

# THE ACR JOURNAL

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Essential Information for the Air Conditioning and Refrigeration Industry

## ACR & HEAT PUMP REGIONAL EXHIBITION

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**Welcome to the April/May edition of ACR Journal.**

This edition brings us a focus on Indoor Air Quality (IAQ). Emma-Louise Bennett from Clivet UK looks at why IAQ must be at the forefront of modern ventilation design. Read more on why the BESA global IAQ ledge marks a pivotal movement of the industry by turning to page 12.

Gary Nicholls, co-author of BESA TR19<sup>®</sup> AIR, also explores the shift from reactive to predictive maintenance. This issue also brings us the highly coveted shortlist of the ACR & Heat Pumps Awards for 2026. This enviable awards dinner is held at the Midland Hotel, Manchester on the 11th of June.

Book your places by visiting [www.acrjournal.uk/national-acr-heat-pump-awards](http://www.acrjournal.uk/national-acr-heat-pump-awards)



I hope you enjoy this edition and look forward to seeing many of you at the FETA Lunch on the 16th of April, and ACR & Heat Pump Awards in June.

*Juliet*

**Juliet Loiselle FinstR**, Editor/Publisher



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**REGULARS**

- 05. News**  
Key industry updates
- 05. Changing Faces**
- 11. Tools Talk – DiversiTech**
- 28. Women in the ACR Industry**  
Giulia Kapp
- 30. The Innovation Zone**  
The latest products and launches

**FEATURES**

- 09. Why indoor air quality (IAQ) must be at the forefront of modern ventilation design**
- 12. BESA's pledge: How defining a practical "Step One" could turn awareness and intent into meaningful action**
- 14. Exploring the shift from reactive to predictive maintenance and how FMs and contractors can ensure compliance**
- 16. How lifecycle refrigerant management works and can support industry transition and development**
- 20. Keeping data centre energy usage in check**
- 22. Why thermal insulation should not be an afterthought and how industry collaboration can make a difference**
- 25. Training to fill the skills gap**
- 26. Cirencester College: A clear commitment to the green economy**



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**BCIA ANNOUNCES NEW PRESIDENT AND VICE PRESIDENT**

The Building Controls Industry Association (BCIA) has announced that **Jen Vickers** has been appointed as its new President, with **Ron Purcell** taking on the role of Vice President.

Jen succeeds **Stacey Lucas**, who has served as BCIA President for the past two years. Jen has worked for Crown House Technologies, part of Laing O'Rourke, since 2015 and brings significant industry experience to the role. She has served as BCIA Vice President for the past two years.

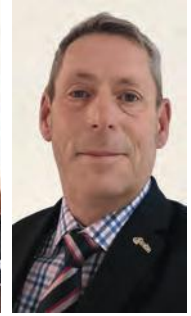
Jen will work closely with new BCIA Vice President Ron as the Association continues to champion the role of building controls across the built environment.

Together, they will work closely with the BCIA Management Committee and wider membership as the Association continues to champion the role of building controls in delivering safer, more efficient and more sustainable buildings.

[bcia.co.uk](http://bcia.co.uk)



**Jen Vickers -  
President BCIA**



**Ron Purcell, Vice  
President of BCIA**

**MAJED DAIYOUB JOINS CONDAIR AS AREA SALES MANAGER**

Condair has appointed **Majed Daiyoub** as its Area Sales Manager for the north of England and North Wales. Majed joins Condair with a wealth of HVAC experience having worked at Carrier HVAC and Air Handlers Northern.

Majed commented: "I'm really looking forward to getting to know Condair's existing clients and helping new potential customers get to grips with their humidity control issues."

[www.condair.co.uk](http://www.condair.co.uk)



**Majed Daiyoub, Area  
Sales Manager for  
the north of England  
and North Wales  
at Condair**

**IOR ANNOUNCES CO-CHAIRS OF NEW INDUSTRY SKILLS ALLIANCE**

The Institute of Refrigeration (IOR) has announced a major step forward in the development of its new Industry Skills Alliance, confirming that **Andrew Bowden FInstR** and **Mark Harris MInstR** have been appointed as Co-Chairs.

Andrew and Mark's appointment mark a significant milestone in the IOR's work to bring industry and training partners together to address long term skills challenges across the refrigeration, air conditioning and heat pump sector.

<https://tinyurl.com/2vef5e3h>

**BESA updates HIU test standard for better performance**

The Building Engineering Services Association (BESA) has announced an important update to its UK Heat Interface Unit (HIU) Test Standard, further strengthening performance benchmarks and supporting the sector's readiness for incoming heat network regulation.

Version 3.1 of the BESA HIU Test Standard builds on the success of previous editions, which have made a positive contribution to the consumer experience, improving the services of residential heat networks, and reducing carbon emission. The V3.1 standard represents another step forward for HIU performance across the sector.

The changes are aligned with BESA's core mission to improve the performance of residential HIUs and come at a critical time as the industry prepares for the introduction of the Heat Network Technical Assurance Scheme (HNTAS), which is expected to require HIUs to meet the BESA HIU Test Regime or an equivalent standard.

To read the story in full visit:

[www.acrjournal.uk/news/besa-updates-hiu-test-standard-for-better-performance/](http://www.acrjournal.uk/news/besa-updates-hiu-test-standard-for-better-performance/)

**P & M strengthens Northern presence with HBCL acquisition**

The P & M Group has announced the acquisition of Bradford-based HBCL Coldstores, marking a significant strengthening of the company's presence in the North of England.

The acquisition of HBCL is part of continued and rapid growth at the cold chain solutions specialist P & M, whose major constituent part is cold store expert ISD Solutions.

Group turnover has increased significantly from £58 million in 2024/25 to £88 million in 2025/26.

This upward trajectory is expected to continue as the group executes its long-term expansion strategy, mixing organic growth with strategic acquisitions.

The UK cold chain sector is experiencing robust growth, with the logistics market valued at approximately £11.5 billion and projected to grow rapidly in coming years.

Growth is driven by increased e-commerce demand, pharmaceutical logistics and food sector requirements, with the market shifting toward automated, sustainable, and energy-efficient facilities.

Until now operating predominantly in the retail sector, HBCL will retain its branding presence and its 27 staff, while offering the considerable expertise, resources, customer base and supplier network that P & M has to offer.

To read the story in full visit: [www.acrjournal.uk/news/p-m-strengthens-northern-presence-with-hbcl-acquisition/](http://www.acrjournal.uk/news/p-m-strengthens-northern-presence-with-hbcl-acquisition/)



## RACES – delivering the change the industry wants

**Graeme Fox CEng**, Technical Director at Refrigeration and Air Conditioning Engineers Society (RACES), discusses how, although RACES may only be a few months old, it is already changing how the sector operates and supports its trainers.

RACES have teamed up to help distribute over 50 Air to Water heat pump units completely free of charge to our network of training centres and colleges – thanks to a kind donation by Dimplex.

A 4kW and a 6kW heat pump system are currently being arranged for delivery to each of our very grateful trainers around the country and we look forward to helping roll out training on these systems with our trainers in due course.

This support for the training sector is just a small part of what makes RACES unique: our approach is to represent the grass roots of the industry – the tens of thousands who have never felt represented despite being the heart of everything our sector is about. The passion and dedication being demonstrated by some of our volunteers has been breathtaking: Derbyshire Refrigeration coordinating some amazing monthly prizes – awarded by a random draw of our membership list every month; **Mark Denford** and **Dean Wheldale** coordinating our Training team and Technical teams respectively; **Lilly Richardson** pulling everything together; and our Managing Director **Michael Smart** getting out and proactively visiting sponsors and colleges alike – it's a new approach with several names not well known yet in the sector, but rapidly becoming the new faces of a new approach to serving the industry better and driving our sector forwards with meaningful impact.

With big sponsorship news to be announced in April alongside our current sponsors, RACES is already established and making waves.

### First in-person event

With our first in-person event already planned and rapidly approaching this also promises to change the way our sector works. Hosting an evening of technical talks and networking at Lincoln City FC on April 1st we have pulled together sponsors to give practical talks rather than usual sales slanted talks at industry events and have laid on food and drinks for registered attendees at this free to attend event. There are still some free places left



**Graeme Fox CEng**, Technical Director at Refrigeration and Air Conditioning Engineers Society (RACES)

but you need to register at [www.races.org.uk/races-events-and-training-opportunities](http://www.races.org.uk/races-events-and-training-opportunities) to book your place.

Technical presentations from Yellow Jacket, Green Point, Logicool Air Conditioning, Daikin, DSU, and TF Solutions alongside The F-Gas Register and Derbyshire Refrigeration it really promises to be an exciting evening – and our plan is to repeat this type of event around the country to give all of our members the opportunity to attend an event, network, meet your peers, and learn from experts.

### Membership

With membership at only £65 plus VAT giving you free access to an incredible peer reviewed technical library and including technical and service manuals for dozens of manufacturers already, inclusion in the monthly prize draws, and access to subsidised or free training courses – the only question for those who haven't already joined is “why are you not supporting this revolution in our industry?”

Registration is free to apprentices – ask your college lecturer to get you registered.

RACES was formed because hundreds of RACHP engineers had complained for years that they “had no representation, nobody looking out for their interests” and we are setting out to deliver on that demand. The more engineers register with us, the better we can represent the sector meaningfully.

RACES was formed because hundreds of RACHP engineers had complained for years that they “had no representation, nobody looking out for their interests” and we are setting out to deliver on that demand. The more engineers register with us, the better we can represent the sector meaningfully.

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More Information: [www.races.org.uk](http://www.races.org.uk)

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# Designing for air quality, not just airflow

**Emma-Louise Bennett**, Sales Support Engineer at Clivet UK, discusses why indoor air quality (IAQ) must be at the forefront of modern ventilation design.

Indoor air quality (IAQ) has become one of the most prominent topics in building services, and rightly so. Increased awareness, tighter regulations and more energy-efficient buildings have all placed greater emphasis on how ventilation systems are designed, installed and maintained. Developments such as the introduction of Awaab's Law have brought the consequences of poor indoor environments into sharp focus, reinforcing the need to take ventilation design seriously from the outset rather than relying on remedial action later.

Having recently completed both domestic and commercial ventilation training myself, I have become much more aware of the complexities of ventilation design, particularly when trying to balance energy efficiency, comfort and IAQ. Even small compromises in design or installation can have a noticeable impact, especially in high-density or inner-city projects where natural ventilation options are limited.

This raises an important question for the industry: "Are we still designing ventilation systems to meet minimum requirements, or are we designing them to genuinely provide healthy indoor environments?"

## Designing for airflow vs designing for air quality

A topic I keep hearing in conversations across the industry is the difference between designing for airflow and designing for actual IAQ. Compliance has traditionally focused on achieving minimum ventilation rates, but it seems this does not always mean occupants experience healthy air once the building is in use.

Guidance such as BS 40102-1 is starting to move the focus towards measurable indoor environmental quality, encouraging monitoring and verification rather than

relying only on design calculations. Despite this, adoption still feels slow.

During recent CPD sessions delivered by **Mike Harrichand** of Sabiana, one of the key messages was that IAQ is still not always at the forefront of consultants' minds when ventilation systems are designed. Greater attention is often given to capacity, energy targets and space constraints, with air quality considered later in the process.

**Nathan Wood** of Farmwood Ltd has also highlighted the gap between UK air quality limits and World Health Organisation guidance, suggesting that buildings designed to current standards may still expose occupants to pollutant levels that are not ideal from a health perspective.

With more guidance now around sick vs healthy buildings, this issue is becoming harder to ignore.

## Urban environments and the growing IAQ challenge

The challenge becomes even greater in dense urban environments, where external air quality can be poor and natural ventilation is often not a realistic option. Pollutants such as PM<sub>2.5</sub>, nitrogen dioxide and volatile organic compounds are now widely recognised as key contributors to poor IAQ, particularly in cities where traffic and industrial activity increase background pollution levels.

Examples discussed during Sabiana's IAQ CPD showed that in heavily polluted environments outdoor PM<sub>2.5</sub> levels can exceed 100 µg/m<sup>3</sup>, meaning even ePM<sub>2.5</sub> 90% Efficiency Filters on AHUs may not be enough without careful system design.

This is especially true in high-density residential buildings. **Dave Clarke** of Clarke Talbot Renewables points out that in co-living environments, particularly in cities such as London, windows cannot always be relied upon for ventilation due to



**Emma-Louise Bennett**, Sales Support Engineer at Clivet UK

noise pollution. In these cases, mechanical ventilation with heat recovery becomes essential to maintain indoor air quality.

However, conventional MVHR systems alone may not always address comfort, humidity and cooling requirements, which is why there is increasing interest in more integrated solutions.

## From ventilation to IAQ systems

There is growing focus on filtration and monitoring alongside airflow. An area new to me, but which I have been learning more about is electrostatic filtration, which is starting to appear more often in discussions around IAQ.

Unlike traditional mechanical filters, electrostatic systems charge airborne particles as they pass through the filter, allowing fine particulates and biological

contaminants to be captured effectively without a large increase in pressure drop. This means filtration performance can be improved without significantly increasing fan energy.

Some modern ventilation units incorporate this type of filtration directly within the system. For example, Clivet's thermodynamic MVHR system 'ELFOFresh EVO' uses an electrostatic filtration stage alongside conventional filters, allowing pollutants such as fine dust, pollen and bacteria to be removed while maintaining efficient airflow. An alternative option would be Sabiana's fan coil units that can also be fitted with integral electrostatic filters.

Clearly it is not enough for ventilation systems to simply move air, but to actively improve indoor environmental quality.

**Integrated solutions for modern buildings**

It feels like the industry is moving towards more integrated solutions rather than treating ventilation, heating and cooling as completely separate systems. In high-density developments where windows may remain closed for long periods, maintaining IAQ often requires a fully mechanical approach which some manufacturers, like Clivet, are already prepared for.

Thermodynamic ventilation systems are one example of this trend. By combining heat recovery, filtration and active heating or cooling, these systems can provide continuous air renewal while also helping control temperature and humidity.

This concept is continuing to evolve, with newer systems integrating heat pump technology and domestic hot water production alongside ventilation. Products such as Clivet's FULLNESS build on this principle, combining ventilation, filtration,

heating, cooling and hot water generation in a single appliance. Plant space is also becoming a limiting factor, which can affect how ventilation and IAQ systems are designed which is why the FULLNESS can be configured as two modules.

As buildings become more constrained, this type of integration is likely to play a bigger role in enabling designers to deliver both good indoor air quality and efficient building services within increasingly complex buildings.

**Competence, commissioning and the performance gap**

Alongside advances in technology, there is growing recognition that good indoor

Clivet's FULLNESS product



air quality depends heavily on correct design, installation and commissioning. While writing this article I was completing the commercial ventilation course with Greenskills Academy, and it highlighted how much detail is involved beyond basic airflow calculations.

What struck me most during training was how often systems do not perform as intended once installed, even when the design was correct. **John McGregor**, ventilation lecturer at the academy, commented that correcting poorly installed ventilation systems is likely to become a significant part of the industry in the coming years.

At McGregor's suggestion I installed an IAQ monitor in my own home which quickly showed how easily air quality can deteriorate without effective ventilation.

**Raising the profile of ventilation**

The effort within the industry to raise the profile of ventilation itself must be celebrated. During discussions around World Ventilate Day (November 8th), **Professor Cath Noakes** highlighted that ventilation is not only about air quality but also about managing temperature, humidity and comfort, making it a critical part of building performance.

Ventilation is important and you should be proud to be involved in it, says **Simon Jones** on the Air Quality Matters podcast. The industry needs pride.

IAQ can no longer be treated as a secondary consideration in building services design. Tighter regulations, greater awareness, improved technology and more challenging building environments mean ventilation systems now have to do far more than deliver minimum airflow rates. 🇬🇧

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# Turning IAQ advocacy into action: Step one: Measure, Respond and Improve

**Matt Maleki**, Business Development Manager and IAQ Specialist, Carrier Commercial HVAC, discusses why the BESA global Indoor Air Quality (IAQ) pledge marks a pivotal moment for the industry and how defining a practical “Step One” could turn awareness and intent into meaningful action.



## Carrier Air Conditioning for residential buildings

When the Building Engineering Services Association (BESA) joined 150 worldwide organisations in signing the Global Pledge for Healthy Indoor Air<sup>1</sup>, it felt like a landmark moment for the HVAC industry. This unified commitment recognises that the air inside our buildings is equally important to our health as outdoor air, though often less visible. Yet, as encouraging as the pledge is, it also highlights the collective challenge we now face: translating shared ambition into measurable, everyday improvements.

Across the UK, regulation is tightening and awareness is growing. Awaab’s Law<sup>2</sup>, which came into effect in October 2025, will hold social landlords to account for mould and damp, marking an important step towards healthier living environments. But the truth is that IAQ does not stop at housing associations or rented homes. It affects every building where people live, work, learn and recover. The conversation must therefore shift from pledges and

position statements to practical, achievable steps that begin improving air quality today.

## The momentum behind IAQ

The public conversation around air has changed dramatically over the past decade. What was once the domain of engineers and environmental scientists has now become part of mainstream thinking. Campaigners such as Rosamund Adoo-Kissi-Debrah, following the tragic loss of



**Matt Maleki**, Business Development Manager and IAQ Specialist, Carrier Commercial HVAC

her nine-year-old daughter Ella, attributed to air pollution, have helped bring a more personal perspective to the issue. Their work reminds us that air pollution, indoors or out, has consequences measured in both statistics and lives.

This awareness has created momentum that regulators, developers and manufacturers can’t ignore. Employers are beginning to view IAQ as part of their duty of care and tenants are asking questions about ventilation, filtration and the hidden systems that make a space feel “fresh.” In that sense, the BESA pledge is timely. It signals alignment across sectors and a willingness to act.

But awareness alone will not clean the air. If we stop at pledges, we risk congratulating ourselves for setting intentions rather than achieving outcomes. The real work lies in defining what progress looks like and making sure it’s realistic for everyone involved, from manufacturers and developers to specifiers, contractors, and facilities managers.

## The frameworks we have and the one we still need

The UK’s regulatory landscape already acknowledges IAQ, but mostly through the lens of ventilation and energy efficiency. Part F of the Building Regulations, written in 2010, establishes the minimum airflow rates and design principles to prevent buildings from becoming airtight boxes, and a 2021 amendment introduced CO<sub>2</sub> monitoring for new dwellings.

Part O, introduced in 2022, addresses overheating, a crucial issue as our homes become better insulated and summers become hotter. Together, they provide the structural legislation for how air moves through a building.

But what they don’t yet do is guarantee the quality of that air. Apart from CO<sub>2</sub> monitoring in some new dwellings, there is currently no binding requirement to monitor pollutants, no consistent method to demonstrate filtration performance, and no mechanism to link IAQ data to system

control or efficiency. The forthcoming updates to Part B, covering fire safety, may indirectly influence IAQ through ventilation and fire-safety coordination, but the direction of travel remains piecemeal.

We can see where it's heading. Net Zero 2050 and the UK's wider sustainability agenda are already prompting policymakers to adopt more explicit IAQ metrics. Research into pollutants from cooking, cleaning and heating is informing proposals that could one day mandate the use of monitoring or purification systems. But waiting for perfect legislation could cost time, efficiency and health. The knowledge exists, the technology exists, and the cost barriers are falling. The opportunity and responsibility sit with us.

### Step One: A pragmatic path forward

I believe the industry is ready to define a voluntary "Step One" baseline for IAQ. It would not be a sweeping overhaul of how we design and operate buildings, but a practical, evidence-based starting point that everyone can understand and apply.

Step One means every building should, at a minimum, monitor CO<sub>2</sub> and PM2.5, apply ISO 16890 filtration and enable responsive ventilation control.

At its heart lies a straightforward principle: measure, respond and improve. To do this, we need to make air quality visible. To collect data on carbon dioxide, particulate matter and other IAQ indicators using reliable sensors, not as a box-ticking exercise but as a feedback loop that informs real decisions. From there, buildings can respond automatically through demand-controlled ventilation, adjusting airflow according to system occupancy and pollutant levels. Add to that effective filtration, verified under ISO 16890, which classifies filters by particulate matter (PM) removal efficiency, to capture PM10 and PM2.5, and we begin to see measurable differences in both health, comfort and building efficiency.

The systems already exist. What's missing is consistency and confidence: a shared understanding that these measures are the baseline, not the gold standard. A collaborative approach can highlight what can be achieved and how effective that could be. Once widely adopted, Step One could be the bridge between aspiration and regulation, proving that progress is

possible long before it becomes mandatory.

### From data to decisions

We have spent years equipping our buildings with sensors, yet much of that intelligence sits unused. Data alone changes nothing; its value lies in how we act on it. If a monitor identifies poor air quality but no one assesses and improves the system, the information is wasted. The same is true for maintenance logs and filter performance data that never leave a clipboard.

The more we use these insights, the more meaningful they become. When ventilation automatically responds to rising CO<sub>2</sub> levels, or when filter-change intervals are based on measured performance rather than fixed schedules, the data closes the loop. Occupant well-being improves, energy consumption falls and confidence in building systems grows.

The energy connection is particularly important. Studies, supported by CIBSE and the International Energy Agency (IEA)<sup>3</sup>, show that HVAC&R systems may, on average, account for well over half of a commercial building's energy use, with one study estimating this figure to be at more than 60 percent. Automated control strategies that vary airflow based on real-time IAQ can reduce consumption by as much as 40 percent. In other words, clean air and efficiency are not opposing goals. A healthy building is an efficient building.

### Learning from the regulations we already have

Part F presents an interesting model for structuring IAQ improvement. It uses a tiered approach, matching ventilation measures to a building's characteristics. We could apply the same principle to air quality itself: a staged progression that recognises where each building starts and what is achievable within its constraints.

Imagine a roadmap with incremental steps rather than a single all-encompassing standard. Step One could focus on monitoring and basic filtration. Step Two might integrate automation, increased IAQ monitoring and energy optimisation. Step Three could introduce continuous auditing and predictive maintenance. By viewing improvement as a journey rather than a

destination, we make participation possible for every project, not just the newest or most advanced.

Crucially, this approach also allows data to guide policy.

### Bridging indoors and outdoors

True progress on air quality requires both action and advocacy. That principle underpins Carrier's collaboration with Pollution Solution on Roadvent<sup>®4</sup>, a road emissions-capture system to be installed in Lewisham in 2026 that removes road pollutants and has demonstrated reductions in exposure of up to 91% at child height in pilot testing. It's a project that moves beyond pledges and into measurable results. The same mindset should guide the regulatory approach to indoor air quality.

The technologies may differ, but the purpose is shared: to make the air around people visibly, measurably better.

### A human-first call to action

Ultimately, this conversation is about people. Behind every data point is someone trying to focus at their desk, recover in a hospital bed, or rest in a well-sealed home. Clean air is the foundation of comfort, productivity and health. It shouldn't be a premium feature available only in the most advanced buildings; it should be the starting point for all of them.

The industry has studied IAQ extensively. We understand the science and the technology. What we need now is the confidence to implement the first step while we continue refining the rest.

If we can collectively define and adopt that Step One baseline, we will have taken the most important stride of all: moving from discussion to demonstration. And once people begin to experience fewer complaints of tiredness, improved focus, lower absenteeism, and additional benefits for energy consumption and efficiency, the next steps will follow naturally.

Carrier welcomes collaboration across the supply chain, from developers and system designers to operators and policymakers, to help define a shared Step One baseline for indoor air quality. Together, we can turn shared intent into measurable progress. 

Source

1. [www.thebesa.com/besa-latest-news/besa-signs-global-indoor-air-quality-pledge](http://www.thebesa.com/besa-latest-news/besa-signs-global-indoor-air-quality-pledge)
2. [www.gov.uk/government/news/awcabs-law-to-force-landlords-to-fix-dangerous-homes](http://www.gov.uk/government/news/awcabs-law-to-force-landlords-to-fix-dangerous-homes)
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4. <https://www.roadvent.com/>

# TR19® Air – How to meet new ventilation hygiene standards

With a new certification pathway for ventilation hygiene and continued regulatory focus on building safety and indoor air quality, **Gary Nicholls**, Managing Director of Swiftclean and co-author of BESA TR19® Air, explores the shift from reactive to predictive maintenance and how FMs and contractors can ensure compliance.



Gary Nicholls, Managing Director of Swiftclean

in 2014 to reference BS EN 15780:2011, the British and European standard for ventilation system cleanliness.

Over time, it became clear that kitchen extract ductwork and general ventilation systems each warranted their own dedicated specification. TR19® Grease addressed the former in 2019, establishing the fire risk management of grease accumulation within kitchen extraction system as a recognised fire safety prevention measure. TR19® Air was first published in 2024 and together the two documents provide a robust framework for managing both fire risk and indoor air quality in commercial, residential and industrial buildings.

## Meeting the requirements

At the heart of TR19® Air is a risk-based approach to cleanliness classification. In accordance with BS EN 15780, systems are categorised as high, medium or low based on the purpose and function of the spaces they serve. A building can have multiple classifications for different zones, for example, a ventilation system supplying a hospital operating theatre or pharmaceutical laboratory would be classified as high, whereas general office or educational environments typically fall into the medium category. Spaces such as plant rooms and storage areas are classified as low.

The classification determines both the frequency of inspection and the point at which cleaning becomes mandatory



Ventilation training being conducted

Ventilation hygiene is central to building health, safety and performance. Dirty ductwork harbours airborne contaminants such as dust, pollen, bacteria and mould spores, circulating them through the air where people work and live. Debris from construction or industrial processes or general operation can build-up over time, restricting airflow, affecting air quality and negatively impacting HVAC energy efficiency.

When you consider that the internal surface area of a ventilation system is roughly equivalent to 10% of the floor space they serve, the case for regular cleaning is compelling. However, it is often overlooked. Ductwork gets cleaned when something goes wrong, or on a fixed maintenance schedule with little regard for system condition, occupancy or usage patterns.

With the publication of TR19® Air<sup>1</sup> in April 2024 and the launch of the Vent Hygiene Register (VHR) Air certification pathway in March this year, the industry now has a clear specification for ventilation hygiene and a robust certification scheme to support competence and compliance. It also marks a shift in how ventilation maintenance is approached, from reactive or routine intervention towards a more predictive model based on risk and system condition.

## TR19® Air

TR19® published by the Building Engineering Services Association (BESA) sets out the specification against which ventilation ductwork must be tested, inspected and cleaned. The first edition was published in 2005, with a second edition following

in compliance with TR19® Air. Post-clean, all systems must first and foremost be visually clean and high cleanliness class systems must meet a cleanliness level of less than 0.3 g/m<sup>2</sup> using the European Vacuum Testing method, which provides a measurable, verifiable standard rather than a subjective visual judgement.

**Building safety standards are changing**

The Building Safety Act 2022 has brought monumental changes to building safety, maintenance, accountability and record keeping. One of the Act’s most important principles is the requirement for auditable evidence of building services, systems and maintenance; what the industry refers to as the ‘golden thread’ of information. TR19® Air and the VHR directly support this requirement by providing the framework within which that evidence can be generated and retained.

Employers are bound by the Health & Safety at Work Act etc 1974 and the Occupiers Liability Act 1984 to provide a safe and healthy environment, including adequate supply of fresh or purified air. HVAC systems must be regularly inspected and ductwork cleaned as appropriate and subject to ‘a suitable’ system of maintenance, which is defined by TR19® Air and BS EN 15780. Additional requirements may apply to some settings, for example, accommodation and public facilities, or hospitals, where HTM 03-01 sets more stringent requirements for ventilation performance and cleanliness.



In addition to legal obligations, many insurance providers will require evidence of TR19® compliance in the event of a claim. Non-compliance puts policies at risk and may leave businesses financially liable.

Importantly, TR19® Air and DW145 specifically addresses the inspection, testing and maintenance of fire dampers within ventilation systems; critical devices that control the spread of smoke and flames. When fire dampers fail, the absence of compliant, ‘golden thread’ maintenance records could leave responsible parties exposed on many fronts.

**Make maintenance predictive, not reactive**

Perhaps the most significant development alongside TR19® Air is the formal certification pathway introduced through the Ventilation Hygiene Register (VHR) Air category, operated by BESA, the certification arm of BESA. Contractors can join the scheme, which provides clear instruction when it comes to certifying ventilation system inspections and cleans demonstrating competence and compliance, a bit like the Gas Safe register for works associated with Gas.

Under the VHR Air framework, ventilation system inspection and cleaning must be certified by a registered member contractor. A post-inspection or post-clean verification report together with before and after photographic evidence of system condition must be provided, creating an auditable record that directly supports Building Safety Act compliance. Over time, this record enables responsible parties to identify trends, anticipate deterioration and schedule cleaning at the point it is actually needed, reducing costs and improving building health.

**Invest in competence**

VHR members must employ competent technicians who hold recognised BESA qualifications. Two training courses provide the formal competency assessment framework that underpins VHR certification:

- **Air Hygiene Operative (AHO):** This three-day course is designed for technicians carrying out inspection, access and cleaning activities. Training covers everything from system recognition and safe access to cleaning methods and sustainability practice, in accordance

with the TR19® Air specification. Candidates are assessed on both theory and practical activities to ensure their work and knowledge meets the standard required for VHR-certified outputs.

- **Air Hygiene Technician (AHT):** This two-day upskill course is aimed at those working in supervisory and managerial roles, for example, overseeing teams, developing risk assessments and verifying cleanliness post-clean. Training extends into system risk assessment, hazardous contamination, waterborne contaminants in air handling units and the commercial and legal implications of compliance failures. It equips supervisors to lead by example, manage the full scope of a TR19® Air-compliant programme and carry accountability for the quality and integrity of certified outputs.

**Best practice advice**

Contractors carrying out compliant ventilation hygiene works should address the following areas:

- **Define cleanliness quality class:** Agree on the cleanliness class for each stem and document it.
- **Plan access:** Ensure sufficient access panels are installed for inspection and cleaning.
- **Schedule regular inspections:** Follow TR19 Air’s recommended intervals and adjust based on risk assessment.
- **Verify cleanliness:** Use visual and quantitative methods to confirm compliance.
- **Document everything:** Maintain detailed records, including inspection and post-clean reports, photographs, and schematic drawings.
- **Demonstrate competence:** Choose BESA accredited training and join the VHR. Ventilation hygiene has always been important for the health of commercial and public buildings, but TR19® Air and the VHR Air certification pathway have raised the bar, providing a robust and independently verified framework for good practice and compliance. I would encourage contractors to embrace these developments; get trained, join the VHR and adopt verifiable, predictive maintenance as standard practice. 🏠

Source  
1. [www.thebesa.com/besa-toolkit/tr19](http://www.thebesa.com/besa-toolkit/tr19)



## How lifecycle refrigerant management works and can support industry transition and development

Supporting the transition of the HVAC-R sector requires investment in innovative technologies and services such as those developed by A-Gas, a global leader in Lifecycle Refrigerant Management (LRM). “We work to reduce the risk of serious environmental harm caused by refrigerant gases with high ozone-depleting and global warming potential,” explains **Elvira Nigido**, Group Sustainability Compliance Manager.

By 2050, demand for refrigeration could at least triple, potentially leading to almost double the greenhouse-gas emissions compared to 2022 levels (UNEP, Global Cooling Watch 2025).

How can the dynamics of the HVAC-R sector be rethought from a sustainability perspective? Two complementary pathways can help reduce the environmental impact of refrigerant gases. The first involves the circular management of existing refrigerants, which can be recovered and reclaimed. The second is the adoption of low-GWP (Global Warming Potential) alternatives.

A-Gas, operates along both directions. “As our Sustainability Report explains, historically at A-Gas we were a re-packer and supplier of virgin refrigerants. Over the years, we have been transitioning and differentiating our value proposition to become a market leader in championing refrigerant circularity and enabling the supply of lower-GWP replacements”, says Elvira.

### Refrigerant gases: The evolution of regulation

In line with global commitments and EU’s recent regulatory changes; Defra launched a consultation last year proposing a preferred

“highambition” option that would accelerate the currently legislated reduction steps from 2027 onwards, reaching an 83.8% cut in quota levels by that year and culminating in a 98.6% reduction by 2048.

However the significant quota cuts are raising concerns within the HVAC-R industry as it fails to include critical support mechanisms – such as enhanced recovery and reclamation processes or specialized technical training – necessary to manage the shift away from virgin refrigerants effectively.

### How lifecycle refrigerant management works

Lifecycle Refrigerant Management is built on a simple but powerful principle: recover, reclaim and reintroduce existing refrigerants into the market, preventing them from being released into the atmosphere or prematurely destroyed. By investing in innovative equipment and services such as Rapid Recovery, Rapid Exchange and Refri-Claim, A-Gas provides practical and tailored approaches.

“Recovered gas is often out of specification due to its use or the way it has been previously managed. Depending on the nature and level of contamination, we have invested heavily in deploying various reclamation technologies. This gives us plenty of capacity to clean and reclaim the used gas to AHRI 700 standards, which is equivalent to virgin-grade product specifications. Once refrigerant has been reclaimed and meets AHRI specifications, there is no differentiation between reclaimed and virgin products,” explains Elvira.

When reclamation is not possible, refrigerants are safely destroyed using UN-approved and TEAP-certified technologies, permanently removing the potential for future emissions. “By leveraging off compliance programmes and voluntary carbon market methodologies, we have been able to create tradeable carbon credits from the destruction

of eligible material, whose value can lead to further investments in LRM efforts” says Elvira.

### Ongoing challenges: Existing refrigerant banks and difference between recycling or reclamation

Despite these advances, several challenges remain. One of the main risks concerns existing refrigerant banks - the quantities of substances contained in equipment and products that have not yet been released or recovered.

“This represents a significant and hidden climate challenge that has historically not been addressed and from which an important opportunity for circularity worldwide can arise”, continues Elvira Nigido. “Working with governments and local industry stakeholders to raise awareness about the risks posed by existing banks of refrigerants and their potential impact if left unmanaged is a critical starting point”.

Another challenge the distinction between recycling and reclamation. Recycling involves a basic cleaning process which allows the refrigerant to be recovered with the limit of being re-used within the same system from which it was recovered.

Reclamation, is a more advanced industrial process that restores the refrigerant to purity levels equivalent to those of virgin product, meeting AHRI 700 standards; and allows reclaimed refrigerant to be reintroduced onto the market without technical limitations.

### A sustainable future

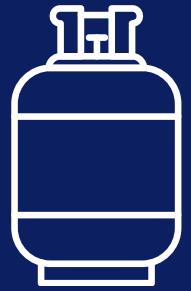
The scale of the opportunity to build a sustainable future is huge: “There is still much scope and potential and there is no shortage of collective work remaining to be done”, Nigido concludes. “Through our LRM offerings and stakeholder partnerships, we will continue to invest in and expand recovery channels across regions. By maximising the useful life of refrigerants and limiting the opportunity of release into the atmosphere, we can reduce the risk of serious environmental harm”.



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# Free cooling in data centres: why mixed mode operation so often fails

Data centres are under intensifying pressure to reduce energy consumption. Rising electricity costs, power grid limitations, net-zero commitments and tightening regulatory scrutiny have all placed cooling performance firmly in the spotlight. **Tim Mitchell**, Sales Director at Klima-Therm, explains the important role free cooling - using ambient air or water to reject heat rather than relying solely on mechanical refrigeration - can have in keeping data centre energy usage in check. He warns that not all free-cooling solutions are created equal, however.

Free cooling has been around for some time, but is experiencing increased popularity in data centres for two main reasons:

- **Air-cooled systems:** Hot aisle containment raises cooling coil air-on temperatures, which means chilled water temperatures can also be raised whilst still delivering the required cooling duty and increased efficiency.
- **Liquid-cooled systems:** The efficiency of direct to chip cooling also permits elevated chilled water temperatures.

In theory, the case for free cooling is compelling. In practice, many free cooling installations fail to deliver anything like their promised performance due to a lack of adaptability. Despite the fact that many chillers claim to prioritise free cooling, with mixed mode operation where possible, the reality is that competing component requirements create a far more binary affair.

## The mixed mode problem

Most modern free cooling chillers claim to support 'mixed mode' or 'partial' free cooling, where mechanical refrigeration and free cooling operate simultaneously, allowing a smooth transition from full free cooling at low ambient temperatures to full mechanical cooling at high ambient temperatures, maximising free cooling hours across the year.

In most cases, however, free cooling is either fully on, or it is effectively off. The reason lies in a fundamental control conflict.



**Tim Mitchell, Sales Director at Klima-Therm**

To maximise free cooling, condenser fans need to run fast, increasing airflow across the free cooling coils. When compressors are operating, refrigerant controls typically require much lower fan speeds - particularly in cold weather - to prevent over condensing and over cooling of the refrigerant. If fans are allowed to run too fast while compressors are active, the refrigerant system can be driven outside safe operating limits, risking serious compressor damage.

To protect the compressors, control systems would prioritise refrigerant stability over free cooling potential. Fan speeds are reduced to suit the vapour compression cycle, but in doing so, the available free cooling capacity collapses. The result is a system that technically supports mixed mode operation but spends very little time exploiting it.

## Paying twice for poor control

The consequences of ineffective mixed mode operation are significant. When free cooling is not used to its maximum potential, compressors are forced to run far more often than they should. Energy consumption rises, operating costs increase, and the efficiencies and carbon savings that justified the free cooling investment fail to materialise.

As a result, operators end up paying twice: first for free cooling technology that is never fully utilised, and second for compressor energy that should not be required for large portions of the year. In some installations, thousands of potential free cooling hours are lost annually simply because the system cannot manage the transition between cooling modes effectively.

## Designing free cooling as a primary function

One of the most common mistakes in free cooling design is treating it as an add on rather than a core operating mode. Many chillers are fundamentally vapour compression machines with free cooling bolted on, rather than systems designed from the outset to prioritise free cooling whenever conditions allow. By contrast, in systems where free cooling is integral to the design this state is achieved for as many hours as possible, not just during periods of very low ambient temperature.

### Adaptive controls: The real differentiator

The single most important factor in effective mixed mode free cooling is adaptive control. Rather than forcing all components to operate according to a single, rigid strategy, adaptive systems actively manage and isolate parts of the refrigerant circuit to suit prevailing conditions.

By using isolating valves within condenser coil banks, redundant sections of the refrigerant system can be shut off when free cooling potential is high. This allows fan speeds to increase to maximise free cooling without compromising the vapour compression cycle. The result is genuine partial free cooling: maximum heat rejection from ambient air, with minimum compressor run time.

True adaptive control avoids the 'all or nothing' behaviour seen in many mixed mode systems and restores the smooth operating curve that free cooling promises in theory.

### Addressing the glycol penalty

Another often overlooked factor in free cooling performance is the use of glycol. While glycol is commonly added to chilled water systems to provide freeze protection, it comes with significant penalties: increased pumping energy, reduced heat transfer efficiency and higher environmental risk in the event of leaks.

Integrated glycol free free cooling systems eliminate these drawbacks entirely, reducing parasitic losses and avoiding the long term costs associated with maintaining large volumes of glycol over the life of the plant. For many data centres, particularly those with elevated chilled water temperatures, glycol free designs represent a straightforward route to improved sustainability and efficiency.

### What the numbers really show

The impact of effective mixed mode free cooling becomes clear when operating hours are examined. In a typical London data centre scenario, a system designed to maximise free cooling can operate in partial mode for more than 99% of the year, with full free cooling available for a significant proportion of those hours.

Systems with less sophisticated controls may technically qualify for free cooling during similar ambient conditions, but in practice achieve only a fraction of the full

free cooling hours due to over condensing constraints and conservative fan control strategies. The resulting difference in annual energy consumption can be substantial, even though both systems are marketed as 'free cooling' solutions.

### Making free cooling work in practice

For engineers and operators looking to implement free cooling effectively, several lessons stand out:

- **Design for reality, not extremes.** Systems should be optimised for the conditions they will experience most of the time, not the rarest design day.
- **Prioritise adaptive control.** Without intelligent isolation and modulation, mixed mode free cooling will always underperform.


- **Select components that support flexibility.** Compressors, coils and fans must be capable of stable operation across a wide range of conditions.
- **Minimise parasitic losses.** Eliminating unnecessary glycol and reducing pumping energy can unlock further efficiency gains.

Free cooling can deliver exceptional energy savings in data centres - but only when it is treated as a primary operating mode, supported by the right controls and components. When mixed mode operation is engineered properly, free cooling becomes a reliable, everyday contributor to lower energy use, reduced carbon emissions and improved operational resilience.

### Best in class free cooling

QUANTUM Air is Engie Refrigeration's highly efficient air-cooled chiller series, developed for maximum energy efficiency and sustainability. Using state-of-the-art compressor technology and an optimised free-cooling system, QUANTUM Air provides reliable and environmentally friendly cooling for data centres.

What sets this product apart from other similar products is that free-cooling is integral to its operation; it has been designed with no compromises, specifically to deliver free-cooling for as many hours as possible, not just when ambient temperatures are very low.

Compared with its competitors, in some instances QUANTUM Air provides thousands more hours of free cooling at points where comparable technology might still be using compressors to keep data centre temperatures stable. 



Engie Quantum Air Chiller

# Commercial Refrigeration Insulation – why a collaborative approach is key

**Chris Ridge**, Technical Director of the Thermal Insulation Contractors Association (TICA), explains why we cannot afford to treat thermal insulation as an afterthought and lays out a pathway for industry collaboration that could make a real and lasting difference.

TICA represent specialist contractors who insulate and clad pipework, ductwork and associated equipment. TICA members do not typically insulate commercial refrigeration services such as VRV/VRF pipes, and any issues related to commercial refrigeration installations were previously not on our radar. This all changed in early 2025 when I was approached by Lawrence Leak FlntR, an Air Conditioning Inspector with a lot to say about thermal insulation!

Lawrence was able to provide clear evidence that thermal insulation was often failing within months of installation on many commercial refrigeration projects. It soon became clear that whilst the solutions were available, there was a real lack of awareness about the actual problem. We resolved to raise awareness and encourage collaboration, and with the help of the Institute of Refrigeration, we began to build a bridge between our trades.

## Raising awareness

So, what is the actual problem?

The standard practice is for refrigeration contractors to insulate refrigeration pipes with flexible foam products such as flexible elastomeric foams, (commonly referred to as “nitrile rubber”). Standard nitrile rubber products are suitable for internally located applications but is not suitable for external locations. Weather and UV-resistant alternatives are marketed but rarely utilised.

Installing non-UV resistant flexible foams in external locations can result in embrittlement and degradation of the material – a process that can start within days of the installation.



The first sign of the insulation breaking down can be seen when the outer layer loses its smooth texture and starts to become brittle. As the insulation degrades, it loses its closed-cell structure and starts to absorb moisture, effectively turning into a sponge.

Degradation of the pipe insulation will lead to increased energy costs and increased operational carbon. Saturated insulation will also increase the risks of corrosion under insulation.

Ultimately, clients are left with an inadequate installation that can only be rectified with an additional financial and embodied carbon cost. However, rooftop services are often “out of sight, out of mind” and unlikely to be rectified during the lifetime of the installation.

There is no single point of failure in the supply chain, and awareness needs to be raised throughout

the contractual route to avoid expensive mistakes occurring. Building Services Consultants and Contractors need to be clear in their specifications for externally located insulation. Specialist Refrigeration Contractors need to ensure that they are installing suitable products. Finally, manufacturers and distributors need to work together to make sure that weather and UV-resistant systems are easily accessible when required.

More emphasis also needs to be placed the condition of pipe insulation during TM44 Air Conditioning Inspections. Has the inspector checked whether the insulation is UV-resistant or if it has begun to embrittle due to UV damage and weathering?

## The system

More thought needs to be given to the overall system of insulation. How is the insulation supported and fixed? It is common to see refrigeration services cable tied together. Cable ties can strangle the insulation and reduce thermal performance. Cable ties can also cut into the insulation, aiding the embrittlement process.

**Chris Ridge**, Technical Director of the Thermal Insulation Contractors Association (TICA)



Insulation should be considered as a system. How is the insulation secured? Is there a vapour seal at fixing points?

The pipe supports also need to be considered. Common practice is for rubber lined clips or cushion clamps to be installed direct to pipe. Neither of these methods can promote a complete vapour seal and will promote water ingress.

Most manufacturers of nitrile rubber products also market matching insulated pipe support inserts to help maintain a complete vapour seal through the pipe support. Whilst these offer an improved solution, some products may not be UV-resistant and manufacturer guidance is recommended.

**Ongoing inspection cycles**

As the name suggests, UV-resistant thermal insulation offers greater resistance to UV damage – but this does not make the insulation UV-proof.

Inspection cycles will still need to be in place, even if the risk of degradation is far lower. The standard of insulation is reported with the CIBSE TM44 inspection every five years. However, it is only reported as ‘good or bad’ and there is no further guidance. Where it is suspected that non-UV-resistant flexible foams have been used, an immediate intermediate inspection should be carried out on the externally located insulation.

The five-year cycle leaves ample opportunity for non-UV-resistant insulation to break down and start losing heat

from the pipe. Humid air can then reach the surface of the pipe and condensate, leading to corrosion, ceiling damage and mould growth.

Even insulation protected with a professionally installed external cladding system can be susceptible to damage. Any weak point in the system could lead to water ingress and the potential for corrosion under insulation, so there is always a need for ongoing inspection.

The danger of damage from wildlife should also be considered in the maintenance cycle. Have additional measures been taken to protect the installation from winged wildlife (e.g. bird netting)? If the answer is no, then it is unlikely that the installation will last its expected lifetime, even if it is UV-protected and correctly vapour sealed.

**Providing clarity**

In all cases other than commercial refrigeration applications (i.e. Dx and VRV/VRF applications) and domestic applications, a specialist Thermal Insulation Contractor (TIC) should be appointed.

Why is the commercial refrigeration industry different to other related industries in this regard? Essentially, it’s because insulation of commercial refrigeration systems can typically be accomplished using flexible foam pipe insulation products that do not require the same level of installation skill as rigid foam products.

However, when thermal insulation is considered as a peripheral concern rather than the key focus, there is always potential for a knowledge gap to exist.

TICA have worked closely with the IOR to support new technical bulletins and guides and effectively help close the knowledge gap. The new version of BS 5970 (Thermal insulation of pipework, ductwork, associated equipment and other industrial installations in the temperature range of -100°C to +870°C. Code of practice) will also provide more clarity.

The need to clarify responsibilities is important. For example, industrial refrigeration and cold store installations absolutely require the appointment of a competent TIC. In a similar vein, single domestic heat pumps are typically insulated by the heat pump installer, but all communal and commercial heat pump installations require the appointment of a TIC.

Installation	TIC Required?
Domestic Heat Pumps*	NO
Communal Heat Pumps	YES
Commercial Heat Pumps	YES
Commercial VRX/VRF/DX*	NO
Industrial Refrigeration	YES

Breakdown of when a thermal insulation contractor (TIC) may be required on a commercial refrigeration/heat pump related project

**Working together**

Everyone has a part to play if we are to promote good practice on commercial refrigeration installations. For TICA’s part, we just hope that we can offer some insight based on the pitfalls faced by our own specialist contractors.

This is a systems problem, and we need to align the goals of consultants, M&E contractors, refrigeration contractors, distributors and insulation manufacturers with the energy saving goals of the client.

We should also consider the role of the plant manufacturers. Manufacturers of air conditioning and heat pump systems can often boast of improved efficiencies for their manufactured products, but perhaps they can be encouraged to engage on the efficiencies of the entire system and play a part in the bigger picture? I believe that equipment manufacturers could make a positive difference if they were to specify a suitable thermal insulation system for use with their products – this could have a far bigger impact than any incremental motor efficiency gains!

Chris continues to work with Lawrence Leask to build a bridge between the commercial refrigeration and thermal insulation industries most noticeably through “The Proof is on the Roof”. The primary purpose of this initiative is to “challenge the whole industry to address the enormous energy losses occurring because of badly insulated pipework on our rooftops, in our plant rooms and other easily forgotten spaces in our buildings. 🏠

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# Training to fill the skills gap

To celebrate the last National Apprenticeship Week, we opened the doors of our Training Centres and invited customers to bring their apprentices in for bespoke, hands-on sessions across our commercial and residential HVAC product ranges.

Having met and talked to the cohort that joined us in our Hatfield training suite, I have to say, I think it's encouraging that we have some brilliant, questioning minds joining our industry.

My colleagues at our Manchester training centre reported similar levels of enthusiasm and interest in the extensive range of HVAC products that they can chose to work with.

The ones visiting our Hatfield site were all from **Whithead Building Services**, with air conditioning engineer Lewys Willacott explaining: "When I started, I didn't know how much kit there was to do with HVAC and didn't realise air conditioning was so heavily used in the UK."

His colleague Emma Parslow, an M&E apprentice was delighted to get in front of live equipment saying: "I think it's super important to have hands on because there's only so much you can be taught in a classroom setting."

In addition to seeing and touching the actual heat pump and air conditioning equipment, both groups were particularly enthused by the VR headsets that we've developed as part of our training programme.

This helps us take engineers through all different types of products, including large chiller, air handling units and commercial heat pump systems that we can't physically get into the training rooms.

The VR system not only speaks to Gen Z in a language they readily understand, it also allows us to explore health and safety in a much more engaging way. It's worth remembering that electrical HVAC



Ben Bartle-Ross is a technical trainer at Mitsubishi Electric

systems can be dangerous unless proper procedures are in place. They also contain refrigerants that need careful handling.

Using VR, we can show engineers how to fix otherwise dangerous pitfalls in a way that no lecture or PowerPoint presentation can fully convey.



## A real opportunity

We know we have a skills gap within our industry, so National Apprenticeship Week is an important part of addressing how we fulfil that skills gap in our industry.

I see this as the perfect answer. If we can't find the right engineers, then we need to help create that type of engineers and apprenticeships will play a really important role.

Cole Caviell, Senior Project Manager at Whithead also focused on the bonus from an apprenticeship: "You gain a lot more than you do from university. When you go down the apprenticeship route, you get a lot of hands-on training, you learn a lot more, plus, it's also the monetary side of things but putting the money aside, you're learning and you're not lectured to death like you would be at university."

Mechanical Project Manager for Whitehead Building Services, Gareth Thomas, was full of praise for the event and recommended training with Mitsubishi Electric: "I think it's really beneficial. I don't think they get that anywhere else, I think it's super important for them for their learning and development."

For me, this highlights that the skills gap in our industry isn't just a challenge, it actually is one of our biggest opportunities.

What was most encouraging was hearing the questions and discussions that emerged from the event. The apprentices went from amazement at the size and scope of the HVAC industry to asking how they could get more involved.

As our sector continues to evolve with new technology, low carbon systems and increasing demand for energy efficient buildings, the need for skilled engineers has never been greater.

That's why investing in apprentices isn't optional... it's essential.



# Cirencester College learns to embrace sustainability with Daikin's R32 Heat Recovery System

Pc Kay Ransom Photography



In the heart of Gloucestershire, Cirencester College has made a powerful statement about its future in recent years, with newly constructed and refurbished facilities that reveal a clear commitment to the green economy. One recent project, the refurbishment of its 1960s era C-Block Art facility, begun in 2022 and completed 1 year later, was more than an investment in infrastructure, it firmly placed sustainability and innovation at the forefront.

## Raising the bar for sustainability in education

As part of its wider sustainability strategy, Cirencester College wanted a system that would both lower its environmental footprint and offer enhanced comfort for staff and students. Working with Smith Consult, EG Carter Ltd, and Envira-Mech Services Ltd, the College opted to install Daikin's latest VRV 5 R32 Heat Recovery System, a high-efficiency, low-impact HVAC solution that exemplifies what's possible in modern educational buildings.

"Sustainability is no longer a nice-to-have, it's a core part of how we make decisions at the College," said **Paul Watson**, Head of Estates at Cirencester College. "This refurbishment was about creating an

environment that reflects our values: low-carbon, flexible, and fit for the future."

The C-Block refurbishment forms part of a broader initiative to create future-proofed, energy-efficient learning spaces for students, studying A-levels, T-levels and vocational courses. We offer technical T-level qualifications in a diverse range of subjects including Design, Survey and Planning for Construction and Engineering. "T-Levels are preparing students for tomorrow's industries," noted Paul, "so it's only right that their learning environments reflect the cutting edge of building technology."

## Design for change

The design and specification for the new system were developed by Smith Consult,

with installation carried out by Envira-Mech Services Ltd., with a clear goal in mind: Maximise energy efficiency while integrating seamlessly into the building's structural limitations. The solution was Daikin's VRV 5 R32 Heat Recovery system, Daikin's leading-edge system that uses R32 refrigerant - a low global warming potential (GWP) alternative to traditional gases.

"The College wanted the most sustainable and future-ready system available," explains Andy Wright, Director of Envira-Mech. "Daikin's R32 Heat Recovery product ticked all the boxes, both from a design and performance standpoint."

With the help of EG Carter Ltd, who led the building works, and Envira-Mech, who undertook the mechanical installation, the

collaborative team delivered a solution that significantly modernised the building's core systems, replacing outdated boiler and radiator-based heating with a full Daikin heat recovery network.

### Smarter choices, smarter spaces

The transformation wasn't just technical, but also spatial. The three-storey C-Block was adapted to become a multi-purpose creative hub. The ground floor retained dining and kitchen facilities, while the upper levels were reshaped into open-plan classrooms and creative art workshops. These spaces now benefit from integrated heating and cooling, helping to maintain comfortable conditions all year round.

"Previously, the building relied on a failing boiler system," says Andy Wright. "The new setup provides not just efficient heating, but the added benefit of cooling - something that's becoming increasingly important in educational environments."

The technical solution involved installing three VRV 5 outdoor units, connected to a series of wall-mounted and ceiling cassette indoor units, with branch selector boxes enabling full heat recovery across multiple zones. The choice of R32 refrigerant was a key factor in the College's decision. "We want to be early adopters of sustainable HVAC technology," adds Andy. "R32 offers a significantly reduced GWP, which makes it a future-facing option for schools like this one."

### Delivered with care and safety

For Envira-Mech, this was not the first time working at Cirencester College. "We've delivered a number of successful projects



here," Andy continues. "So, when EG Carter came to us again, the process was smooth. We knew the site, we understood the expectations, and we were determined to deliver a best-in-class installation."

Installation took place across a nine-month window, from December 2022 through to September 2023, and included all aspects of the system -refrigeration pipework, condensers, fan coil units, condensate pumps, and more. "We ensured full compliance with EN378 standards throughout," Andy notes. "Our focus is always to deliver systems that not only work efficiently but meet the highest safety and regulatory benchmarks."

To further enhance quality, Envira-Mech worked directly with Daikin engineers to oversee the commissioning process.

"As a Daikin D1+ Partner, we're proud to be associated with projects that raise the bar. For us, it's not just about ticking boxes—it's about showcasing what sustainable HVAC looks like when it's done properly."

### Education through example

The system isn't hidden away, but fully on show, offering students and visitors a living example of sustainable design in action. "We want our buildings to teach, just like our courses do," says Paul Watson. "Having a visible, functioning example of best-practice energy technology, Like the HVAC system, encourages students to think differently about tech and the environment."

With the project complete and the system fully operational as of end 2023, Cirencester College can also point to similar solutions elsewhere on campus. "The Art Block refurb was just one of a number of recent campus constructions in the past few years that has set a new benchmark for us," Paul concludes. "It's the kind of future-proof infrastructure we plan to replicate, going forward."

Thanks to Daikin's R32 technology, a strong collaborative design and installation team, and the College's own commitment to sustainability, the C-Block refurbishment is more than a simple upgrade, it's a step towards a cleaner, smarter future for this forward-thinking educational establishment. 🌱



Pc Kay Ransom Photography

# WOMEN IN THE ACR INDUSTRY

**Giulia Kapp**, Head of Communications & Marketing at Daikin, shares her fascinating journey in HVAC, insights into her role and guiding mantras, and an inspirational message for women and young people considering a career in the industry.

## What was your first job?

My first job was in a bookshop when I was 15. Unfortunately, I got sacked for spending too much time reading the books.

When I entered the professional world, I ran my own marketing agency specialising in construction-sector clients, with a particular focus on sustainability. Back in 2009, Daikin became my most important client. After five years working with them as a consultant, I had learned so much about heat pumps that I knew I had to join the company.

## What does your current role involve?

The role covers the full marketing and communications mix, from event management and branding to corporate communications and digital marketing. It's highly varied and continues to evolve, especially with artificial intelligence reshaping the challenges and opportunities we face. I feel fortunate to have a great team and to work in an environment that encourages collaboration and experimentation to discover new ways of achieving strategic advantage.

## What excites you about the industry?

From the moment I first heard about Daikin heat pumps, I thought they were a hugely exciting development. I've always been drawn to communications that can have a positive social impact rather than simply selling products. The HVAC industry is about much more than shifting boxes. We can play a real role in tackling climate challenges, from improving indoor air quality and reducing the transmission of viruses to lowering the carbon impact of heating and cooling our buildings. It's an industry that delivers on every level: people, profit, and planet.

## How would you like to see your career developing?

Onwards, upwards – and perhaps internationally. I'm very open-minded! With my youngest daughter about to go to university, the next decade or two feels like a time of real freedom and opportunity. It will be interesting to see what comes next.

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

I've received plenty of good (and bad!) advice over the years, so it's hard to choose just one. The best advice tends to be the classic mantras: trust your instincts, work with good people, stay curious and never stop learning. One thing I particularly value is actively listening to my team; they're the ones delivering the work day-to-day and often have the sharpest insights.

## What challenges do you see facing the industry?

Clear and consistent government policy, alongside funding to support widescale heat pump deployment, will be critical in unlocking investment. There is also a huge need for green skills and training to keep pace with growing demand for heat pump technicians. Young people need to see a clear career path when making their choices. Closing the 'spark gap' will also be key to removing barriers to heat pump adoption and reducing running costs. Ultimately, the industry needs strong leadership and practical support from government to accelerate the transition to low-carbon technologies.

## What would you say to women considering a career in the ACR industry?

Join us, the HVAC industry needs more women. Engineering and technician roles are still overwhelmingly male, with only around 2% currently held by women. Hopefully, greater focus on green skills and more apprenticeship opportunities will encourage more young women to enter the field. In office-based roles the balance is already improving. At Daikin UK, women make up almost 27% of our workforce and hold around 50% of senior management roles. So, while there is still work to do, there are definitely opportunities for women to progress.

## Is there a little-known fact about you that might surprise people?

I've run five marathons, including two in the same week after a diary clash that I decided to embrace. I also sing in an award-winning chamber choir and we're competing in an international music festival next month. I suppose I enjoy pushing myself.

## Anything else you'd like to share with readers?

Daikin is the headline sponsor at Grand Designs Live in May, so if you'd like to find out more, come and say hello. [👉](#)

**Giulia Kapp, Head of Communications & Marketing at Daikin**



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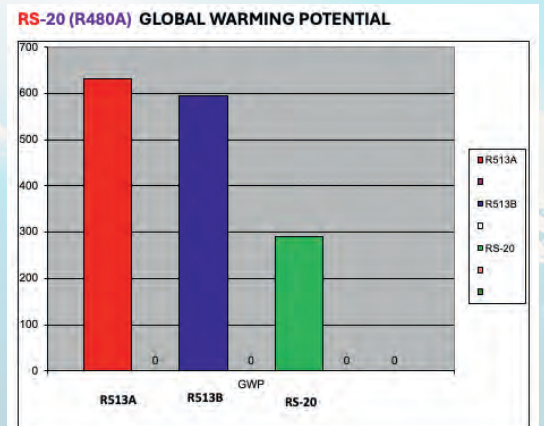
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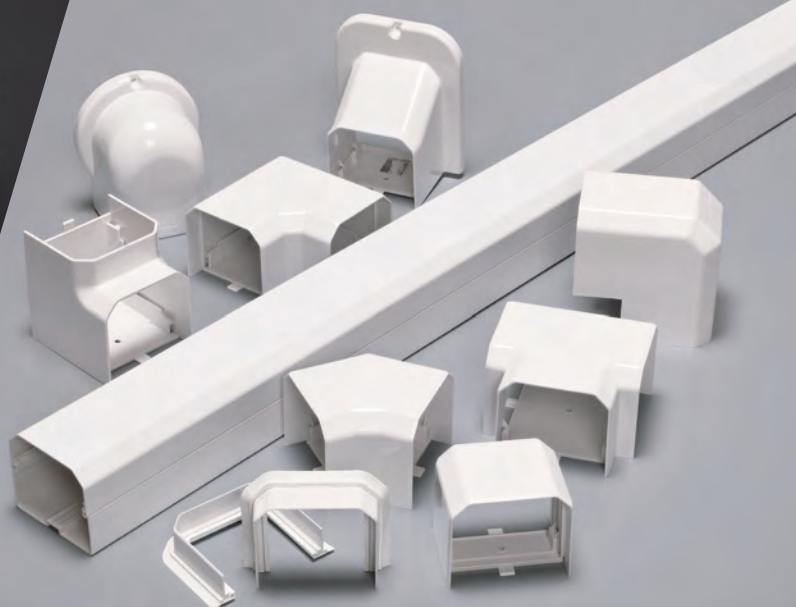
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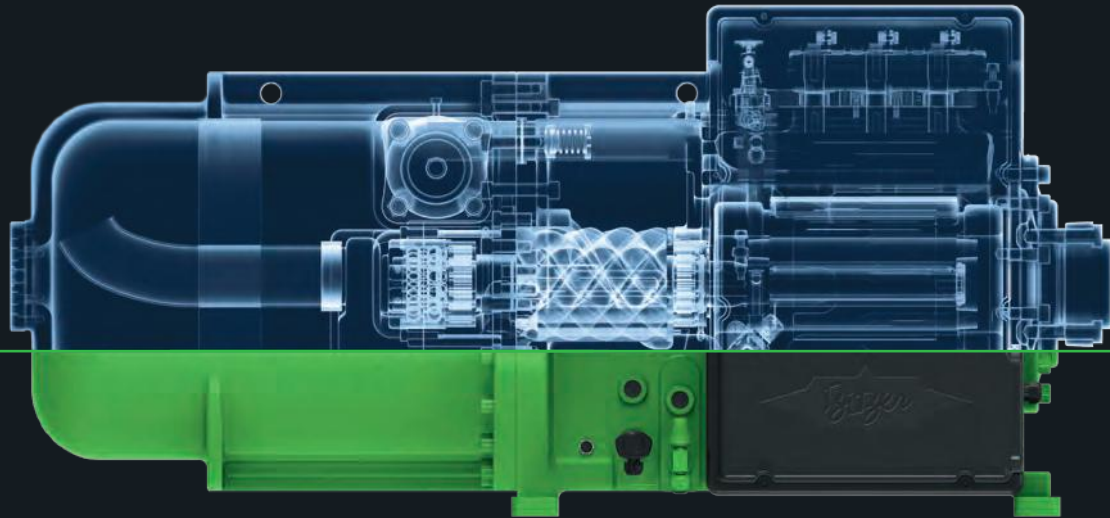
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