffice.gov.uk/research/climate/understanding-climate/uk-and-global-extreme-events-heatwaves**
2. The Nature Conservancy – Calculate Your Carbon Footprint
3. The running costs comparison is a calculation based on assumptions including: Building dimensions 1000m² floor area x 6m high; Cooling time 12hrs/day, 6 summer months/year; Indoor temperature 22°C; Building heat load 100W/m²; Rooftop Unit – Fresh air 1,170 l/sec (20%); Rooftop Unit -COP 3; External ambient conditions based on Typical Meteorological Years (TMY) for Madrid (Spain); Power cost 0.11 €/kWh; Water cost 1.5 €/m³; Electricity Generation CO_2 equivalent 340gCO2eq/kWh. The comparison should be used as a general guide only.

Making the most of your Chillventa visit

Chillventa 2024 is ready to welcome thousands of visitors and organisers have highlighted a range of services and tools available to help guests make the most of the event.



The leading international trade fair for refrigeration, air conditioning, ventilation and heat pumps will take place from 8-10 October 2024. Thousands of visitors from around the world are expected at Exhibition Centre Nuremberg, where around 1,000 international exhibitors will showcase their latest innovations in eight exhibition halls. The event

At the Chillventa CONGRESS, which starts on 7 October, participants can look forward to in-depth presentations and discussions on the current challenges and future trends in the sector.

Organisers say the Chillventa website (**www.chillventa.de/en**) is the ideal starting point, offering travel information and hotel booking deals and well as a comprehensive overview of exhibitors, products and this year's supporting programme.

Getting there

Thanks to its central location and excellent transport connections, NürnbergMesse is easy to reach. Albrecht Dürer Airport offers fast connections and short distances straight to the exhibition centre. Nuremberg Central Station is a hub for national and international rail transport and offers a direct underground rail connection to the exhibition centre that takes just 8 minutes. Easy access to several motorways also make it easy to travel to the event by car. For more information, visit **https://www.chillventa.de/en/all-about-the-exhibition/travel**

Hotel bookings

Just in case you've left it until the last minute, the booking system developed especially for the needs of exhibition customers offers a selection of partner hotels in Nuremberg and the metropolitan region in the two to five-star segment. Registration is free, and exhibition participants can then benefit from an up-to-date online room booking system, an overview of recent bookings, pre-filled company details to speed up the booking process, and special booking conditions. For more information, visit **https://www.chillventa.de/en/all-about-the-exhibition/travel**

Plan your visit

To avoid wasting time on site, trade fair visitors can view the exhibitor and product database ahead of the event. Targeted searches by keyword and filter options such as type of company, country of origin and new products enable efficient planning of the trade fair visit. As well as a description of the company and information on the products on display, the exhibitor profile also provides contact details to allow meetings to arranged in advance. For more information, visit **https://www.chillventa.de/en/exhibitors-products**. Detailed floor plans can be downloaded at **https://www.chillventa.de/en/exhibit/plan-your-stand/floor-plan**

Buy tickets and redeem vouchers

Day tickets for €30, unlimited entry for €45, CONGRESS tickets and other special tickets are only available online in advance from the Ticket Shop. Vouchers can also be redeemed in the Ticket Shop. For more information, visit **https://www.chillventa.de/en/visit**

ACR Journal at Chillventa

ACR Journal Editor Andrew Slater and Sales Manager Victoria Brown will be in Nuremberg. Email **victoria.brown@warnersgroup.co.uk** if you would like to get in touch during the event.

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Visit www.acrjournal.uk/information/national-acr-heat-pump-awards or email Hayley Comey on hayleyc@warnersgroup.co.uk to find out more

ALAN DUNNE, MANAGING DIRECTOR, AGGREKO

Aggreko has appointed ***Alan Dunne*** as Managing Director for the UK and Ireland as it looks to strengthen its provision of energy transition solutions.

Alan Dunne, Managing Director, Aggreko

Bringing 30 years of commercial experience to the role, Dunne first joined Aggreko in 2014 working in both operational and commercial leadership roles across Europe and North America. Having gained knowledge and experience across the business and through working closely with customers, he is set to develop strategic partnerships with customers in the region to provide suitable flexible energy solutions.

Dunne said: "I am excited to bring my commercial experience to drive Aggreko's growth strategy. With further investments planned, this is an exciting time for Aggreko and I am delighted to lead our continued innovation across sectors in the UK and Ireland."

Robert Wells, Europe President at Aggreko said: "We are committed to supporting our customers make their energy transition a success. We also understand that there are different challenges, regulations and variables that can impact achieving this in different parts of the continent. By appointing Alan as a dedicated Managing Director for the UK and Ireland, we can ensure we are working closely with customers there to find the right solutions for their needs."

https://www.aggreko.com/en-gb

DAVID CHISNALL, AREA SALES MANAGER, CONDAIR

Humidity control and evaporative cooling specialist Condair has appointed ***David Chisnall*** as its new Area Sales Manager for the north of England. He joins with over 25 years' experience in the HVAC sector, having worked in air filtration and AHU manufacturing sectors.

David Chisnall, Area Sales Manager, Condair

Dave Marshall-George, Condair's UK & Ireland Sales Director, said: "It's great to have David join the team. He brings a wealth of experience with him, and I'm delighted that he's now representing Condair in this important sales area covering Yorkshire, Lancashire, Cheshire and some of the surrounding areas."

Chisnall commented: "I'm greatly looking forward to getting to know Condair's customers and supporting them with their humidity control needs. I'm very happy to be joining the market-leader in the humidity control sector. It's amazing how many different industries Condair works across, for both humidification and dehumidification, and I'm keen to start engaging with our partners across contractors, consultants, OEMs and end-user clients."

The Condair Group is represented in the UK by Condair Ltd, which offers system design, manufacture, supply, installation, commissioning, maintenance and spares.

www.condair.co.uk

SIMON ALLAN, CEO, HAWCO

Air conditioning and refrigeration component supplier Hawco has appointed Simon Allan as its new CEO and a member of the executive board, succeeding Martin Butler, who leaves the business after 25 years.

Simon Allan, CEO, Hawco

Allan has held a series of senior management positions in distribution businesses, most recently as Country Manager responsible for the UK & Ireland division of ADI Global. He previously worked for Armstrong Fluid Technology and Wolseley, including time as Commercial Director for the cooling business under the Climate Centre brand.

Hawco Chairman Duncan Wilkes said: "We are delighted that Simon is joining us to lead the business as it builds on the foundations that Martin has put in place over several years. He brings huge experience in leading distribution businesses and growing revenue."

Allan said: "This is a great time to be joining Hawco. We are well positioned for growth with a very experienced team, a strong product range, the ability to provide our customers with effective technical guidance and ambitious owners."

https://www.hawco.co.uk/

GLENN PRICE, APPLIED SPECIALIST, FUJITSU

Glenn Price has joined Fujitsu General Air Conditioning UK as an Applied Specialist. He will look to support and develop the company's offering across chillers, heat pumps and close control systems.

Glenn Price, Applied Specialist, Fujitsu

Following an electrical apprenticeship, Price has since spent more than 13 years in the air conditioning industry, covering installation, breakdowns and maintenance before extending his knowledge base to include chillers, heat pumps and ventilation.

He joins Fujitsu from wholesaler TF Solutions where he was most recently a heat pump technical manager, having previously spent time in air conditioning technical support.

Price said: "Fujitsu is highly regarded in the industry; the company's customer-focussed approach really resonates with me. I'm here to help develop and push Fujitsu's applied offering to the next level by giving internal staff and customers the support they need."

Martyn Ives, Commercial Director at Fujitsu General Air Conditioning UK, said: "We have a strong applied line-up with more exciting developments to come, so we are delighted to welcome Glenn to the team. I'm sure his technical knowledge will prove invaluable, both to our customers and his colleagues."

https://www.fujitsu-general.com/uk/

MARTIN SMITH, BUSINESS UNIT DIRECTOR, CONEX BÄNNINGER

Martin Smith, Business Unit Director, Conex Bänninger

Martin Smith has been appointed Business Unit Director – UK & Ireland by Conex Bänninger, the global manufacturer of fittings, valves and accessories.

Smith has joined from Triflow, another company within the IBP Group, where he held the position of National Sales Manager. His other industry experience includes leadership roles with Ideal Stelrad Group, Wolseley and Triton Showers.

He said: "Throughout my career, I've been involved in sales development for key brands, establishing demand at the merchant trade counter, and I'm looking forward to continuing in that vein.

"Creating an environment that encourages more plumbing, heating, air conditioning and refrigeration installers to move towards press fitting will be a key part of our team strategy moving forward. There are numerous technical, safety and financial benefits associated with investing in press and we'll be doing all we can to illustrate those."

www.conexbanninger.com

STEVE BOOTON, OCEANIA REPRESENTATIVE, ORGANIC HEAT EXCHAGERS

Steve Booton, Oceania Representative, Organic Heat Exchagers

Cold thermal energy specialist Organic Heat Exchangers (O-Hx) has appointed ***Steve Booton*** as its Oceania representative, extending the global reach of the business and its patented energy storage solution, EnergiVault.

Based in Australia and with 30 years of environmental experience in the distribution, manufacturing and e-commerce industries, Booton will be responsible for developing routes to market and investment opportunities for EnergiVault in Oceania.

He said: "The requirement for cooling resilience in warmer climates is very apparent, and I'm looking forward to working with a product that can provide that in abundance. The limited power supply in some locations means a lack of cooling capacity limits industries. EnergiVault will unlock this issue with its ability to charge from renewable sources and through the low operating current off-peak charging."

Bob Long, Executive Chairman and Founder of O-Hx, said: "Hotter industrialised countries such as Australia present prime opportunities for us, so we are delighted to have someone like Steve onboard. He is renowned as a resilient, communicative leader and has developed a reputation for delivering in competitive markets. He will be key in developing business in Oceania."

https://o-hx.com/

WOMEN IN THE ACR INDUSTRY

Emmie Fletcher is a Sales Administrator at Green Point UK.

What was your first job?

I started off working at a small independent soft-play centre, running parties, preparing food and serving drinks. I was also responsible for managing health and safety and organising the play area.

What does your current role involve?

At Green Point UK, my role involves a wide range of administration and co-ordination activities, including communication with new, existing and potential customers requiring remanufactured BITZER compressors. I look after quotations and orders and respond to customer queries.

On the logistics side, I also oversee booking-in failed compressors when they come in to replenish our stock. Finally, I am also responsible for some of Green Point UK's marketing, to help raise our profile and create awareness of the business on LinkedIn.

What attracted you to the industry?

Having only worked in retail before, I wanted to try something new to develop my skills and expand my experience of business generally. Refrigeration struck me as an unusual and interesting industry, and I decided to get involved. I suspected there would be a lot to learn, and this has proved to be correct! I was also keen to use my sales and people skills in a more front-line role in an ever-growing industry.

What excites/interests you about the industry?

It soon became clear after joining that the industry is constantly evolving, with new products, technologies and approaches being developed. It is fascinating to see how the sector is rising to the many challenges and opportunities it faces.

Emmie Fletcher

I also like being involved in refrigeration and air conditioning as the sector touches so many aspects of modern life – at home, work and play, and is really one of the unsung heroes essential to civilised life. With the growing use of heat pumps, this adds another dimension that will increase the importance of high quality compressors in the years ahead.

Emmie is keen to continue deepening her product and technology knowledge

How would you like to see your career developing?

I would like to continue developing my skills in sales and gain a deeper knowledge of our products and the underlying technology. I am also interested in potentially progressing into on-the-road sales, visiting customers to update them on what we do, and helping to generate more business that way.

What is the best piece of advice you were ever given?

You are more capable than you realise, never be afraid to ask questions, and push yourself!

What do you see as the challenges facing the industry?

Environmental protection is obviously a key issue. We are playing our part at Green Point UK by helping to complete the circular economy, by remanufacturing compressors and returning them as good-as-new into service.

Demand for cooling and heating is growing, and the emergence of heat pumps is adding to this. There is a need to gear up to meet this to ensure requirements – nationally as well as locally – are met in a timely manner.

This is obviously good for the industry, but there may be some growing pains along the way.

Emmie manages a variety of administration tasks, customer liaison, and business marketing

What would you say to other women who are considering coming into the ACR industry?

Don't let anything hold you back. It is an interesting and fast-paced industry to work in with constant demand. There are many career opportunities, such as engineering and technical roles, administration, sales, promotion – and many more.

Is there a little-known fact about yourself that would surprise other people (secret skill, unusual hobby etc)?

I am a Brown Owl and run my own Brownie unit. When much younger, I used to be a competing gymnast.

I am also a massive animal lover and once had 27 guinea pigs, two cats and a hamster – all at the same time!

Emmie pictured in front of a section of Green Point UK's extensive stock of BITZER compressors ready for remanufacturing

The Innovation Zone

The guide to what's new for ACR Journal readers, offering vital industry news.

To advertise your product in 'The Innovation Zone' section please contact **victoria.brown@warnersgroup.co.uk**

HITACHI INTRODUCES AIR365 MAX TOP-FLOW VRF

Johnson Controls-Hitachi Air Conditioning Europe has announced the launch of air365 Max, a new top-flow variable refrigerant flow (VRF) air conditioning system.

The air365 Max series comes as standard with both heat pump and heat recovery built in, and is available in two models: the standard air365 Max and the high energy efficient air365 Max Pro. Both models are compatible with more than 64 Set Free indoor units.

SmoothDrive 2.0

Featuring Hitachi's SmoothDrive 2.0 technology, the air365 Max and air365 Max Pro produce a Seasonal Energy Efficiency Ratio (SEER) of up to 7.35 and 8.38 as well as a Seasonal Coefficient of Performance (SCOP) of up to 4.76 and 5.19 respectively.

This energy efficiency performance is made possible by superior control of the compressor speed and indoor unit expansion valves while other models in the market use the refrigerant evaporation temperature as an intermediate leverage on the thermal output.

SmoothDrive 2.0 enables air365 Max to operate at stable and precise temperatures that provides greater comfort for building occupants. When combined with other smart features such as Gentle Cool and Warm Feet, air365 Max addresses the issue of cold or hot air drafts and further improves user comfort levels.

airCloud Tap

The airCloud Tap is a new generation app launched in 2023 to help HVAC professionals install, read and change Hitachi equipment settings with ease on their smartphones and mobile devices. With the app, installers will have access to more than 200 setting parameters (ranging from basic to advanced) that will support them in optimising the equipment functions and operations.

To maximise the operation of air365 Max, JCH offers additional solutions including:

- **CSNET Manager:** an advanced central controller that monitors and controls up to 1,024 VRF indoor units, it allows local or remote control of all the installed units with the CSNET Manager Web App on a laptop, smartphone, or tablet.
- **Advanced colour wired remote controller:** an intuitive wall controller with improved scheduling options to sync the equipment operations with the building's business hours. It also displays the indoor unit's energy consumption.
- airCloud Pro: a cloud-based centralised controller that enables HVAC professionals and building managers to monitor and control the VRF system on the smartphone.

https://www.hitachiaircon.com/uk/

CLIVET ROLLS OUT THUNDER HEAT PUMP ON R290

Clivet has launched Thunder, a new energy-efficient air-cooled reversible heat pump with natural refrigerant R290 (propane).

Thunder is an innovative solution since it is designed with full-inverter technology on latest-generation scroll compressors and axial fans.

It offers maximum energy efficiency and thanks to the use of R-290, a natural and ecological refrigerant (GWP = 3) that can be used in the long term as it is fully compliant with the European regulation on fluorinated F-Gas (517/2014), it contributes to the reduction of the direct and indirect greenhouse effect.

Thunder is available in the 40-85kW capacity range and is characterised by high performances, application versatility and extended operating limits.

With a seasonal efficiency in heating SCOP (W55) up to 3.63, the unit guarantees heating, cooling and domestic hot water production up to 75°C and an operating range in heating from -20°C to +42°C ambient air.

https://www.clivet.com/en/home

CONDAIR UPDATES RS STEAM HUMIDIFIER

Condair is introducing an updated version of its steam humidifier, the Condair RS. As well as a new outer case design, the resistive steam humidifier has the latest technology that allows remote monitoring and troubleshooting by the manufacturer.

A new touchscreen interface operates like a smartphone, to navigate with scroll, slide and press functionality. The controller also offers historic performance and settings reporting, service history, error reporting and an Excel-based download to USB function.

A removable tank sits underneath the boiling chamber, collecting scale as it detaches from the heating elements during normal operation. Maintenance staff can routinely drain the system and empty the scale without opening the main unit housing.

Other features include a "cold-water pool" that prevents any blockages around the water inlet or drain outlet. The boiling chamber has a twin-wall design with the water inlet and drain outlet being situated in an area between these walls.

Small single cylinder units start with a maximum output of 5kg/h, with double-cylinder models and master/slave configurations offering up to 160kg/h. Steam humidification can be delivered to a duct via a steam lance, as well as directly to a room with a top-mounted or remotely located blower pack.

www.condair.co.uk

FUJITSU ADDS AIRSTAGE J-VS MINI VRF ON R32

Fujitsu has launched the latest version of its award-winning J-Series heat pump mini VRF system, now operating on lower-GWP R32 refrigerant and delivering significant improvements in efficiency.

The AIRSTAGE J-VS is the result of two decades of development and multiple upgrades as this year marks the 20th anniversary of the product affectionately dubbed "Little Napoleon".

Aimed at small to medium-sized commercial applications or large residential spaces, the J-VS is available in capacities from 12-15kW. The compact, single-fan chassis has a volume of just 0.3m^3 (17% less than previous model) and a weight of only 74kg, aiding installation in tight spaces.

Up to 13 indoor units can be connected from a new range including compact 4-way cassettes, low static slim ducted and high efficiency ducted units, alongside wall-mounted options. This line-up includes additional 1.7kW models and, due to heat exchanger optimisation, a new 1.1kW slim ducted unit.

Compressor innovation improves seasonal efficiencies up to a possible 8.27 SEER (up to 36% increase from previous model) and 5.37 SCOP (up to 33% increase from previous model).

Martyn Ives, Commercial Director at Fujitsu, said: "The J-Series has proved itself over two decades and continuous improvements have maintained its position as a leader in its class. This latest upgrade, together with the new compatible indoor units, will ensure that it remains a strong proposition for a wide range of commercial projects."

The system meets environmental safety standards specified in IEC 603352-40 for the use of R32 refrigerant. Newly designed components include safety shut-off valves and leak detection sensors, which aid application when the design is deemed to be above the concentration limits of R32 in the event of a refrigerant leak. In addition, the refrigerant charge of the J-VS is 32% less than the previous model.

A new compressor featuring improved compact windings and a larger displacement means that rotational speeds can be reduced without a decrease in equivalent performance. Compressor control technology has also extended the minimum operating speed of the compressor to 15rps, managing low load conditions more efficiently and effectively than previous versions.

Integrated refrigerant storage devices, which prevent liquid slugging to the compressor during low load conditions, allow for up to 120m of liquid refrigerant pipe, with a longest length of 50m and a 30m elevation between indoor and outdoor units. An elevation difference of 15m is possible between indoor units.

Redesigned cooling channels and suction line inverter PCB cooling allows the unit to be placed in higher temperature locations without the risk of electrical damage caused by overheating. This enables the installer to take advantage of the fan's 30Pa external static pressure capability, allowing installation in restricted locations using discharge air ducting.

https://www.fujitsu-general.com/uk/

ADVANSOR UNVEILS NEW ENCLOSURES

Advansor is introducing new enclosures designed to provide a flexible placement and fast installation of cooling and heating solutions outdoors.

The new enclosures make it possible to place the whole climate solution on a roof, parking lot or backyard. The rack is mounted in the enclosure from factory saving installation time on-site.

CEO Kristian Breitenbauch said: "Lack of skilled workers on-site is one of the limitations to speed up the green transition. With the rack mounted in an enclosure from factory our customers get one delivery, one point of contact, and warranty on the entire solution, reducing the risk of errors and ensuring a seamless and fast installation on-site."

Advansor also recommends including the gas cooler in the delivery to make sure everything is calculated for optimal performance and guarantee.

According to Advansor, the enclosures have a robust design with solid welded steel base frames, fixed roof for weather protection and active cooling inside.

Active cooling makes is possible to avoid noisy fans and the whole solution is based on natural refrigerant CO_2. The active cooling makes it perfect for placement in warm climates as the temperature is kept below 35°C, ensuring long lifetime of components.

https://www.advansor.com/product/enclosures

SWEGON LAUNCHES TRION SABER UV KITCHEN AIR CLEANER

Swegon has launched the TRION Saber UV kitchen air cleaner, designed to reduce odours and provide a fresh and clean environment for commercial kitchens.

With a lifespan of up to 12,000 hours and designed for hotel restaurants, food courts and commercial building kitchens, the air purification system uses quartz UV lamps with nano-scale coatings and advanced filament technology to ensure optimal UV output and effectively deodorise.

It comes equipped with an intuitive control display that features operating and fault indicators, providing real-time status updates for smooth operation.

Alongside this, the lightbox module's interlocking design allows for easy extraction and insertion, ensuring a secure connection between light boxes for smooth operation. It also includes a safety switch for power failure protection and a manual power switch for maintenance.

www.swegon.com/UK

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