

MBS

MODERN BUILDING SERVICES

The independent journal for
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WELCOME TO THE FEBRUARY ISSUE OF MODERN BUILDING SERVICES

The people in this industry are what make it tick. I've had the pleasure of meeting many of you over the years and witnessing enthusiasm and innovation first-hand so it's always good to share news of new appointments and achievements. This month is no exception, with a number of these detailed in our news and people sections.

As we focus on heating in this issue, which still accounts for a quarter of UK carbon emissions, we examine why staying abreast of new technology is crucial and explore the latest thinking, while also taking a look at the dos and don'ts of achieving a future-proofed heat network.

Our Installer's View articles cover a wide range of issues this month, like the prevention of gas leaks and the effects they have, the advantages installation technology can bring to all projects and why early engagement with manufacturers can be invaluable.

Plumbing and heating systems play a key role when it comes to meeting the needs of school building occupants and this is put under the spotlight in this month's Vertical Focus.

Last but not least, be sure not to sign off without checking out the crucial actions to keep an eye on over the next 12 months as the UK energy landscape continues to undergo major changes.

We hope you enjoy reading this issue and we'd love to hear from you if you have anything to share in next month's feature sections:

- Conditioning, cooling, and ventilation
- Working buildings
- Piped services, pumps & water

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Mandatory CPD topics introduced by CIBSE

The Chartered Institution of Building Services Engineers (CIBSE) has introduced mandatory CPD topics for its members.

In addition to existing CPD requirements, members must now undertake and reflect on at least two CPD activities, one on sustainability and one on building safety.

This change is to ensure CIBSE members stay up to date on key industry issues and is being driven by the government's target to reach net zero by 2050 and the introduction of the Building Safety Act in 2023.

A key element of the requirement is the call for its members to reflect on their learnings. They are being asked not only to learn themselves but to share that knowledge with others.

Stephen Page MCIBSE, AtkinsRéalis, CPD Panel Chair said: "Mandating CPD on these two key issues will help ensure building services engineers stay informed on the latest technology and techniques in building safety and sustainability and can apply that knowledge in their daily working lives. In requiring our members to reflect on these mandatory topics we are asking them to consider how they can pass on their learning."

www.cibse.org

MBS prize draw winner announced

The winner of the Modern Building Services 2023 Prize Draw has been revealed as Adam Granger of consultants RPS.

Entry to the draw took place over the summer and was open to anyone registering or re-registering to receive MBS, and prize options included a Bang & Olufsen speaker system, a case of Wine or Beer, or a deWalt 184 piece socket set.

As his prize, Adam chose a Supercar driving experience from Red Letter Days.

Adam said: "I'm really looking forward to the day," adding: "MBS Magazine is excellent and provides great insights into latest technical developments and new products."

Look out for our 2024 draw which could result in you winning our next prize.



Three new members welcomed by BPMA

The British Pump Manufacturers Association (BPMA) has welcomed three new members to its ranks.

The first company is Oxfordshire-based Ambic Equipment Ltd, which designs, tests, manufactures and assembles a full range of peristaltic pumps, dosing and dilution systems. It was established in 1977.

The second company is electric motor manufacturer Menzel Motors Great Britain Ltd, which has been manufacturing and distributing electric motors since 1927.

The third is Tsurumi UK Ltd, which has been manufacturing submersible pumps since 1924 for use in civil engineering, construction, wastewater treatment and domestic applications.

"It is heartening to know, especially during these somewhat challenging economic times, that the commercial benefits associated with BPMA membership are still very much valued by an ever-growing number of pump related businesses."



Wayne Rose,
BPMA Director
and CEO.

Carbon neutrality achieved over UK operations

Gripple, which manufactures suspension solutions for construction, has released its 2022 Sustainability Progress Report which reveals that the company has achieved carbon neutral for its UK operations.

It has reached its goal by focusing on improving energy management, investing in staff training and education and appointing Sustainability Champions in its business, the report states.

Sustainability Manager at Gripple, Tasha Lyth, said: "Carbon neutral for our UK operations is an important milestone on our journey to climate positivity and it also paves the way for our other manufacturing facilities across the world to do the same. We are extremely proud to have achieved this goal, through a focus on reducing carbon emissions, energy and water consumption, business travel and waste across all areas of our business."

In addition to achieving carbon neutrality for its UK operations, Gripple has been awarded a Silver Medal as a recognition of its EcoVadis Sustainability Rating, which allows benchmarking against industry peers and evaluation of overall sustainability performance.

www.gripple.com



Tasha Lyth, Sustainability
Manager at Gripple.

TM65 calculation documents available for Heatrae Sadia Multipoint Series

Baxi has announced the ready availability of CIBSE Technical Memorandum 65 Embodied carbon in building services calculation documents for the entire Heatrae Sadia Multipoint electric water heater series.

The company has produced the documents in response to the increased focus on evaluating, and ultimately reducing, the

embodied carbon associated with a building services system.

Baxi's Head of Public Health, James Matthews, said:

"By offering TM65 documents for our Heatrae Sadia Multipoint range, we hope to simplify the carbon calculation process, making it quicker and easier for them to evaluate."



PEOPLE

Four new appointments at BCIA

THE Building Controls Industry Association (BCIA) has appointed a new Vice-President and three new additions to its Management Committee.

Jen Vickers of Crown House Technologies has been elected as the next Vice-President, having joined the Management Committee in January 2023. She will take up her position in March.

Jen has worked for Crown House Technologies, which is part of Laing O'Rourke, since 2015. More recently Jen began managing the BEMS package on a number of projects. In April 2022, on behalf of the BCIA, she took responsibility for launching the BCIA Young Engineers Network (YEN) and delivered a programme of three YEN events before supporting the YEN to establish a more formal working group structure.

Describing herself as "an advocate for skills development", Jen said: "I will specifically focus on ensuring that the building controls industry builds a position as a 'career of choice' sector, particularly as we will soon see the first cohorts of apprentices on the BEMS Controls Engineer Trailblazer apprenticeship approach completion of their studies. I'm also keen to ensure that the BCIA becomes recognised as a trusted and expert voice within the political and policy-making space."

The new Management Committee members are Simon Ward of Distech, Clare Grams of Westminster Controls and Lewis Locke of BGES. Simon, who has previously served on the Management Committee, will officially join in March while Clare and Lewis took up their positions in January.

Simon has worked in the building controls industry for more than 30 years with both manufacturers and system integrators and has developed a wealth of knowledge regarding markets, products, solutions and customer base.

Lewis is a Regional Director with BGES Group and has previously served as a Marine Engineering Mechanic with the Royal Navy. He is keen to open more pathways for veterans into the building controls industry.

Clare has more than two decades of facilities management and controls experience and said she hopes to be a role model and advocate for empowering more women to pursue careers in the building controls sector.

www.bcia.co.uk



Simon Ward



lewis Locke



Clare Grams



Jen Vickers

BESA appoints first head of business development

The Building Engineering Services Association (BESA) has appointed Simon Lunt as its first Head of Business Development as part of a wider strategic review.

Simon started his career in the chemical industry in Scandinavia with Forchem Oy before moving into the health & safety sector, covering the UK construction, manufacturing and facilities management sectors at Arco.

He spent three years running his own sales training consultancy, during which time he supported firms in the facilities management and air filtration industries.

He has also worked in the specialised hostile environment gas detection business as Sales and Marketing Director for Analox, which supplied projects for the International Space Station, NATO submarines and the deep-sea diving industry.

During this time, he was an active member of the International Marine Contractors Association (IMCA).

"My role is to help the membership team add as much value to as many companies in the building engineering sector as possible," he said. "BESA offers a remarkable breadth of benefits, and we want our members to take advantage of everything they can, including getting involved in our working groups and committees which can effect real change across the sector."

"The industry is facing a period of considerable change particularly with the new scrutiny on working practices prompted by the Building Safety Act and serious challenges like skill shortages and the need to accelerate the decarbonisation of buildings, all of which reinforce the importance of the collective voice and momentum that trade organisations like BESA can provide."

www.thebesa.com





Domus Ventilation appoints new contractor sales managers

Ventilation systems manufacturer Domus Ventilation has announced the arrival of three new Contractor Sales Managers.

Stuart Bailey will cover the eastern England area while Joe Ash is covering London South and Mark Swain covers London North.

The three new managers each bring a wealth of knowledge in the HVAC sector and considerable experience in supporting contractors.

Stuart has spent 30 years in and around the HVAC industry, mainly within the contract and specification sector. He has held managerial level positions at Wolseley, Buildbase and Stelrad, as well as sales roles at Honeywell and Rexel.

"I have a good technical background and experience in seeing projects through from concept to completion," he said.

Joe had a very different start to his career. He was a touring musician before moving into ventilation. Initially working in marketing for a ventilation sub-contractor, Joe went on to create and run The Air Shop, an online retailer of mechanical ventilation products which quickly evolved into the design and supply of MVHR systems for new-build and retrofit properties.

"I worked in the complete end-to-end process so have good experience at each stage, which has given me a great insight into the level of education that is still needed for both end-users and contractors to ensure that they are getting the most out of their systems," he said.

Mark was formerly employed by Vent-Axia as Residential Area Manager in London and has in-depth experience of working with developers, contractors and consultants, including guiding them through changes to Building Regulations. Before this, he worked for boiler company Viessmann and a hygiene company, cleaning commercial AHU ducting, maintaining fire dampers and cleaning kitchen extractors.

www.domusventilation.co.uk

Heatly appoints new Technical Manager

Heat pump expert Paul Spence has been appointed as Technical Manager for heatly, a new app and supporting software company which is currently in development.

Paul runs Facebook group, Heat pumps UK, which has more than 10,500 members made up of consumers and those working in the sector. The page enables members to regularly ask questions, share information and support each other within the heat pump industry.

He said: "I started Heat pumps UK two years ago to provide a place where homeowners and heating engineers could post their queries. Poor installs, a lack of knowledge and failures in the systems in place that are supposed to ensure quality and safeguard customers, do nothing for the reputation of heat pumps. I've helped thousands of homeowners online and many with personal visits, from basic faults to quite complex issues.

"I met Griff Thomas (Director for heatly) via another Facebook group and had a chat on the phone after a debate over a technical point."

Paul has always worked in the heating industry, following in his father's footsteps in the early 1970s, helping him out after school, in the holidays and on weekends. After leaving school at 15, Paul went straight into an apprenticeship with Haden Young Ltd then joined the armed forces, serving on board HMS Ark Royal and HMS Newcastle and at a variety of shore bases, where he spent most of his time dealing with chilled water plant ACPs and flash evaporators generating drinking water from sea water, which use the same principles as today's heat pumps.

After leaving the armed forces, Paul set up his own heating business, primarily installing gas and oil-fired heating systems, which he has been running for more than 30 years.

www.heatly.com



New Sustainability Director for Wates Group

Wates Group, a family-owned development, building and property maintenance company, has appointed Cressida Curtis as its new Group Sustainability Director.

She will join the group's executive committee, reporting to Chief Executive, Eoghan O'Lionaird.

Cressida joins Wates from the ESG and Sustainable Business team at Brunswick, a critical issues firm, where she has spent the past three years advising UK and international companies. She brings two decades of experience across the built environment sector to the role, having previously been Head of Sustainability and Corporate Affairs at British Land. Her career has also included stints at Logicor and Quintain.

Cressida is a member of the Future Leadership Forum Advisory Board at the UK Green Building Council.

Wates recently announced that its 2045 net zero target for its scope 1, 2 and 3 greenhouse gas emissions has been validated by the Science Based Targets initiative (SBTi).

www.wates.co.uk





Specifying, and the **safeguarding** of students

Richard Bateman, Product Marketing Manager at RWC, explores the key role plumbing and heating systems play when it comes to meeting the needs of school building occupants.

Essential to the smooth, safe and efficient running of schools, plumbing and heating systems must withstand high levels of usage every day as well as perform reliably for years to come to maximise the stretched budgets of individual schools.

There are more than 30,000 schools and academies in the UK, providing dedicated learning environments for more than 10 million pupils and employment for more than 600,000 teaching staff. For each of these environments to be effective, it is essential for buildings to perform optimally, with plumbing and heating systems forming a core part of this.

To achieve this, specification is key.

It goes without saying that health and safety should be a primary

consideration when it comes to specifying systems for educational environments. Accommodating users of all ages, schools have to be acutely aware of protecting users from risks such as scalding, as well as diseases such as Legionnaires.

To protect people at the point of use, Thermostatic Mixing Valves (TMVs) can be installed at each outlet, ensuring water temperatures do not exceed 46°C and, therefore, do not pose a scalding risk. To provide adequate performance and meet the required standards, it is essential that TMV2-approved valves are used in educational environments, unless the users are likely to be at a higher risk of scalding such as those with disabilities or children of nursery age. In these environments, only TMV3-approved valves should be installed.

To protect users over the long-term, these valves should also be easy to access, supporting future maintenance and servicing. As well as being tested at the time of installation, these valves need to be tested at regular intervals to ensure effective operation. This interim testing should take place every six months for TMV3 valves, and every 12 months for TMV2 valves.

Schools generally have larger hot water systems and user demand is constant, therefore secondary circulating hot water systems are becoming more common to enable instant hot water at the outlets.

It is essential to thermally balance this type of system to ensure optimum efficiency from the heat source, as unbalanced

systems can create a host of problems, from inconsistent hot water availability through to creating environments for harmful bacteria to grow. Thermal Balancing Valves (TBVs) can negate these challenges. Installed at various points across a system, they can safely provide a constant and stable supply of hot water and regulate the flow of water in line with temperature.

Aside from risks such as scalding, specifiers should also adopt measures to prevent against backflow. Any building can experience backflow, where pressure fluctuations can move water in the opposite direction, subsequently contaminating the water supply. Schools are commonly defined as Fluid Category 4 and, as such, require the installation of



Interim testing should take place every six months for TMV3 valves, and every 12 months for TMV2 valves.



Thermostatic Mixing Valves (TMVs) can be installed at each outlet, ensuring water temperatures do not exceed 46°C.



Reduced Pressure Zone (RPZ) valves as standard to prevent backflow.

Future-proofing systems

Besides safety, the longevity and reliability of plumbing and heating systems is paramount for schools, enabling them to withstand heavy usage and remain functional for years to come. In practice, effective specification will help schools to maximise their budgets and deliver consistent value for all stakeholders.

Alongside protecting users from some of the common challenges associated with hot water systems, effective specification will also improve ongoing maintenance. Through effective system planning, regular maintenance and servicing can be carried out quickly and accurately, maximising lifespan and performance.

Thermal Balancing Valves (TBVs) ensure that a balanced and safe water temperature is available when and where it is needed by regulating flow rates.



 More information is available at www.rwc.com



The next step for **renewable heating**



James Chaplen, Head of Product Marketing and Communications for Mitsubishi Electric, explains why it's imperative to educate and stay abreast of new technology.

the way we heat residential and commercial buildings and maximising use of technology that heats these spaces in a more energy-efficient, renewable way is an ongoing need.

This need was moved up a notch recently when world leaders agreed at the recent COP28 to transition away from fossil fuels towards more renewable energy sources. At the same time, the UK Government is driving decarbonisation through new policies, standards and grants like the Clean Heat Market Mechanism,

the Future Homes Standard, the Boiler Upgrade Scheme, the Public Sector Decarbonisation Scheme and the Social Housing Decarbonisation Fund.

Heat pumps will play a central role in reaching the decarbonised future we need. They can provide an average of three times more energy than they consume, making them far more energy efficient and less carbon intensive than traditional fossil-fuelled boilers.

The Climate Change Committee has estimated that 19 million heat pumps will need to be installed by

2050 to help achieve current targets for Net Zero, with the number of heat pumps installed in UK homes and commercial buildings reaching record levels in 2023. Along with offering renewable heating, heat pumps can also lower running costs for both commercial and residential buildings.

This means heat pumps are rapidly becoming the first choice for building managers and owners planning renovations or new builds, as they are ideal for both retrofitting and installation in new and existing properties.

Despite all that's being done by businesses and legislators to achieve Net Zero, heating still accounts for a quarter of UK carbon emissions, so changing

Switching to low GWP refrigerants is key

Opting for systems that use refrigerants with low global warming potential (GWP) can play an important role in reducing the environmental impact of heat pumps. Newer models are being developed using these. Commercially, the Ecodan QAHV uses CO₂ and can heat water up to 90°C, and Mitsubishi Electric has recently launched its newest Ecodan heat pump, which uses R290 refrigerant and, as a result, has a GWP of only 3.

This marks a huge step towards encouraging more sustainable home heating. These kinds of heat pumps can also provide reliable heating in extreme conditions and can reach a heating temperature of 75°C in outside temperatures as low as -15°C, matching a fossil fuel boiler. This allows water to be treated to a high temperature, providing plenty of hot water to occupants.

With the cost of living continuing to rise, running the system at a lower flow temperature can result in greater overall savings and even more can be gained if solar PV panels are integrated. Of course, the lower the electricity prices become, the more efficient the system and the greater the savings for the occupant.

Systems that use refrigerants with low global warming potential (GWP) can play an important role in reducing the environmental impact of heat pumps.



World leaders agreed at the recent COP28 to transition away from fossil fuels towards more renewable energy sources.

Educating consumers

Adopting heat pump technology will help decarbonise our buildings, but public understanding of the importance of heat pump technology remains low. In fact, our research with Ipsos found that just 13% of British adults are aware of the environmental benefits heat pumps can offer, and 71% know little to nothing about how heat pump technology works. More broadly, over a third (34%) also aren't aware of the most environmentally friendly ways of heating their homes.

This is reflected in heat pump uptake. UK adoption is currently far

below the government target of 600,000 annual installations by 2028 - at circa 60,000 in 2022. To make Net Zero a reality, increasing consumer awareness and communicating the benefits of the technology will be crucial, starting with providing straightforward, impartial advice on the steps homeowners can take when making the decision to install a heat pump in their home.

If we are to reach Net Zero, moving away from fossil-fuelled boilers and towards renewable heating will be paramount. Heat pumps offer a viable solution that can decarbonise heating and ultimately build a greener future for all.



More information is available at www.les.mitsubishielectric.co.uk

Public understanding of the importance of heat pump technology remains low



How to help the UK play catch-up



Charlie Mowbray, Senior Product Manager, Ideal Heating – Commercial, discusses the dos and don'ts of achieving an efficient, future-proofed heat network.

Heat networks have never really taken hold in the UK in the same way that they have in other parts of Northern Europe, despite being a flexible, tried and tested technology used around the world for more than a century.

As other countries used the technology for safely and effectively heating buildings and generating instantaneous hot water, the UK discovered gas in the North Sea and instead placed reliance on natural

gas delivered direct to individual homes from the 1960s onwards.

Now that's all set to change. As we're all aware, the transformation of heat generation technology and products in the UK is necessary if we are to reach Net Zero in 2050, and no single type of technology will provide the solution.

Heat pumps are seen as one of the major technology types to realise our Net Zero ambitions, along with heat networks that are expected to provide up to 20% of heat in buildings by 2050.

Benefits of a heat network

Heat networks will gladly take their heat input from different sources, making them both flexible and future proof, allowing for gas boilers now but able to readily swap to lower carbon alternatives (such as heat pumps) in the future.

Heat networks are a highly scalable solution, regardless of the area covered by the network or the number of buildings. Furthermore, a single network can encompass dwellings and commercial buildings.

Unlike other types of heating, heat networks can be relatively easily retrofitted into existing properties where traditional heating appliances are being replaced.

Safety is another tick in the box for heat networks as there are no flue routes or gas connections to accommodate within a building, for either individual heating appliances or plant.

Components of a heat network

There are three core parts to a heat network: The energy centre (i.e. the central plant room), the distribution network, and the heat interface unit (HIU). The HIU is

the appliance that transfers the thermal energy from the network to provide heating and hot water for the end user.

HIUs come in indirect or direct models. Indirect HIUs typically have two heat exchangers in the appliance and provide complete separation between the heat network for both heating and hot water. Direct HIUs usually have just the one heat exchanger that may separate heating or hot water from the network. At least one of the services they provide is through a direct connection between the network and either the dwelling heating or hot water system. For example, Ideal Heating's range of POD HIUs are available in both types, with domestic hot water outputs from 30 - 70kW, and feature highly-efficient stainless steel brazed plate heat exchangers.

HIU: some key considerations

Whilst the energy centre and distribution network represent the biggest capital costs of a heat network and are the most complex to get right, the heat cannot be transferred to each dwelling/building without the HIU. To ensure the network and the HIUs are operating in harmony and at their optimum, there are aspects that an installer should consider when choosing an HIU.

First and foremost, look for a Building Engineering Services Association (BESA) tested HIU. It enables you to see how that HIU performs under specific conditions and provides independently-certified levels of performance, rather than solely relying on manufacturers' claims.

Further to this, make sure that the performance of the HIU is confirmed for the current operating parameters of your particular network now and, just as importantly, for any future operating parameters.

I say 'future' because many heat networks may currently operate with gas boilers in the energy centre and a network temperature of 70°C or higher today, but that energy centre may be designed to accommodate conversion to a low or zero carbon energy course in the future such as an air source heat pump which typically operate most efficiently at lower temperatures.

The HIU must be flexible enough to work efficiently at this lower network temperature; some cannot, which could be a costly and inconvenient mistake to rectify down the line. POD is designed to work across a broad range of primary temperatures, from 55°C upwards.

As well as BESA, the Chartered Institution of Building Services Engineers (CIBSE) has invested considerable time and expertise developing their code of practice. CIBSE CP1, Heat networks: Code of Practice for the UK, outlines examples of best practice or minimum standards that you should consider when making your selection.

Advice contained within CIBSE CP1 that I feel is particularly beneficial, and that often gets overlooked, includes design considerations for minimising the length of lateral runs in buildings from the main vertical risers, (ensuring network pipe sizing is appropriate, not oversized which leads to increased heat losses and contributes to inefficient network operation), and ensuring

that the selected HIU consistently delivers low return temperatures for the specific network operating conditions, across a range of loads.

Lastly, look at the manufacturer. What level of support do they provide, either at the front-end during design and specification of the network, or once the appliances are in service? Furthermore, always check the availability of the appliances and spares parts.

Mistakes to avoid

We see certain mistakes being repeatedly made in some aspects of heat networks and HIUs that you really should take great efforts to avoid.

Correct use of insulation is key to long term operating costs and efficiency of the network yet we keep seeing the thickness of insulation being reduced during value engineering or construction phases, probably to reduce costs. Even with the correct thickness, the standard of the installation of the insulation can have a dramatic effect on the efficiency of a network.

We've mentioned the importance of ensuring the HIU's performance range when designing and

specifying a system, including its ability to function at lower network temperatures to future proof the system. The same issues arise when it comes to the operator deciding to weather compensate the primary flow temperature from the energy centre in a bid to improve efficiency.

This normally occurs in the summer months when the heating load is reduced. If the HIUs on that network aren't designed or specified to operate with a reduced flow temperature, weather compensation can be counter-productive and the HIU may not be able to maintain the same duty for domestic hot water production, or it might cause an increased return temperature from the HIU. So, as before, take time to really consider your choice of HIUs and review the performance data.

Sticking with the temperature theme, it's very important that you don't leave a bypass open on the network, or on flushing valves before the HIUs, as this can vastly increase the return temperatures to the

energy centre and have a detrimental effect on the network efficiency.

Commissioning of the HIU is where we can encounter a number of errors, all of which can lead to increased return temperatures to the energy centre. The main offender here is a failure to check that the required differential pressure is available at the HIU.

Attention to detail

Heat Networks and Heat Interface Units are tried and tested technology, and a proven way in which we can help to decarbonise heat in buildings at scale. Ensuring that we realise the best efficiency on the networks, and provide great levels of service and thermal comfort for the occupants, requires due diligence, attention to detail both in the design and installation phases, and high quality appliances.



More information is available at
www.idealcommercialboilers.com

POD
HEAT INTERFACE UNIT

REGISTERED WITH **BESA**
BUILDING ENGINEERING SERVICES ASSOCIATION

A leaking air conditioning unit consumes almost 20% more electricity than a fully functioning one.

The long-term **effects of leaks**



Shaun Evers, Managing Director of Stonegate Instruments, explains why it's imperative to stay on top of HVAC gases.

pathogens and allergens, they improve indoor air quality.

Unfortunately, HVAC systems are also one of the largest, if not the single largest, consumer of electricity and can also pose a threat to people, profits, and the planet. Should they develop a leak, it could result in the release of toxic gases which can endanger building occupants, drive up operational costs and have a negative impact on the environment.

Harmful effects of refrigerant gas leaks

Refrigerant gas leaks often go undetected because people cannot always smell, taste or otherwise discern the presence of the gas. In fact, it is estimated that 60% of gas escapes before anyone notices, with many toxic gas leaks going unnoticed until workers start to experience symptoms of distress.

If refrigerant leaks from an HVAC system, it can rapidly evaporate into a lethal gas which can cause frostbite, chemical burns, brain damage, and even asphyxiation.

While such serious scenarios are thankfully rare, people are at risk of these and other symptoms, including eye, throat, and skin irritation, if refrigerant gases escape.

While the effect on people can range from mild to extremely serious, an undetected gas leak could also increase energy consumption, driving operational costs higher. In fact, refrigerant gas leaks are the foremost contributor to energy loss in modern HVAC stores. When a leak occurs, the system becomes inefficient and needs to work harder to maintain capacity. This in turn will increase electricity consumption and monthly bills.

Most systems leak refrigerant gases. According to the Carbon Trust, the average leakage rate in UK systems is around 20% per year. This equates to a reduction in efficiency of around 11%, which directly translates into increased energy costs.

According to several studies, a leaking air conditioning unit consumes almost 20% more electricity than a fully functioning

one and it has been suggested that a small continuous leak, left unrepaired for three months, could use an extra 10kW in electricity once the leak becomes critical.

Considering the rapid rise in energy prices, this can quickly add up to several thousand pounds.

Smart solutions ensure safety

Because refrigerant gas is both odourless and colourless, detecting a leak can be challenging. While there are several things that can be done in the case of a suspected leak, nothing can replace the accuracy and efficiency of using specially-designed technology for this task. In fact, designers and manufacturers of electronic equipment for the refrigeration and HVAC industries have worked diligently over the past few years to improve the effectiveness of refrigerant, toxic and combustible gas sensors, with modern sensors boasting greater intelligence and capabilities to combat risks posed by toxic and non-toxic gases.

With the NHS estimating that poor indoor quality costs the UK up to £20 billion a year and HVAC systems accounting for up to 40% of a building's energy usage, the importance of preventing them from developing gas leaks has never been greater.

Heating, ventilation and air conditioning (HVAC) systems are an integral part of modern commercial buildings, playing a vital role in creating safe and healthy environments. By controlling temperature, reducing humidity and eliminating airborne

Because of rapid advances in technology, the latest generation of sensors and systems are smart, self-contained, single-fixed gas sensors which are particularly suited to detecting gases associated with HVAC units. Many of these sensors have a proven return on investment of just two years, and that is without taking into consideration the cost of repairs to an existing faulty system.

Smart sensor equipment with signalling alarms, LED lights that indicate the presence and status

of each sensor, as well as audio/visual alarms to alert staff, is also available. These systems help ensure that leaks are quickly identified and repaired at the first opportunity, minimising the risk to the health and safety of building occupants and preventing breaches in regulatory compliance.

Factoring in F-gas regulations

While advancements in gas detection technology can help keep sites and workers safe, there is also an environmental aspect that cannot

be ignored. Hydrofluorocarbons (HFCs) have a global warming potential that is more than 3,000 times that of CO₂. As it gets released into the atmosphere, it causes ozone depletion and contributes to global warming.

As such, an understanding of fluorinated gas (F-Gas) regulations is vital for anyone working with refrigerant gas, especially considering that the refrigeration, air-conditioning and heat pump sector is the largest source of F-gas emissions owing to refrigerant leakage.

F-Gas regulations, which aim to phase down the CO₂ equivalent emissions from HFCs by 79% (relative to 2015) by 2030, have been in force since 2020. The regulations stipulate that equipment must be fitted with a leak detection system if it contains F-Gas equivalent to 500 tonnes of CO₂.

They have also raised the requirements for regular gas leak checks. Leakage checks should be carried out at least once every 12 months if the system contains F-gases in quantities of five tonnes of CO₂ equivalent or more, at least once every 6 months if it contains F-gases in quantities of 50 tonnes of CO₂ equivalent or more, and at least once every three months if the system contains F-gases in quantities of 500 tonnes of CO₂ equivalent or more.

Additionally, to prevent the risk of ignition posed by the flammability of some refrigerants, operators are required to maintain in-room concentration levels below the lower flammability level. This requirement is reinforced by safety legislation and standards such as ISO 5149 and EN 378.

While the UK has continued to mirror the European F-gas regulations since Brexit, the government's own assessment found that the European phase down model may be unfeasible for the UK. As discussions around F-Gas regulations continue, it is important to know that the Environment Agency has the power to impose civil penalties of up to £200,000 for various breaches, including failure to comply with provisions in the regulations or permitting another person to breach those provisions.

Benefits of gas detection technology

Whether a leak results from mechanical damage, equipment failure or poor maintenance, a gas detection system can help prevent a minor incident from becoming a crisis. In fact, gas detection systems offer many benefits. They alert building occupants to the problem, enabling them to evacuate the area and thus minimising their risk of exposure. They ensure that proper procedures are activated so that timely corrective action can be taken. They also minimise the risk of irreversible damage to equipment and prevent potentially harmful environmental impacts.

Functional and efficient HVAC systems are not only an integral part of modern buildings, they are a fundamental operational requirement. Turning to technology will ensure that, should a refrigerant gas leak occur, it is quickly identified and repaired, helping to keep energy consumption in check, minimising the risk to the health and safety of building occupants, preventing breaches in regulatory compliance, and minimising operational costs.



◀ **Equipment must be fitted with a leak detection system if it contains F-Gas equivalent to 500 tonnes of CO₂.**

▼ **It is estimated that 60% of gas escapes before anyone notices.**



More information is available at
www.stonegate-instruments.com

Keeping up with the building requirements for solar installations, and the financial incentives for stand-alone battery storage or battery and solar combos alone is an uphill battle.

Fast-tracking **low-carbon tech projects**



Karolina Younger, Chief Product Officer at Jumptech, explains how installation technology can give contractors, installers, project managers and M&E professionals more confidence to install low-carbon technology at scale.

With the increased appetite for using low-carbon technology in new and existing UK building stock, business owners, developers, energy managers and facilities managers are looking to install more heat pumps, solar panels, battery storage and EV charge points.

The UK Government's commitment to reducing greenhouse gas emissions by 100% from 1990 levels by 2050 has understandably raised the profile of low-carbon technologies. It's no longer just eco-conscious organisations that are

looking to install low-carbon tech in their facilities. The reality of net zero is driving behaviour change and is behind an explosion in demand for heat pumps, battery storage systems, solar PV panels and EV charging.

According to the Committee on Climate Change, direct emissions from non-domestic building stock accounts for almost 5% of the UK's total emissions alone. To combat such figures, there needs to be a massive ramp-up in installations, which seems to be good news for the installation industry.

Installers are in huge demand to install low carbon technologies, all of which come with their own challenges. Compound this with a shortage of skilled electrical engineers and complex, rapidly-evolving technical and regulatory landscapes, and developers and project managers potentially have a real battle on their hands. For energy and facilities managers, this

means delays and disruption to their low-carbon initiatives, risking deadlines, service level agreements (SLA) and other key targets.

As the market for installing low-carbon technologies has matured, installation specialists have had to navigate complex finance, regulation and technology environments. These are all time consuming, and they keep changing as they evolve.

Keeping up with the building requirements for solar installations, and the financial incentives for stand-alone battery storage or battery and solar combos alone is an uphill battle. Coordinating with utility companies and DNOs to obtain grid connection approvals adds more complexity. It also seems that every day brings new advancements, certainly in battery technology.

Juggling changing requirements and keeping abreast of the latest tech is a full-time job in itself.

Low-carbon installation management platforms are capable of changing this by streamlining workflows, simplifying project management, and aligning all key stakeholders for smooth-running projects that are on time and effortless.

Retrofitting means disruption

In December 2023, the UK Government opened consultation on its Future Buildings Standards, intended to establish energy efficiency, ventilation, and sustainability standards for newly built non-domestic buildings.

While this takes care of future builds, about 80% of the buildings that will be around in 2050, the timeframe for net zero, have already been built. This means facilities managers or commercial landlords will be looking to retrofit low-carbon devices and technologies in buildings not designed for them.

When it comes to retrofitting, every site is different and every installation has unique challenges. Any installation process has to be both standardised to ensure the installation company can maximise efficiency and flexible enough to allow for any changes that can and will occur.

From business parks to fleet depots, there's no doubt that installing low-carbon technologies is disruptive for most businesses. Compared to installing solar PV, batteries and especially heat pumps, EV charge point installations are a relative breeze.

Keeping stakeholders happy throughout the whole process calls for exemplary coordination and communication. With so many moving parts to a clean tech installation, installers need to be at the top of their game to keep clients happy and keep up with growing demand. As a result, many are turning to digitalised installation management platforms that guide all stakeholders, from installers to facilities managers and project developers, through the process.

Solutions for installations

Technology that supports the installation of low-carbon systems in commercial settings is revolutionising the operational efficiency of installers. Software platforms that map the installation journey have proved instrumental in streamlining field operations, strengthening communication and collaboration among different parties and empowering clients with knowledge and active participation in the process.

Such platforms offer digitised structured workflows, simplified administration processes and centralised data hubs that track vital project details and head off potential problems.

Green tech installation technology like that provided by JumpTech involves clients by prompting for key information and communicating directly on things like the installation date for equipment, who will be installing it, and what to expect.

With a comprehensive workflow of every element of the installation project, the software platform removes the risk of details being forgotten or falling through the cracks which are the very things that can derail an installation and stop facilities and project managers from keeping their low-carbon transition projects on track.

The benefits of using installation management software are felt across the whole installation experience, from the survey and quotation through to warranty registration and client onboarding and activation. A centralised management system delivers a customised approach for each work site. The platform ensures that the service delivery from the installer is consistent, while maintaining high-quality standards. A centralised system also alleviates the administrative load for project or facilities managers stemming from countless emails, phone calls, and photo exchanges, making the whole process more efficient and accurate.

Solar and battery installations are made more efficient and effective through the thorough and accurate recording of details of aspects like scaffolding requirements, roofing status, and electrical installation for comprehensive documentation. The software also guides project documentation including MCS, DNO and installation documents from the first to third fix stages, throughout the process. From a

practical perspective, installers and contractors are kept constantly 'job-ready' with visual reminders of the essential items needed for each work site. A multi-tool, multi-job app guides each trade through their tasks and collects vital on-site information. While, back at the office, quoting and invoicing efficiency is maximised by integration of accounting and operations management systems.

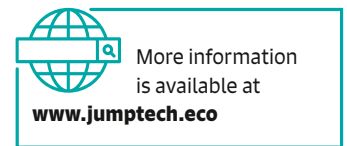
Avoid engineer return visits

In a scenario where so much can potentially go wrong, installers of low-carbon technologies need to get everything right first time, or as close to first time as possible. As the market matures, competition will grow, and margins will shrink.

What's more, with a limited talent pool of qualified electrical installation engineers, installation companies cannot afford to send engineers back to check details or fix errors that needn't have occurred in the first place. Using installation management software that keeps track of every detail and guides you through

a safe, compliant, and effective installation just makes commercial and environmental sense.

As we move towards a net zero future, there will be great opportunities for M&E professionals to transform the UK's varied commercial building stock to low-carbon technology. Those that take advantage of advanced technology will be able to do so in the most efficient and effective way, with installers, tradespeople, facilities and energy managers aligned through simple, powerful platforms.



A multi-job app can ensure a streamlined heat pump installation.



Why **early engagement** pays off



Rob Erwood, Commercial Sales and Specification Director at Baxi, looks at some of the ways manufacturers can help support the drive for net zero buildings.

factors, including available time, space and budget. Just as heating design has evolved, so too has the role of manufacturers, from single product to total solutions providers.

For this reason, engaging in conversation with manufacturers at the outset can bring multiple advantages.

Specialist knowledge

Let's consider some of the many ways in which early involvement with manufacturers can prove beneficial on a project.

First, with a full understanding of the brief, good manufacturers should be able to suggest more than one way of approaching a total solution to help you arrive at the most appropriate option. As many will offer free site surveys to evaluate the site and understand the requirements and potential challenges, it's advisable to organise this at the outset.

Manufacturers with specialist, in-depth knowledge of their products and how best to optimise their performance can be a key support during the design and installation process. Of course, for many products, an explanation might not be necessary. But on projects where

the equipment can help define and shape a solution, input from the manufacturer can play a valuable part in designing for success.

For example, when combining technologies or integrating low carbon technologies, your chosen manufacturer should be able to advise on how to achieve the most from one product without sacrificing the efficiency of another.

It's also worth asking to see exemplar designs which experienced manufacturers will often be able to provide. While each project is unique and should be designed on an individual basis, these could prove useful on more complex heating system designs. In fact, using them as an expert resource early on could save hours trawling through technical manuals, as well as associated fees.

On a practical planning level, early project discussions with manufacturers can help avoid any delays arising as a result of product availability. A good example is the recent school refurbishment programme carried out by Oakes Energy Services for The Priory Federation of Academies Trust, where nine

Remeha ASHP were to be installed across three schools in Lincoln.

Director at Oakes Energy Services, Nik Smith, said: "As with all school projects, we were working to a tight, fixed deadline. However, knowing we had the Remeha heat pumps in stock was a big selling point as this gave us more time to complete the project ahead of the start of the new term."

End-to-end solutions

A short conversation with your chosen manufacturer can also elicit useful updates on their latest advances in technologies and solutions that may be relevant to their project. For example, in addition to supplying all the components for a heating system, some manufacturers may also be able to offer prefabricated end-to-end solutions that can make the whole project simpler.

The major benefit of this approach is the time savings. From easier installation to simpler project management and logistics, it hugely reduces the potential for delay, helping to keep the project on schedule and avoiding any last-minute hitches.

With rigorous government energy efficiency and carbon targets to meet in new and existing buildings, early collaboration across the heating industry is increasingly important to achieve optimal outcomes.

As a larger energy user, the heating system is a natural focus to improve the comfort, energy performance, operational efficiency and whole life carbon emissions of a building. In recent years, design has evolved rapidly to comply with tighter building regulations. Today, a focus on low carbon design has become critical for all buildings to achieve the UK's net zero ambition.

However, there will be any number of possible design solutions for every project, with the chosen route being dependent on multiple

“The key drive behind this method was that of minimising disruption and enabling building operation at the maternity unit to keep running efficiently.”



It also enables just-in-time delivery, removing the need to store equipment on site and simplifying site management.

Early collaboration with all stakeholders, including manufacturers, is key.

On multi-occupancy building projects, the end-to-end solution could involve the manufacturer supplying the central plant for a communal heat network scheme along with plug-and-play utility cupboards containing a heat interface unit and hot water cylinder for the individual dwellings.

Prefabricated packaged plant rooms are another increasingly popular solution for use in both new and existing buildings. For example, early discussions about heat source revealed an area of expertise that a client hadn't formerly been aware of during a project for Queen Elizabeth University Hospital's Maternity Unit.

A packaged plant room was designed and built by Baxi Packaged Solutions for WGM Consulting Engineers to serve the maternity unit and during those early discussions with Baxi, its experience in providing specialist packaged plant solutions came to light.

WGM's Project Consultant Craig Gallacher said: "The key drive behind this method was that of minimising disruption and enabling building operation at the maternity unit to keep running efficiently. The packaged plant room not only looks great, but it successfully meets the immediate and longer-term project requirements."



Achieving embodied carbon targets

Net zero targets mean that specifiers and consultant engineers must increasingly evaluate the embodied carbon associated with the manufacture of a product. This includes the carbon embodied in its installation, transportation, maintenance, repair, replacement, and end of life. As a result of the high replacement rates and materials used in this equipment, embodied carbon can have a huge impact on a building's whole life carbon and help accelerate progress towards net zero buildings.

This is yet another area where discussions with manufacturers at the early stages can save valuable time later. Discovering that manufacturers provide this data will simplify the carbon calculation process significantly, making it quicker and easier for specifiers to evaluate and select equipment with lower embodied carbon.

Passivhaus Certification data

The growing requirement for more detailed product data extends to buildings built to rigorous energy efficient design standards like Passivhaus buildings, which are designed in

such a way that they require less energy to achieve comfortable conditions all year round.

While not all buildings built to this standard are certified, this is the best way to demonstrate that it meets the exemplary standards. Certification is a rigorous quality assurance compliance process that includes tests to ensure the targets are met. On projects like these, early conversations with manufacturers can be useful for exploring the most appropriate energy-efficient solutions and sourcing the relevant information for certification.

Passivhaus Designer and Associate Engineer at BakerHicks, David Coulter, said early discussions with Baxi on both these topics proved invaluable when gathering data for Riverside Primary School, Scotland's first Passivhaus-certified primary school.

"It's an exacting process," David said. "We needed to supply detailed calculations and evidence relating to the energy values of the selected technologies."

Those early conversations meant he had all the information required for certification and support at every stage of the project, David said.

Useful resource

From accompanying you on site surveys to offering any number of options for a selection of purposes, it pays to involve manufacturers at the early stages.

Manufacturers 'live' their products every day so are well placed to offer in-depth technical knowledge that can help save time and costs. They will also likely have seen a similar scenario before, along with an outcome, so can be a useful resource.

Tap into that experience. Whether you use them as a sounding board, a fresh pair of eyes, technical insight or to check product availability, it's always worth an early discussion.



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21st MARCH 2024

There are five key energy and carbon management initiatives that are set to shape business operations this year.

Five **fundamentals** for 2024



As the UK energy landscape continues to undergo major changes, Team Energy's Head of Consultancy, **Timothy Holman**, explores the crucial actions to keep an eye on over the next 12 months.

As businesses strive to be more sustainable and energy efficient, with everything from legislative compliance to carbon reduction goals pushing operations in 2024, there are five key energy and carbon management initiatives that are set to shape business operations.

Understanding and keeping abreast of these will be crucial during the next 12 months.

New additions to the Energy Savings Opportunity Scheme (ESOS)

The Energy Savings Opportunity Scheme, a pillar in the UK's commitment to energy efficiency, is continuing to evolve. With the publication of the ESOS Phase 3 consultation response, new

guidance and updated legislation, several additions have been made to the scheme.

In 2024, businesses will have to comply with the changes in compliance requirements with a sharper focus on identifying and implementing energy-saving measures.

Anyone falling into scope for the scheme one of the new, additional, mandatory requirements will need to submit an annual ESOS action plan, the first of which is due by December 5th, 2024. Additionally, organisations will now be required to report any efficiency savings made.

This will be included in the action plan which will now be made publicly available. It may be necessary to appoint a consultant to complete ESOS compliance and assist with the development of an energy saving action plan this year.

There are similarities to the Streamlined Energy and Carbon Reporting (SECR) framework, although these new ESOS reports will be much more detailed.

It is also worth noting that despite the delay to the Phase 3

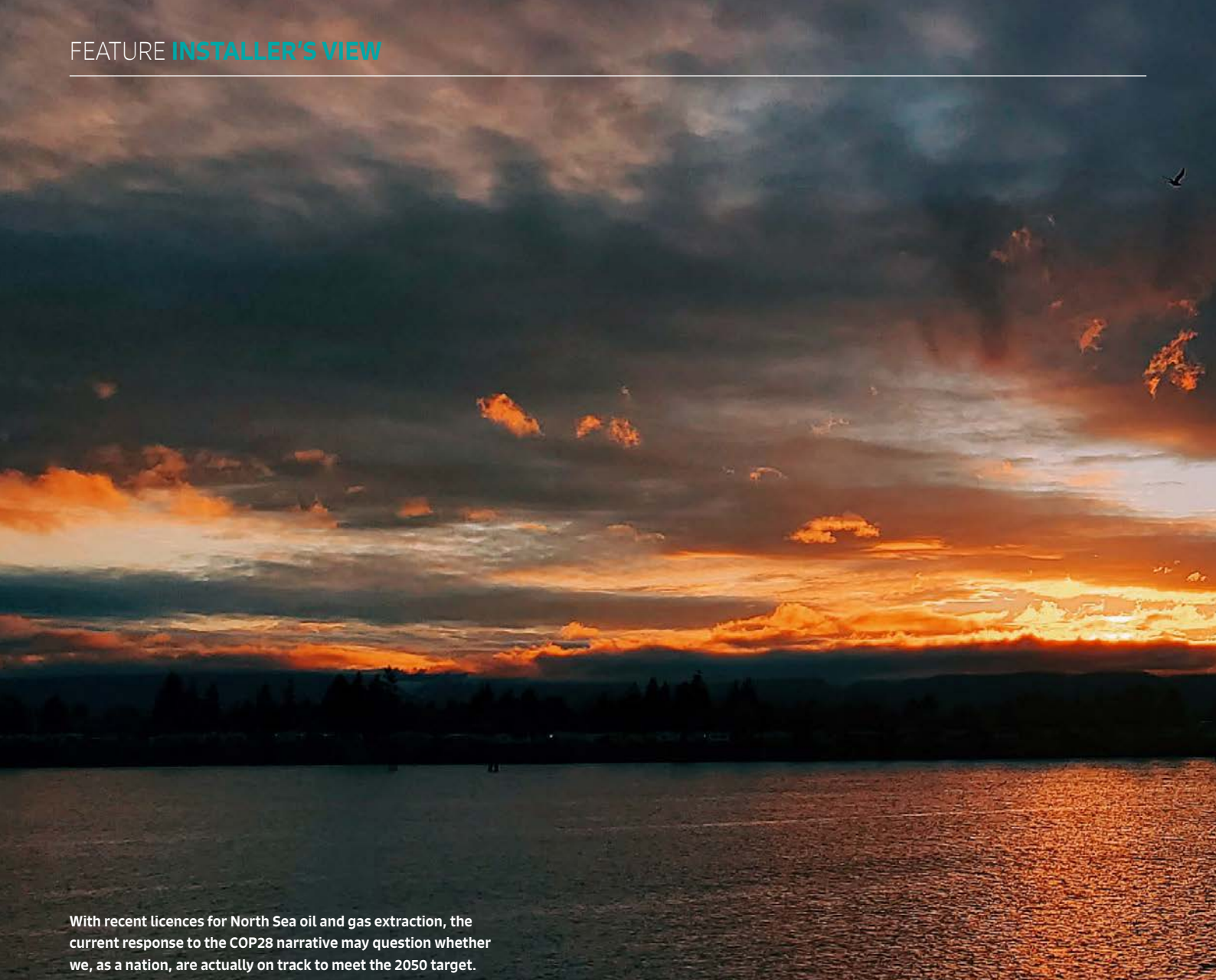
deadline, the compliance period for Phase 4 has officially started, so it's time to start thinking about building energy audits and data capture for this next phase too.

Staying abreast of ESOS developments has never been more crucial for organisations aiming to reduce their energy consumption and enhance overall sustainability.

These new elements, subject to public scrutiny, make it impossible for organisations to put ESOS to the back burner until the four-year phase deadline comes back around in 2027. ESOS will now need to be very much a part of an organisation's operations with energy efficiency progress being reported every single year. →



The NHS will be extending its Carbon Reduction Plan (CRP) requirements to cover all new procurements



With recent licences for North Sea oil and gas extraction, the current response to the COP28 narrative may question whether we, as a nation, are actually on track to meet the 2050 target.

How will COP28 impact 2024?

At the end of last year, UN climate summit COP28 took centre stage. Providing an international platform for discussions around global climate policies, emission reduction targets and collaborative initiatives, the overriding focus from many governments, campaigners and lobbyists was on whether countries could agree to phase out fossil fuels. However, after days of negotiations, the final deal called on countries to move away, rather than phase out, the use of fossil fuels.

With recent licences for North Sea oil and gas extraction, a process that allows us to mitigate the need to “import from abroad with higher embedded emissions than producing at home”, according to the Minister for Energy Security and Net Zero, Graham Stuart, the current response to the COP28 narrative may question whether we, as a nation, are actually on track to meet the 2050 target.

There were also agreements where commitments have been set to double energy-efficiency improvement rates, triple renewables by 2030, as well as to establish new standards to unlock global trade in hydrogen.

It will be interesting to see what progresses over the coming year and whether these different messages have an impact on how businesses contribute to the UK's net zero target.

Rising energy costs

Volatility around energy prices is set to continue through 2024. We already know that the domestic energy price cap has been raised 5% for this first quarter, significantly impacting energy expenditure for consumers. The impact on businesses will also be felt when renewing contracts as there is no forecasted big reduction in prices in the foreseeable future.

High energy prices are here to stay and there will be no Government subsidies to support

business this year as in 2022 and 2023, after the final support from Energy Bills Discount Scheme ends completely after March.

Proactive management of energy consumption will be a key focus for organisations looking to maintain competitiveness and financial resilience. It will be necessary to keep a close eye on energy data and establish good energy efficiency practices, particularly in these winter months, to offset higher energy costs and mitigate against any further insecurity.

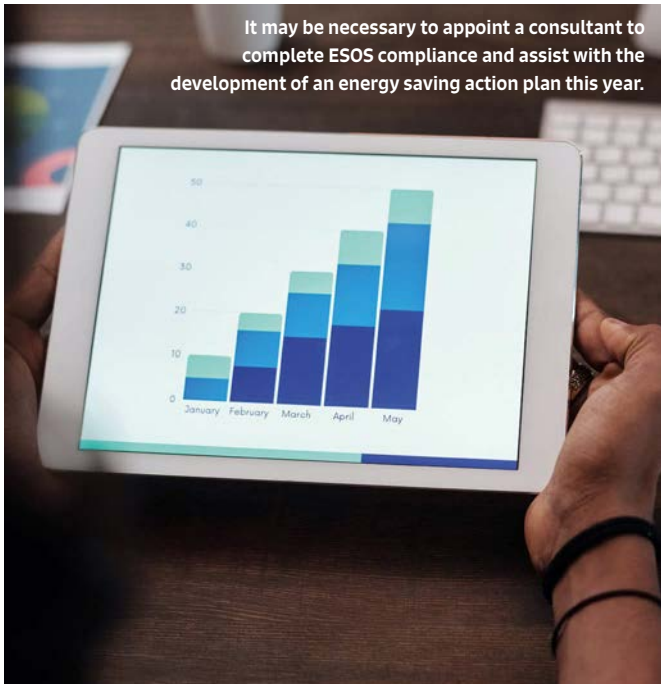
How will carbon reduction strategies and GHG reporting change?

ESOS is not the only compliance to be evolving. Currently, large organisations are required to disclose their Scope 1 and 2 emissions under the Streamlined Energy and Carbon Reporting (SECR) framework, but Scope 3 reporting is largely voluntary.

Following a consultation that closed at the end of December, which sought views on costs, benefits and practicalities of increasing Scope 3 greenhouse gas emissions reporting in the UK, we are waiting to see if this will affect how organisations manage SECR.

However, with an increasing emphasis on decarbonisation, it is important for businesses to reevaluate and strengthen their carbon reduction strategies. It is becoming harder to be part of another business' supply chain owing to tighter regulations around selling and buying to certain types of organisations and sectors.

The NHS, for example, will be extending its Carbon Reduction Plan (CRP) requirements to cover all new procurements in April, requiring all suppliers to publish their own carbon plans for Scope 1 and 2 emissions, and a subset of Scope 3 emissions before they can sell into the NHS. Businesses with a carbon reduction plan and a green



With the next general election due to take place before the end of January 2025, business energy professionals will be looking for clearer direction from the future government on energy legislation and regulations.



procurement policy will not only have more freedom in the value chain but they will be ahead of the game when further regulations come into play.

Election year

The next general election must take place before the end of January 2025, so the expectation is that it will be held within the next 12 months. Existing uncertainty and lack of clarity around energy legislation and regulations will prolong frustration amongst business energy professionals. Prime Minister Rishi Sunak promised to "set out the next stage in our ambitious environmental agenda" at COP28 last year, although this seems to have got lost in the discussions.

So, as we step closer to the UK's mandatory target of becoming net zero by 2050, it will be necessary to focus on the knowledge and information that is available within a business strategy and operational

data instead of waiting for the uncertainty to pass.

In 2024, energy management is not merely a business practice. It is a crucial driver of sustainability and resilience in the face of global challenges and potential change.

Staying informed about legislation, mitigating energy costs through energy efficiency, and building carbon reduction strategies will empower organisations to navigate the evolving energy landscape successfully.

A commitment to responsible energy management will not only contribute to reducing environmental pollution but will also position businesses' long-term success in an increasingly sustainable world.

 More information is available at www.teamenergy.com

Considered approach needed to avoid **indoor pollution**



Jason Bennett, national Business Development Manager for service partners at Zehnder Group UK explains why effective building installation is critical for ensuring occupants' wellbeing.

Ventilation technology has come a long way in the past 20 years. In the industry's infancy and in its simplest form, a ventilation system was a fan in a box. Nowadays those box fans have evolved to be sophisticated and

innovative pieces of technology that need specialist knowledge for installation and commissioning.

Digital controls, air flow calculations and zoning all need considered approaches in each building to be effective and can't just be performed by any tradesman.

But there's a lot more to it than that. Understanding the reasons behind why these products are important and the effect they have on a building and the inhabitants inside will make the installer take a different view on what it is they are fitting into a building's fabric.

To create a healthy indoor climate, the indoor air therefore needs to be refreshed to extract the pollutants that people bring into the building.



Understanding the importance of indoor air quality

The current construction mandate is to tighten all our buildings in efforts to maximise energy efficiency and build more sustainably. This is important in our drive to meet net zero targets and make buildings more airtight through the use of triple glazing, insulation and creating a more robust, sealed-up building envelope.

However, by doing this, buildings lock in polluted air and as a result risk putting occupants at severe risk of bad health. This is where an effectively-installed ventilation system comes into its own.

Making a building more airtight doesn't just stop heat from escaping. It prevents fresh airflow in and out of the property, meaning that natural ventilation and air leakage is restricted. As

a result, dangerous pollutants become trapped inside. Without means to extract and change the air, particulate matter and harmful gases (such as CO₂ and airborne chemicals) amass, creating a build-up of toxic air within the building.

Air pollution, both outdoor and indoor, is the most significant environmental health risk around today. According to the World Health Organisation, it is responsible for around one in nine deaths annually and will only get worse unless we take action to mitigate the risks.

Although air quality has gradually improved in recent times, air pollutant concentrations "still exceed the 2005 WHO air quality guideline levels in many areas" according to the WHO, meaning they are above the air quality guideline levels that are associated with important risks to public health.



Manufacturers are making significant investments to upskill the industry.



It is widely known that indoor air can contain concentrations of pollutants up to five times higher than those found outdoors, so with almost 90% of our time spent inside, it is important to realise the risks and protect against this invisible threat.

When inhaled, the pollutants that are present in the building can get into the bloodstream and travel through the body, causing serious health problems with regular exposure. Chronic exposure has been associated with respiratory diseases and aggravating existing conditions like asthma and these pollutants can also lead to cardiovascular diseases. Prolonged exposure can affect the heart and blood vessels too, causing inflammation and oxidative stress, which could potentially lead to heart disease, stroke, and high blood pressure.

To create a healthy indoor climate, the indoor air therefore needs to be refreshed to extract the pollutants that people bring into the building. Occupants are told to regularly open windows or doors in the envelope of the building to refresh the air, but of course that isn't always an option.

Furthermore, as soon as the windows are closed again, and the building is still occupied, the pollutants start rising again. Studies show that air exchange is insufficient (with the CO₂ value rising above 1000 ppm) up to 60% of the time through opening windows alone and could pose a health risk to those inside.

Opening windows and doors also means that more energy is used to keep the rooms at the desired temperature, which goes against the energy efficiency objective.

An effective ventilation system install is therefore so much more than mechanics.

Achieving the best install

Part F of the UK Building Regulations mandates the performance of ventilation systems to achieve the desired inflow of fresh air and outflow of pollutants within buildings. At present, however, Part F only sets minimum requirements for the rate of fresh airflow into a building, in other words to ensure there is a sufficient supply of fresh air to push out pollutants.

It does not stipulate requirements for how that fresh air is circulated once it is within the building envelope and that is vital for an effective ventilation strategy.

In new buildings, the installation may be more obvious and straightforward, mapped into the building at design stage, leaving ample room for access, ducting and maintenance in the future.

However, when it comes to providing ventilation for older buildings, there are many more challenges to be faced. Unlike new builds, where ventilation requirements are specified to building regulations and mapped into the building system design, older buildings can be far less flexible and often the original purpose of the space needs to be a consideration for any new technology installation. →

Be it a new build or building refurbishment, the correct installation of the ventilation system is essential. The results of a poor install can have serious detrimental effects on a building's fabric, causing condensation issues that can lead to toxic black mould, excessive use of energy that drives up the running costs of a building and, most alarmingly, pose a health risk for the occupants inside through poor indoor air quality.

Bad airflow through a building also has a profound effect on overall occupant wellbeing as a result of extreme noise levels of the pressure through the ducting.

Yet we are seeing that this is happening across the industry and are finding all manner of tradesman, from pipework engineers to electricians, trying to install and commission ventilation products.

This is largely down to a significant skills gap within the industry. There are simply not enough specialist M&E contractors who are ventilation qualified and can do the job. If there was a true understanding of the impact of a bad install across the industry, the resulting benefits would be substantial.

With building regulations now putting more emphasis on ventilation performance and energy efficiency, a good understanding of ventilation practices has never been more important to provide a quantitative basis for designing, monitoring, and optimising ventilation systems, thereby contributing to efficient



An effectively-installed ventilation system is critical to the wellbeing of a building's occupants.

and effective operation in various industrial, commercial, and residential applications.

Without this knowledge and a good understanding of the building regulations for ventilation, the industry is falling short; with engineers who lack practical experience being made responsible for installing these complex systems.

Manufacturers are therefore making significant investments to upskill the industry and design units and components that make the install easier and more time efficient.

For example, solutions such as the Zehnder RapidLock connection clip for semi-rigid ducting can make installs quicker and easier for the technician while ensuring a secure, airtight connection across the air distribution system from the manifold to the grille housing. In fact, it can make the process three times faster for installation per household.

The purpose of such solutions is to remove complexity for installers and eliminate the need for grappling with metal clips, greasing gaskets or relying on

bayonet sockets, even when ducting is rotated 90 degrees. A tight seal can be made in seconds and installers can confidently move onto the next task, knowing that the system is locked and working efficiently to protect the wellbeing of inhabitants in that building.

These streamlining solutions aid engineers in the installation process, enhancing opportunity for swift commissioning and hassle-free maintenance and cutting down the time on site. They also prevent problematic and unnecessary errors, such as damaged ducting, bad alignment or air vent leakage that are often mistaken as system faults rather than installation error. All of these can lead to various issues such as increased energy consumption, disruptive noise, reduced indoor air quality and uneven airflow.

At the end of the day, if installers can truly understand why indoor air quality and an effective ventilation system is essential for every building, they'll ensure a best-in-class job every time.

If there is a true understanding of the impact of install across the industry, the resulting benefits will be substantial.



 More information is available at www.zehnder.co.uk

Exi-tite develops heat pump packaged system for potable hot water

HVAC equipment supplier Exi-tite has developed a self-contained potable hot water system using the latest heat pump technology with AI capabilities.

The packaged system can be installed as a permanent fixture or mobile 'plug-in' solution across various applications such as offices, hotels and student accommodation, with heating capacities ranging between 13kW and 240kW and low-GWP refrigerant options.

Prefabricated off-site, it is constructed on a structural framework and designed to be wheeled or crane-lifted into position.

Managing Director of Exi-tite, Andrew Robinson, said: "Heat pumps are being used increasingly for space heating and potable hot water, but the feedback from consultants and M&E contractors has been that, when installed incorrectly, they became an expensive problem. We have managed to navigate around the majority of on-site issues and found a solution that provides peace of mind."

LG VRF heat pumps provide modular capacity control and redundancy, and are inverter-driven with both latent and sensible load monitoring. Each Multi V i system is connected to a high-temperature hydro kit, capable of producing water temperatures up to 80°C and provide 100% heating capacity down to -7°C, reducing the increase in capital costs associated with oversizing equipment to accommodate typical losses.

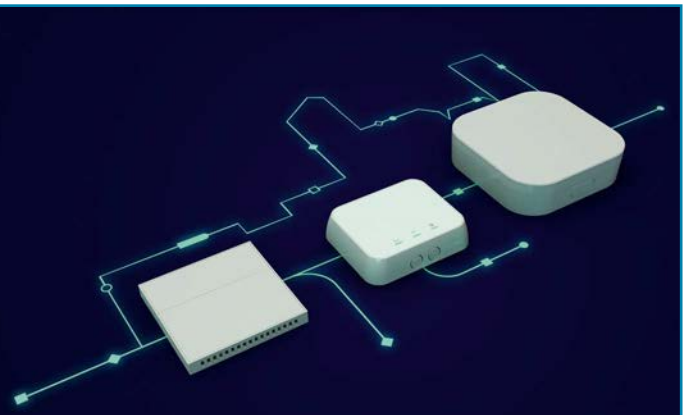
Group Sales Director at Exi-tite, Mark Brown, said: "Our first packaged hot water system has just been delivered to a project in Leeds and has been designed to provide 100kW capacity split into four 25kW stages. We have provided a 1650-litre energy bank and can provide 1800 l/hr of usable potable water, raising from a mains cold supply to 60°C with a 7-minute recovery time of the energy bank.

"We chose LG Multi V i heat pumps because they offer an enhanced corrosion resistance coating and continuous heating operating without entering a complete defrost. This means that hot water production is always available, which is a significant requirement from our customers."

The method of hot water generation differs from typical systems that store potable water. When storing water, pasteurisation is required as a legionella prevention method and this typically impacts the system's operating efficiency, and requires additional control strategies. Because the packaged Exi-tite system heats cold mains water directly through a heat exchanger without storage, pasteurisation is unnecessary and the need for salt-based softeners is also eliminated.

The system is plug-and-play, arriving with its own localised control, but is also pre-wired for connection to a building management system and pre-piped with connections to the cold water main, hot water supply and optional circulation loop.

sales@exi-tite.com



Launch of new wireless BMS sensors brings advantages to changing building landscape

Siemens has introduced three new wireless room sensors as part of its ongoing development of the company's expanding IoT range.

Wireless technology has moved on significantly in recent years and is once again starting to become a popular option in building management systems (BMS), offering several advantages over conventional wired technologies. The introduction of the wireless, battery-operated sensors enables quick and easy installation to provide important monitoring of indoor air quality (IAQ), with 3 options available: temperature only; temperature and relative humidity; temperature, relative humidity and CO₂.

With CO₂ being an excellent indicator of IAQ, this new sensor offers a measurement accuracy of +/-2%. For those requiring monitoring of all three variables, the three sensors are housed in a single unit, with a temperature range of 0°C - 50°C, a humidity range of 0% - 100% and a CO₂ concentration range of zero to 5,000ppm.

Open interfaces are key in enabling more intelligent room devices and building solutions. The new sensors communicate wirelessly through Thread, an open source, mesh networking, IP-based protocol, meaning they operate seamlessly, either with Siemens own BMS, such as the popular Desigo system, or with those of other manufacturers. Thread's low power consumption, spread-spectrum techniques provide immunity to interference, while its self-healing properties avoid a single point of failure. This enables automated control of IAQ, with, for example, the sensor triggering increased ventilation when a predetermined CO₂ level is detected, even if a router fails.

The new sensors have been three years in development and are being launched at an opportune time. With buildings being repurposed and offices being reconfigured in light of the changing building landscape post-COVID, the capability to easily relocate the sensors to meet new requirements without damaging walls and ceilings through re-wiring is a particular advantage. Aesthetics are further addressed through the slim new design and easy mounting options (wall, flush or tape mounting).

www.siemens.co.uk

Kooltherm pipe insulation on target at Wembley Park

The 633 apartments at Madison, Quintain's 85-acre Wembley Park development, are all connected to a district heating network with secondary pipework insulated using Kingspan Kooltherm pipe insulation.

Kooltherm Pipe Insulation was installed on secondary LTHW pipework across the development. With a thermal conductivity as low as 0.025 W/mK, it offers one of the thinnest and most thermally-efficient solutions for insulating pipework. Specifiers and contractors are able to limit heat losses when insulating secondary pipework to the minimum insulation thicknesses in table 8 of Objective 3.9 of CIBSE CP1 Heat Networks Code of Practice or to easily meet the new enhanced targets within BS 5422:2023.

www.kingspantechinsulation.co.uk



New high rise flue kits from keston provide uncomplicated compliance

Keston's new stainless-steel High-Rise Flue Kit provides a simple and compliant solution for high-rise buildings.

Suitable for all buildings in England and Wales higher than 18 metres, the kit is fully compliant with the latest building regulations and is suitable for installations in Scotland above 11 metres.

Made from 316 stainless steel, it offers a corrosion-resistant alternative to other non-combustible or fire-resistant materials. It is compatible with the Keston Combi 2 and System 2 boiler ranges. Containing an air outlet and flue terminal, each kit also contains fittings and thread sealant.

www.keston.co.uk

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Nuaire expands Xboxer heat recovery range

Nuaire has expanded its Xboxer heat recovery range with the addition of the UNI-X unit, which has now been rebranded to Xboxer Universal.

Its construction and performance retain the quality that has made it so popular in schools, hospitals, offices, care homes, and apartments with high efficiencies, low SEPs and ultra-low noise levels. The latter is a result of the Xboxer Universal's unique casing consisting of internal profiling and external acoustic cladding.

Xboxer Universal is available in three models, UNIX-220, UNIX-360 and UNIX-580, with the largest model having enough duty to ventilate a cluster of up to 12 rooms. The three speed controls are included as a standard feature. Each size is equipped with an integral mounting bracket and multiple spigot options are available.

The UNI-X580 will enable sites to ventilate a large cluster of rooms with just one system. Innovative space saving solutions mean the unit needs a maximum depth of 295mm, enabling it to fit neatly into low ceiling voids. Once installed, the unit is easy to maintain with the G3 filter accessible from the underside of the unit.

The Xboxer Universal range is enhanced by Nuaire's in-line carbon filter range, IAQ-BOX, which filters out up to 99.5% of harmful NO2 and up to 80% of Particulate Matter (PM). Nuaire's all-in-one thermal ducting range, Ductmaster Thermal, can also be specified to improve thermal efficiency and reduce installation time.

Xboxer Universal is the latest addition to Nuaire's Xboxer family whose combination of innovative design, flexible control options and high efficiency, make it an award winning, market-leading heat recovery solution. Other units in the range include Xboxer Hybrid, which combines pure natural ventilation with mechanical assistance; and Xboxer XBC+ which has the lowest depth by duty unit on the market, for a space saving solution. All are designed to filter clean air into a building whilst extracting stale air from the interior, retaining heat that would otherwise be lost.

Established in 1966, and based in Caerphilly, Nuaire designs and manufactures practical solutions for all ventilation requirements across the domestic, commercial and industrial construction sectors. Nuaire has a reputation for pioneering new air technology supported by high-quality units.

www.nuaire.co.uk



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