November 2025
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cibse Journal

CPD Special

Three new CPDs:

Optimising HIUs and substations

Chemical-free water in closed-loop systems

Airflow measurement in healthcare facilities

Lifelong learning

The complete list of CIBSE CPD suppliers

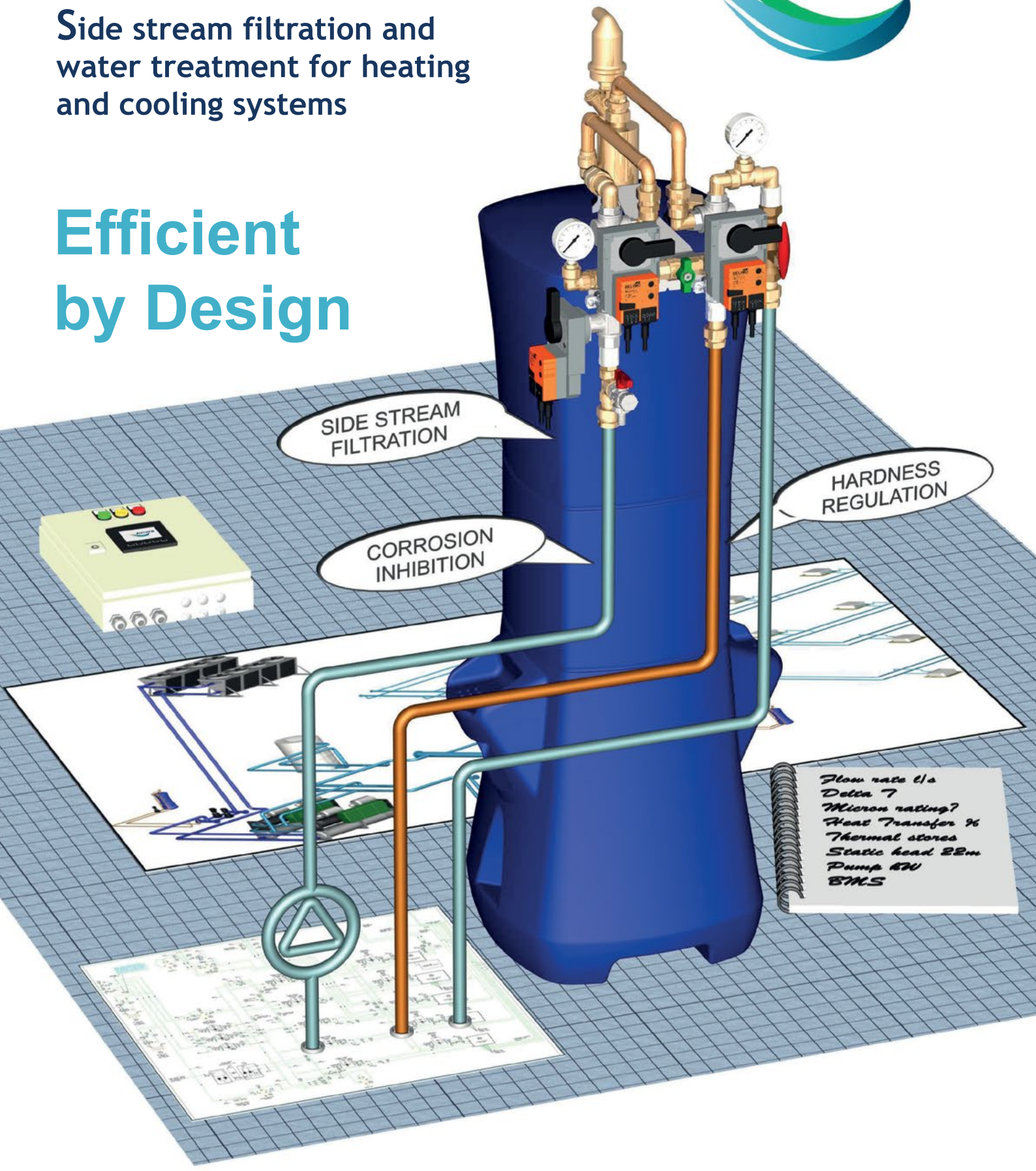
ADVANCED WATER TECHNOLOGY

enwa

EnwaMatic®

Side stream filtration and water treatment for heating and cooling systems

Efficient by Design



ENWA WATER TECHNOLOGY 01530 830 354 uksales@enwa.com www.enwa.com

Commitment to learning

A few weeks ago, I jumped out of an aeroplane into the beautiful sunset skies of Suffolk, in aid of St Elizabeth Hospice, for which I raised more than £500. The experience made every cell in my body feel alive, and the views over Southwold and the coastline were jaw-dropping. Although this activity was perceived as being dangerous, a serious accident was more likely to have occurred on the long drive from my home to the airfield.

That skydive was a calculated risk, one that required me to place trust in the parachute, instructor and the aircraft. It reminded me that, in our profession, we take calculated risks every day.

Whether designing mechanical systems, specifying materials or designing to current fire regulations, our decisions carry weight. Unlike my jump, however, the risks we manage in the built environment affect not just ourselves, but the lives and wellbeing of countless others who will spend time in the buildings we design and construct.

This is why our commitment to building safety and sustainability must remain unwavering. These aren't just regulatory checkboxes – they're moral imperatives. As engineers, we must continually sharpen our knowledge and challenge our assumptions. That's exactly what this CPD supplement is here to support: structured learning that empowers us to make safer, smarter and more sustainable choices.

Remember, we introduced the mandatory subjects – one for building safety and one in sustainability – to ensure our members provide more energy efficient designs and stay informed about the latest safety technology and legislation. This remains especially pertinent with the introduction of the Building Safety Act. That's why this year's CPD audits will require logs to evidence these two (as a minimum) semi-structured activity subjects.

I'm pleased to share that we've seen a 10% uplift in the number of CPD presentations approved for use by our suppliers, an encouraging sign of growing engagement and commitment to professional development. Keep an eye out for the CIBSE seal of approval at future seminars – and be sure to log your attendance in your CPD record.

CIBSE Journal also has more than 250 CPD modules, plus a host of webinars, available to view on demand at **www.cibsejournal.com/cpd** In addition, CIBSE's Grow Your Knowledge webinars are available at **www.cibse.org/growyourknowledge**

Finally, there is a huge variety of CPD events across all of CIBSE's Groups, Regions and Societies, available at **www.cibse.org/events** ●

● **Stephen Page MCIBSE, CIBSE CPD panel chair**

Supplement
www.cibsejournal.com
#Build2Perform

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Contents

***CIBSE Journal* has more than 200 CPD modules available to complete at www.cibsejournal.com Our website makes it easier than ever to continue your professional learning online**

CIBSE CPD Directory

This directory lists all the accredited organisations providing modules on a range of areas, including electrical, fire, lighting and sustainability

All the CPD courses in this directory have been approved by CIBSE. They are reviewed and assessed to ensure that the technical content is of a high standard and offers valuable CPD to delegates.

The directory of CPD course providers has been compiled to assist members of the Institution in identifying suitable courses in respect of their CPD needs. It embraces many different areas suitable for CPD, and will continue to be updated to incorporate new entries and revisions.

CIBSE members are required by the Code of Professional Conduct to maintain professional competence, but this should also apply to any professional working in the industry.

The directory will help you find suitable CPD to assist with your ongoing career development.

For guidance on what constitutes different CPD activities and how to record CPD, visit **www.cibse.org/cpd**

Here you will find CIBSE's online portal – mycareerpath – which lets you record your CPD in one place and link your progress to set objectives.

ACV

ACV BY IDEAL HEATING

● Phone: 01383 820100
Email: uk.sales@acvuk.com
Web: acv.com/gb

ACV has been designing, developing, manufacturing and distributing hot-water and heating products for commercial and residential heating since 1922.

It specialises in stainless-steel products and is the home of the patented tank-in-tank concept, which gives a safe, clean and reliable domestic hot-water performance to match the largest of demands.

Our CPDs, listed here, can be delivered in person or online.

- ***Factors driving material selection for hot-water storage products.***
- ***Decarbonisation using electric boiler technology in non-domestic properties.***
- ***What you need to know: commercial DHW systems now and for the future.***

AIC Heating UK

aic

● Phone: 0300 303 4169
Email: sales@myaic.co.uk
Web: myaic.co.uk

AIC Heating UK's extended range of Aurax reversible commercial heat pumps has outputs from 21kW to 710kW, and uses low global warming potential refrigerants R454B and R290. The company also offers bespoke heat pumps up to 1,200kW.

Not all buildings can be easily switched to renewables, so AIC offers an intelligent hybrid solution that combines the reliability of traditional heating and hot water with an enhanced renewable element. The company specialises in stainless steel, and has designed and manufactured a complete range of commercial gas-heating and hot-water products ranging from 24–1,260kW output from a single boiler, which can be cascaded for higher output projects. The Fire Tube heat exchanger ensures high efficiency and reliability, achieving NOx class 6 and a high modulation ratio up to 10:1. AIC also manufactures fully stainless-steel hydraulic cascade systems up to 900kW.

We offer a full CPD discussing the benefits of using stainless steel in our products, as well as the efficiency of our patented Fire Tube heat exchanger technology. We can deliver the CPD in person, at your offices, or virtually.

Airedale by Modine

● Phone: 0113 2391000
Email: connect@airedale.com
Web: airedale.com

Critical cooling specialist Airedale by Modine has the technology and expertise to meet the specific operational demands of data centres, as well as healthcare, pharmaceutical and telecoms industries. Its hybrid cooling solutions encompass high-efficiency air- and liquid-cooling systems, intelligent controls software and comprehensive aftersales support.

The company's wide selection of CIBSE-approved CPD courses (below) are free of charge, can be delivered in person or as a webinar, and can be tailored to specific needs.

- ***Data centre chillers.***
- ***Optimising data centre cooling system performance using dedicated controls platforms.***
- ***Liquid cooling – Level I: Application and technology.***
- ***Liquid Cooling – Level II: Hybrid data centres.***
- ***F-gas Level 1 (Legislation and A2Ls).***
- ***F-gas Level 2 (Global implications and alternative refrigerants).***
- ***Ecodesign: chillers and Tier 2.***
- ***Heat pumps – Level I: An introduction.***
- ***Heat pumps – Level II: Simultaneous heat pumps.***
- ***HTM 03-01 (2021) – Revised guidelines.***
- ***R290 propane.***

Altecnic

● Phone: 01785 218200
Email: marketing@altecnic.co.uk
Web: bit.ly/altecniccpd

Altecnic, part of the Caleffi Group, is the UK's leading provider of hydronic solutions for commercial and domestic applications, setting the standard for trade merchants, original equipment manufacturers, engineers and specifiers.

The Altecnic Academy is an innovative online learning platform designed specifically for professionals in the plumbing and heating industry. It offers a range of e-learning courses focused on essential industry topics.

The Academy provides invaluable, on-demand access to relevant training, helping professionals to stay informed and up to date.

We offer CIBSE-accredited CPD courses, including:

- ***Dirt and air in commercial systems***
- ***UK certification schemes***
- ***Efficient system design using electronic heat interface units (HIUs)***
- ***Modern solutions for domestic water services.***

Email us to book face-to-face CPD courses.

Andel

● Phone: 01484 845 000
Email: help@andel.co.uk
Web: andel.com

Since 1992, Andel has been protecting organisations with its innovative leak-detection solutions that prevent costly damage, downtime and environmental risk.

The company is proud to share its expertise through CIBSE-certified CPD seminars, which offer practical, real-world guidance on leak-detection technologies.

Its seminars on liquid leak detection and gas leak detection are designed to equip professionals with the knowledge to specify and apply best-practice systems confidently across new-build and retrofit projects.

Delivered by senior members of Andel's specialist team, the seminars – which are suitable for technical and non-technical audiences – are free to attend and can be held via Microsoft Teams, at your office or at Andel HQ.

The one-hour sessions count towards the 25-hour annual CPD requirement for consulting engineers, and include a:

- Dynamic mix of presentations, Q&A and hands-on demonstrations
- Certificate of attendance and copy of the presentation for all delegates
- A light lunch for in-person sessions.

Armacell

● Phone: 0161 287 7000
Email: technical.uk@armacell.com
Web: armacell.com

Armacell UK offers CIBSE-approved lunchtime learning seminars for mechanical service engineers. Courses are held at engineers' offices and training options include:

- ***Mechanical services insulation*** – a review of insulation for HVAC-R pipe and ductwork and equipment, looking at key considerations when specifying, including fire performance, energy saving and thermal efficiency.
- ***Building Regulations and environmental design*** – a review of the regulations and standards governing pipe and duct insulation, plus an introduction to environmental considerations and assessment methods when specifying thermal insulation materials.
- ***Protection against corrosion*** – corrosion prevention and the benefits of Flexible Elastomeric Foam insulation.
- ***Acoustic insulation of building services*** – ways to control noise in building services, including from process pipework, waste and drainage pipes, and ductwork and their associated equipment.
- ***Passive fire protection of building services*** – products to protect wall and floor penetrations, the correct testing and certification of these products, and the best system solutions for different applications.

Armstrong Fluid Technology

● **Phone: 0161 223 2223**
Email: ukhvacsales@armstrongfluidtechnology.com
Web: armstrongfluidtechnology.com

Armstrong Fluid Technology is a leading global player in HVAC. It designs and manufactures innovative fluid flow equipment and high-efficiency energy solutions for a broad range of applications, including district energy, data centres, fire systems, gas transmissions, high-rise, and mixed commercial buildings.

The firm's solutions deliver optimum lifetime building performance with the lowest first cost and life cost. Armstrong is committed to helping building owners, consultants, specifiers and energy managers find low-cost solutions for reducing energy consumption and carbon emissions. Its expertise comes from an understanding of end-to-end fluid systems and the integration of fluid dynamics, heat transfer, variable speed, and demand-based controls, which is the focus of its CIBSE-approved CPDs:

- ***A whole-life sustainable approach to pump and equipment selection without compromising on redundancy.***
- ***Meeting the needs of the building life-cycle through innovative approaches to variable speed pumping.***
- ***Pump basics and variable speed pumping.***
- ***Why district energy? Guaranteeing performance and where it is heading.***

The company can provide free, one-hour 'lunch and learn' sessions at your offices or at any of its UK sites.

Baxi Commercial

● **Phone: 0330 678 0140**
● **Web: baxi.co.uk**

Baxi Commercial offers free, CIBSE-accredited CPD seminars to help building services professionals – whether they are consultants, specifiers, contractors or facilities managers – to expand their knowledge while meeting essential professional development requirements.

Delivered by our expert team, each seminar lasts around one hour and can be held online, via Microsoft Teams, or in person at your offices. Sessions include opportunities for discussions and Q&A sessions, ensuring content is relevant to overcoming real-world challenges.

Our current CPD programme (right) covers three areas shaping the future of commercial heating and hot water.

- ***Heat networks*** – exploring the growth of heat networks, system zoning, HIU standards, and the regulatory landscape, including the Energy Act 2023.
- ***Hybrid systems and air source heat pumps*** – giving practical insight into decarbonisation strategies, optioneering and feasibility studies.
- ***Hot-water generation*** – reviewing direct, indirect, instantaneous and storage systems, with guidance on life-cycle efficiency, system design and low carbon integration.

Belimo

● **Email: sales@belimo.co.uk**
Web: belimo.com/uk

Belimo is the global market leader in the development, production and sales of field devices for the energy-efficient control of heating, ventilation and air conditioning systems. The focus of our core business is on damper actuators, control valves, sensors and meters.

We offer a range of CIBSE-accredited CPDs to develop further knowledge on HVAC and fire and smoke products. All our speakers are highly experienced in their specialist fields; many having spent 20-30+ years in the HVAC controls industry.

CPD seminars can be held online or at a company's premises, or at the Belimo Customer Experience Centre at our Shepperton offices.

- ***Fire dampers in HVAC systems.***
- ***Improving performance; saving energy in heating; cooling systems.***
- ***Evolution of pressure independent control valves.***
- ***Sensors in HVAC systems.***

Biddle Air Systems

● **Phone: 02476 384233**
Email: sales@biddle-air.co.uk
Web:biddle-air.co.uk

Biddle Air Systems delivers advanced air curtains and fan coil units (FCUs), plus tailored heating technologies, and works with consultants and contractors to design systems that optimise energy use, support decarbonisation and align with net zero objectives. Its solutions balance performance, compliance and long-term value, to create safe, comfortable and efficient environments across multiple sectors.

Biddle's CIBSE-accredited CPDs (below) aim to equip building professionals to design and specify climate-control solutions that meet and exceed sustainability challenges.

- ***Air curtains technology*** – explores climate separation, airflow and temperature control in commercial and industrial buildings. It shows how air curtains improve energy efficiency, comfort and indoor air quality while reducing heat loss, humidity issues and contaminants. Covers design, installation and performance optimisation.
- ***Fan coil units technology*** – this CPD explains the design, application and performance of FCUs across commercial and residential environments. It covers system configurations, energy efficiency, noise control, condensate management and controls integration, and provides practical guidance on specification, installation and maintenance.

BPC Energy

● **Phone: 01794 521 200**
Email: Sales@bpc-ups.com
Web: bpc-ups.com

BPC Energy's CPD titles include:

- ***Reliability in critical power supplies*** – examines widely used measures of reliability and suggests alternatives for assessing and quantifying failure modes and their associated risks.
- ***Emergency lighting systems*** – an introduction to the regulatory framework and standards. It compares 'self-contained' and 'central power supply (CPS)' systems, and explains the impact of various lighting loads. It also discusses the differences between UPS and CPS.
- ***The modular revolution*** – examines traditional solutions for ensuring continuity of power to critical loads, and considers the alternatives offered by modular systems.
- ***Battery fusing in power-conversion applications*** – of interest to consultants and engineers who purchase or specify UPS, emergency lighting static inverters and central battery systems, photovoltaic systems, electric vehicle charging solutions and battery storage systems.
- ***Medical isolated power supplies*** – examines the requirements for the supply of power to various levels of medical locations – particularly 'Group 2' locations – as defined in Section 710 of BS 7672:2018. Concludes with a Q&A session.

Condair

● **Phone: 01903 850200**
Email: uk.sales@condair.com
Web: condair.co.uk/CPD

Manufacturer of commercial and industrial humidity control systems, Condair is offering three CIBSE-approved CPD training sessions – either face to face, in a client's office, or via an online presentation.

The three CPD seminars are:

- ***Humidification and psychrometrics*** – offering an overview of humidification, an explanation of psychrometric calculations, and detailed analysis of humidifier product selection, demonstrating the pros and cons of each technology.
- ***Dehumidification and drying psychrometrics*** – covering dehumidification processes and calculations using a psychrometric chart; an explanation of dehumidifier types and technologies; product selection and sizing information; and a comparison of different technologies.
- ***Using humidifiers for evaporative cooling in AHUs*** – learn the psychrometrics of evaporative cooling, the benefits and limitations of using evaporative cooling in AHUs, and the three main AHU evaporative cooling strategies. Also analyse the energy consumption figures behind three real-life case studies, and compare the different technologies available.

Cooltherm

● **Phone: 01179 610006**
Email: enquiries@cooltherm.co.uk
Web: cooltherm.co.uk

Cooltherm specialises in innovative, energy-efficient cooling and heating solutions, delivering high-performance HVAC systems across commercial, industrial and specialist sectors. It offers a range of services, including the design, supply, installation, service and maintenance of chillers, heat pumps and air conditioning systems.

Over the past 40 years, refrigerants have come under increasing scrutiny because of their environmental impact, particularly their global warming potential (GWP).

Cooltherm's CPD, ***Navigating refrigerant legislation and restrictions***, explores the environmental and regulatory challenges facing HVAC professionals today. Tailored for building services engineers and consultants, it provides a detailed overview of existing and emerging UK and EU legislation, including F-gas regulations and upcoming restrictions to phase down high-GWP refrigerants.

The CPD also highlights practical implications for system design, and the low-GWP alternatives available to ensure ongoing compliance and environmental responsibility.

With clear technical insight into a complex and evolving area, Cooltherm's CPD aims to support informed decision-making and future-proof HVAC strategies aligned with sustainability goals.

Crane Fluid Systems

● **Phone: 07713781806**
Email: ngibson@cranebsu.com
Web: cranefs.com

Crane Fluid Systems provides dynamic control valves, alongside general valves, for chilled heating and domestic services. CPDs include:

- ***Proportional balancing*** – within the commissioning process. Applies to constant and variable flow heating and chilled water systems.
- ***Thermal circulation valves – protection against legionella*** – eliminating legionella pneumophila, which causes Legionnaires' disease, from domestic hot-water systems. Covers high-risk systems, growth considerations, and counteractive processes and measures that can be implemented – primarily thermal circulation valves.
- ***Variable volume system using differential pressure control valves (DPCVs)*** – covers application, selection and commissioning.
- ***Variable volume system using pressure independent control valves (PICVs)*** – covers application, selection and commissioning.
- ***Variable volume system using DPCVs and PICVs*** – a combination of the above two modules.
- ***Digitising hydronics*** – the relationship between BMS and smart buildings and hydronic control/balancing. Understanding Modbus/BACnet communication to achieve remote commissioning, delta T monitoring, and control and data analytics.

Daikin Applied

DAIKIN APPLIED (UK) LTD

● **Phone: 0345 565 2700**
Email: info@daikinapplied.uk
Web: daikinapplied.uk/cpd

Daikin Applied UK (formerly McQuay UK Ltd) is the market leader in energy-efficient air handling units (AHU), chillers and heat pumps. It specialises in large-scale, bespoke projects, ranging from data centres and hospitals to pharmaceutical facilities and process cooling.

Daikin's CPDs are relevant, up to date and technical, and can take place at your chosen premises or virtually. They include:

- ***Optimising AHU design for energy efficiency and carbon footprint***
- ***Heat pumps and chiller market trends – CIBSE-approved***
- ***Air handling unit compliance to HTM-03-01 (2021) – CIBSE-approved***
- ***The benefits of air handling unit refurbishment in healthcare facilities – CIBSE-approved***
- ***Virtual factory tours of our European chiller, inverter and AHU factories.***

DMS

DMS METERING SOLUTIONS 25 YEARS

● **To book your CPD session, scan the QR code**

DMS, the UK's leading supplier of metering solutions, offers two CIBSE-approved CPD courses to enhance your professional knowledge and skills.

- ***Heat metering: technology selection and getting it right first time*** – this course provides a comprehensive overview of heat-metering technologies, focusing on selecting the appropriate equipment for various applications. Topics include technology selection, application and installation, power, display, and communication options.
- ***Understanding meter data collection*** – recognising the growing importance of data in energy management, this course delves into effective methods of collecting and interpreting energy data. Participants will explore manual and automated data-collection systems, Internet of Things integration, and best practices for data security and system maintenance. This training is particularly relevant in the context of the digital transformation in the energy sector.

Both courses are available online or in person. In-person sessions include lunch, providing an opportunity for networking and knowledge sharing. Upon completion, participants receive a CPD certificate.

Dutypoint

DUTYPOINT

● **Phone: 01452 300110**
Email: Marketing@dutypoint.com
Web: dutypoint.com/knowledge-point/training

Dutypoint, a leading innovator in fluid-technology solutions, offers a series of CIBSE-approved CPD seminars designed to empower building services professionals with technical expertise and practical knowledge. These include:

- ***Cold-water boosters*** – covering correct system sizing and selection, ensuring reliable water supply performance across diverse applications.
- ***Category 5 backflow prevention*** – exploring fluid categories, real-world applications, and effective prevention solutions to ensure compliance and protect public health.
- ***Fire sprinkler pump sets*** – detailing British Standards, the importance of sprinkler installations, and the range of pump-set options available to meet project requirements.
- ***Offsite packaged plantrooms*** – highlighting the advantages of offsite construction, from design control to reduced installation risks, while also addressing warranty, commissioning and integration considerations.

Delivered by Dutypoint's expert technical team, these CPDs can be delivered at the company's dedicated training rooms, in your own offices, or online.

EnerSys

EnerSys® Power/Full Solutions

● **Email: kelly.stapleton@uk.enersys.com**

Most data centre operators focus on servers, cooling and connectivity when planning for uptime. However, industry analysis shows that battery systems are often the silent cause of costly outages.

The *Uptime Intelligence Annual Outage Analysis 2024* reports that 16% of data centres experienced outages last year, costing more than US$1m, several of which were linked to preventable battery issues.

EnerSys's CIBSE-accredited CPD course helps engineers and facilities managers identify and address risks before they become failures. The in-person 'lunch and learn' session, led by an industry professional, combines practical guidance and technical insight with real-world examples to uncover hidden risks, extend battery life and improve sustainability.

The session explains why common maintenance approaches can leave gaps, how battery selection impacts long-term cost and environmental impact, and which actions protect both uptime resilience and capital investment.

In addition to actionable strategies to improve reliability, participants will take away a CIBSE-accredited certificate that counts towards their annual CPD requirement.

Enwa Water Technology UK

ADVANCED WATER TECHNOLOGY enwa

● **Phone: 01530 830354**
Email: uksales@enwa.com
Web: enwa.co.uk/cibse-approved-cpd-seminar

Enwa's CPD is ***The importance of effective filtration and water treatment for heating and cooling systems***.

The seminar focuses on filtration and water-quality requirements for modern HVAC systems, with reference to BSRIA and VDI guidelines, and includes:

- Key issues that threaten new-build and refurbishment projects, and a demonstration of how to identify and reduce these risks
- The positive impacts of effective water treatment and filtration on performance, resilience and lifespan, illustrated through case studies
- The role of automation, effective control and management, and how shortcomings in design and procurement can adversely affect project commissioning, completion, warranty, and legacy stages
- The impact on life-cycle costs, energy efficiency, and the environmental implications of failing strategies.

We provide a free, one-hour lunch and learn session at your office, or online sessions.

Euroklimat

EK EUROKLIMAT Let's go Natural

● **Phone: 07712 793122**
Email: edepantz@euroklimat.it
Web: euroklimat.it

Stay ahead of the curve with Euroklimat's CPD ***Propane R290 – HVAC standards and safety – HVAC Thermodynamics***.

As the first European manufacturer to adopt R290 in chillers (2006) and heat pumps (2018), Euroklimat is leading the transition to sustainable refrigerants. Its CPD offers an in-depth exploration of R290 (propane) as a natural refrigerant, aligning with the F-gas roadmap and the latest EU regulations and standards.

Learn how R290 is shaping the future of HVAC, with a focus on safety protocols, compliance measures, and the manufacturer's best practices to ensure safe and efficient system operation. Also discover the thermodynamic advantages of R290 in air-to-water chillers and heat pumps, and understand how it compares with HFC- and HFO-based alternatives.

Whether you're a consultant, engineer or HVAC professional, this CPD provides essential insight and practical guidance for the low-GWP transition. With a focus on performance, efficiency and environmental impact, it gives you the knowledge to make informed decisions about system design and refrigerant selection.

Evac Vacuum Drainage System

EVDS European Vacuum Drainage Systems

● **Phone: 01634 684779 / 07977 135728**
Email: stephen.royle@evds.org.uk

Are you shaping a world in which buildings stretch wider, repurpose faster and offer more flexibility than ever before?

Are deep floor plates, long horizontal pipe runs and distant wet rooms becoming the new standard in your projects – and are you growing frustrated that traditional gravity-based plumbing can't keep up with your ambition?

Or do you simply wish to save valuable water, or have a drainage system that is effective with infection control?

It's time to rethink what's possible. Join us for a dive into something radically different – an innovation that challenges long-held assumptions and unlocks new ways to design, convert and reuse space. We promise: no stacks, no slopes, no compromises – just the freedom to shape space exactly as you envision it.

Everything you thought you knew about drainage is about to change. Let us present to you the Evac Vacuum Drainage System. Our CIBSE-accredited CPD will cover a range of topics including:

- Who are Evac?
- What is a vacuum drainage system?
- Where can I use one?
- How it works
- Vacuum toilets = water savings
- Design
- Past projects

Firesafe

FIRESAFE FIRE RATED DUCTWORK®

● **Phone: 01706 687863**
Email: enquiries@firesafeductwork.co.uk
Web: firesafeductwork.co.uk

CIBSE Patron Firesafe Fire Rated Ductwork specialises in fire-resisting ductwork, and is the creator and IP holder of the Queen's Award-winning Caswell Firesafe brand.

Since 2024, CIBSE has designated building safety CPD activity as mandatory for all its members.

Firesafe's free, one-hour, CIBSE-approved, interactive CPD is delivered via Microsoft Teams by our expert team, including the chairs of the ASFP TG6 Committee and BSI FSH 22/9 ductwork committee.

It provides comprehensive technical content, practical guidance and follow-up support on fire-resisting ductwork, and topics include:

- What is fire-resisting ductwork? Explanation of construction types
- Applications, including fire resisting, smoke control and commercial kitchen extract
- Test standards criteria for A, B and C duct tests; stability, integrity and insulation
- Specification and certification to BS 476:Part 24, EN1366-1 and 8, and EN 12101-7
- Classification standards, EU/CPR regulations and Certificate of Conformity
- Function and installation of ductwork supports, fixings and penetration seals.

GF Building Flow Solutions

+GF+

● **Phone: 01923 381212**
Email: customersupport.uk@uponor.com
Web: georgfischer.com / uponor.com

GF Building Flow Solutions' mission is to solve the challenges of our time: the increasing demand for energy-efficient and affordable buildings, inviting and safe homes, and delivering clean and safe drinking water.

Harnessing the power of water, GF aims to improve buildings, drive progress, and help customers achieve greater productivity and sustainability, while ensuring comfort, health and efficiency.

By bringing together the industry-leading expertise of GF, Uponor and JRG, and uniting trusted Swiss, Finnish and German quality under one roof, it offers the most comprehensive range of applications for hot- and cold-water supply and control, noise-reducing wastewater systems, and energy-efficient heating and cooling, delivering outstanding performance and customer satisfaction.

We use this expertise to drive knowledge forward and support the use of cutting-edge solutions. Key to this is our CPD programme, which includes sessions on minimising heat and energy losses in heat networks.

GF is listed on the SIX Swiss Exchange, employs about 15,700 professionals worldwide and is present in 46 countries. In 2024, it generated sales of CHF4,776m (£4,480m).

Hamworthy

Hamworthy

● **Kevin Potter, national sales manager**
Phone: 07957 815391
Email: kevin.potter@hamworthy-heating.com

Hamworthy Heating is a UK manufacturer of commercial heating and hot-water solutions.

As part of its commitment to empowering its customers with the right advice, knowledge and specification for their heating and hot-water projects, Hamworthy offers a large number of CIBSE-approved CPD seminars, led by our expert team, including:

- ***Introduction to heat pumps: technology and principles***
- ***Best practice in domestic hot water (DHW): design and solutions (module 1)***
- ***Considerations for commercial air source heat pumps: selection, specification and system application***
- ***Best practice in DHW: safety, water treatment and legislation (module 2)***
- ***Best practice in DHW: sizing (module 3)***
- ***Boiler controls: unwiring the jargon***
- ***New boilers on old heating systems: hydraulic designs.***

Hamworthy can offer its CPD seminars online or in person – at its site or yours.

Helvar

Helvar

● **Email: Alan Jackson**
info@helvar.com
Web: helvar.com

Buildings designed for people, with intelligent lighting systems and interoperable services, create workplaces that are more comfortable, more productive, and healthier. They sense the environment and work with you to optimise the internal space, whatever the task or activity.

In Helvar's CPD lunch and learn session, participants will discover how intelligent lighting, smart sensing, interoperable building services, data and wellbeing are intrinsically linked.

The session will also reveal how intelligent and interoperable systems can reduce carbon emissions, optimise energy consumption, improve efficiency, and positively impact productivity, health and wellbeing.

Humidity Matters

HUMIDITY MATTERS

● **Web:humidity matters.co.uk**

Humidity Matters is one of the leading suppliers of humidification and adiabatic cooling systems in the UK. It engages with every level of the supply chain from detailed design concept to after sales, including full turn-key applications.

Education in humidity control is paramount to the company's success – hence its commitment to CPD training. ***Why humidification?*** is a one-hour CPD course that covers the basics of humidification and adiabatic cooling, including: the design process; application and selection of different systems; and load calculations and dispersion through absorption distance calculations. Why? Because Humidity Matters.

Humidity Solutions

HUMIDITY SOLUTIONS

● **Phone: 01372 571200**
Email: info@humiditysolutions.co.uk
Web: humiditysolutions.co.uk

With decades of industry experience, the experts at Humidity Solutions deliver bespoke humidity control solutions for a wide range of commercial and industrial applications.

It offers CPD presentations on humidification and dehumidification, covering both sides of humidity control in depth. Each presentation includes a brief look into psychrometrics, the importance of humidity control, and sizing, technology, and offers advice from our experts.

Humidity Solutions also delivers CPDs on direct and indirect adiabatic cooling, alongside seminars covering destratification fans, air curtains and energy-efficient heating solutions.

Its CPDs are available as hour-long working lunches with refreshments. Presentations can also be delivered online via a webinar.

Each session includes a question and answer section to ensure your team comes away with the information they need.

Ideal Heating Commercial Products

ideal HEATING COMMERCIAL

● **Richard Brown, head of specification sales**
Phone: 07718 192161
Email: specification@idealheating.com
Web: Idealcommercialheating.com

Ideal Heating Commercial Products is the UK's leading commercial heating manufacturer of high-efficiency commercial heating solutions. Its CPDs can be delivered online or in person at your premises or one of its centres of excellence.

- NEW for 2025: ***Surveying the modern plantroom: from boilers to heat pumps*** – how to survey and modernise a plantroom, with a particular focus on boiler retrofit installations and improving efficiency using heat pump technology or hybrid systems.
- ***Understanding refrigerants and how they affect the choice of commercial heat pumps*** – this looks at both synthetic and natural refrigerants, and how they influence the choice of heat pumps for different applications.
- ***Heat networks and heat interface units*** – understanding heat networks and the role of HIUs in ensuring thermal comfort and the efficient operation of the network.
- ***Low carbon systems: appliances and applications using heat pump technology*** – the principles underpinning the mechanics and operation of heat pump systems, the types of heat pumps available, and the importance of correctly sizing heat pumps.
- ***A review of commercial boiler heat exchanger materials*** – covers the different materials for heat exchangers and how to look after them.

IMI

IMI Climate Control

● **Email: marketing.uk@imiplc.com**
Web: climatecontrol.imiplc.com/en-gb/cpd-courses

IMI is committed to making complex HVAC concepts simple and intuitive, providing practical solutions that help you stay ahead in the industry. Its CPD courses offer targeted insights into balancing and control, pressurisation, and water quality.

- ***Principles of pressure maintenance*** – this course explains the critical role of pressurisation in HVAC systems, introducing the concept of dynamic pressurisation and its impact on system performance. You'll also learn about optimal pressurisation placement and best practices for commissioning.
- ***Expansion vessel sizing*** – this breaks down UK standards and European norms for sizing expansion vessels, guiding you through the equations and methods recommended by CIBSE. You will leave with a clear understanding of how to apply these principles in real-world scenarios.
- ***Minimum controllable power in variable flow systems*** – this explores how seasonal load variations impact flowrates and system stability. It covers the performance differences between DPCVs, PICVs, SMART valves, and standard control valves, giving you the insights to maintain room-temperature stability.

IMI's CPD courses provide practical, actionable knowledge in a straightforward, easy-to-understand format.

IWTM

IWTM water by design

● **Phone: 020 8255 2903**
Email: info@iwtm-uk.com
Web: iwtm-uk.com

IWTM is the world leader in chemical-free water treatment for closed loop networks and has been in operation in the UK for more than six years. It offers CPDs on the design, maintenance and operation of chemical-free water treatment for closed loop networks.

Water is the lifeblood of a hydronic system, so the quality of that water is critical to the operating efficiency and life of the components and network.

Chemical-free water treatment offers a host of advantages over traditional regimes and there has been huge growth in its use in both retrofit and new projects.

IWTM's CPD introduces chemical-free water treatment, its component parts, design, operation, maintenance, and the water standards it achieves, including VDI2035. Areas covered include:

- What is corrosion and what causes it?
- What is the technology behind chemical-free water treatment?
- Current UK Guidelines BSRIA BG29/50 and CSA TM20; introducing VDI2035
- Product selection
- Installation and maintenance
- Benefits/advantages
- Case studies.

Lochinvar

● **Phone: 01295 269981**
Email: info@lochinvar.ltd.uk
Web: lochinvar.ltd.uk

Lochinvar manufactures and supplies heat pumps, solar thermal systems, gas-fired water heaters, boilers, and related ancillaries. With extensive sector expertise, it delivers CIBSE-accredited CPD seminars, including:

- NEW for 2025: ***Heat pumps for commercial domestic hot water*** – air source heat pump (ASHP) sizing and selection for DHW production; traditional DHW ASHP design; integrated vessel DHW ASHP selection and design; high-temperature R290 and CO_2 systems design; 4-pipe heat recovery for DHW design; stratification and controlled stratification in DHW storage; and single versus multi-pass DHW technology.
- ***Heat humps for commercial heating cooling and heat recovery applications*** – R290 refrigerant design consideration; legislation and regulations; design and clearance requirements; heat pump applications and system design; LTHW – ASHP; DHW – ASHP and waste water heat pump; CHW and heat recovery – 4-pipe ASHP design.
- ***Sizing and selection of direct gas-fired water heaters*** – hot-water demand patterns; manufacturer's sizing software; CIBSE and IOP guidelines; water heater types; renewable integration; selection criteria; SBEM implications.

Go to the Lochinvar website to register.

Medem UK

● **Stuart Mason**
Phone: 0161 233 0600
Email: sales@medem.co.uk

Medem's ***Safe use of gas in education buildings*** CPD provides essential guidance for the design, installation and ongoing management of gas systems across key educational spaces, including laboratories, food technology rooms, boiler rooms and production kitchens.

It explores statutory obligations and industry best practice, equipping delegates with the knowledge to ensure safety, compliance and efficiency within education environments.

The CPD examines core standards and guidance documents, such as IGEM/UP/11, IGEM/UP/19, BS 6173, BB80, BB100 and BB101, breaking down their application in real-world scenarios.

Delegates will gain a clear understanding of responsibilities, from duty holders and staff to contractors, and how to apply effective risk assessments to mitigate hazards.

Key focus areas include the role of gas pressure proving systems, ventilation interlocking, and the integration of CO_2 and gas-detection technologies as part of a layered approach to safety. There is also guidance on the importance of planned maintenance regimes, plus current design best practice.

By the end of the CPD, participants will have practical insights to implement robust safety measures, safeguard building users and meet regulatory requirements.

Munters

● **Phone: 01480 432243**
Email: info@munters.co.uk
Web: munters.com/en-gb

Munters' CIBSE-approved CPD seminars give a comprehensive introduction to dehumidification and humidification theory.

With its recently launched humidification CPD, you will learn about the impact of moisture, combating seasonal fluctuations, and how to achieve the most cost-effective and energy-efficient climate solution for you or your customer.

Munters' CPDS can cover:

- ***Dehumidification or humidification theory***
- ***Basics of humidity and use of psychrometric chart***
- ***Methods of dehumidification or humidification and its benefits***
- ***Dehumidification or humidification in industry: case study examples***
- ***Energy-saving technology and applications***
- ***Implications of high and low relative humidity on materials, manufacturing, and human heath.***

Suitable for consultants and industry professionals, these seminars are held in person, at your office, or online. Munters can provide a free lunch (subject to conditions – ask for details.)

To book a CPD, visit **go.munters.com/CPD**

Philip Payne

● **Web: www.philippayne.co.uk/contact**

Philip Payne offers a professional CPD presentation entitled ***LG12 Emergency Lighting Seminar***. Designed for architects, consultants, contractors and facilities managers, the session is non-sales based and focused on sharing knowledge and best practice.

Emergency lighting and signage present a number of challenges for designers, installers and end users alike. This presentation explores how requirements differ across building types, the implications of legislation and standards, and the practical steps needed to ensure compliance with CIBSE LG12.

Delegates will gain a clear understanding of why emergency lighting is required, how to design systems that meet current UK standards, and which design principles represent best practice. The seminar also addresses responsibilities for testing and maintenance, giving end users a practical framework for carrying out ongoing checks with confidence.

By covering legislation, lighting design, testing requirements and emerging technologies, this CPD provides a comprehensive grounding in emergency lighting strategy – balancing compliance, performance and user needs.

Philip Payne's LG12 CPD is fully accredited by RIBA and CIBSE, providing a recognised route for professionals to strengthen their knowledge while earning CPD hours.

Polypipe

Polypipe Building Services

● **Phone: 01622 795200**
Email: commercial enquiries@polypipe.com
Web: polypipe.com/commercial-building-services

Polypipe Building Services develops and delivers engineered solutions in drainage and water supply. Its specialist technical team helps customers to complete safe and sustainable installations within high-rise residential, office, education, healthcare and leisure properties.

For more than 60 years, Polypipe's Terrain brand has been the benchmark for drainage systems. Now, its award-winning MecFlow Supply Systems range is delivering new advances in water supply, offering a complete plantroom-to-apartment solution.

MecFlow Fusion is a WRAS-approved PP-RCT system, with a B-s1, d0 fire rating, for boosted cold-water, low-temperature hot water, chilled water and heating applications.

MecFlow Press is engineered for potable, hot and cold plumbing and heating installations, based on a multilayer composite pipe material with innovative, flow-optimised fittings.

Polypipe's Advantage Service creates complete drainage and water supply systems – fully customised and prefabricated off site – that are quality assured, pre-tested and delivered direct to site ready for installation.

Whether you need a single component or a complete customised system, Polypipe has the design, fabrication and testing capabilities, plus specialist advice and customer support, to ensure your project is a success.

Powrmatic

POWRMATIC

● **Phone: 01460 53535**
Email: marketing@powrmatic.co.uk
Web: powrmatic.co.uk/cpd

Powrmatic is a leading manufacturer and HVAC design partner, supplying warm air, radiant, electric and water-based systems, natural and smoke ventilation, and air conditioning. It collaborates with architects, consultants and building specialists to deliver sustainable systems that support decarbonisation.

As a CIBSE-accredited CPD provider, it delivers training that promotes sustainable and optimised HVAC design in commercial and industrial buildings, including:

- ***Decarbonising large-scale buildings with HVAC*** – this explores emissions-reduction HVAC strategies and solutions, retrofit and new-build challenges, the transition to electric and hybrid systems, and compliance with EPC, MEES and ESG standards.
- ***Smoke and natural ventilation systems – concept, compliance, and practical application*** – highlights ventilation's role in safety and performance, with guidance on SHEVS, product selection and application, natural ventilation strategies, design choices, and Part L.
- ***Optimising climate control in warehousing and logistics with air rotation*** – the principles, design and installation of air-rotation systems, and how they prevent stratification, protect stock, reduce energy use, ensure compliance, and future-proof operations.

Recotherm

Recotherm
BREATHE THE DIFFERENCE

● **Phone: 01527 894533**
Email: enquiries@recotherm.co.uk
LinkedIn: linkedin.com/company/recotherm-limited

Recotherm's CIBSE CPD ***Designing swimming pool ventilation systems*** is hosted by engineer and innovator Martin Killen, who founded the company in 1985.

Recotherm has pioneered a system of controlled fresh air combined with heat recuperator technology, and Killen introduced new energy efficiencies into the design of indoor pool air handling units (AHUs).

In the CPD, he shares his expertise and insights into the unique challenges and best practices in swimming pool ventilation, including:

- The dos and don'ts of ventilation design
- Energy efficiency and recovery in humid environments
- Innovative solutions and tailored AHU configurations.

There's also a Q&A, giving you the chance to ask about the presentation, as well as your current projects.

By the end of each session, attendees will have gained:

- A deeper understanding of key ventilation principles specific to swimming pools
- Heightened awareness of the importance of efficiency on pool operator running costs
- CPD points.

Killen and the team can host a lunch and learn session at your offices, deliver a hybrid presentation, or run the CPD entirely online.

Saniflo

SFA Saniflo

● **Phone: 020 8842 0033**
Email: marketing@saniflo.co.uk

Saniflo UK – part of the SFA Group and a leading designer and manufacturer of pumps, macerators and lifting stations – offers a CIBSE-approved CPD module for public health engineers, mechanical consultants, architects, mechanical installers and specialist resellers.

The hour-long talk – which can be supplemented with a two-hour session of pump-curve training if required – will discuss and offer technical training on macerators and lifting stations for commercial and domestic buildings. It is part of wastewater and drainage in the public health sector/mechanical engineering.

By the end of the presentation, attendees will:

- Understand the challenges of gravity-fed drainage systems
- Be able to identify where and when to use a macerator or lifting station
- Be able to navigate critical installation requirements and considerations
- Understand some of the key differences between the lifting station technologies
- Be able to use pump curves to help specify the correct pump.

Socomec

Regardless of industry or sector, everyone is now required to undertake CPD. The updating of skills and knowledge is critical for keeping abreast of industry changes, maintaining professional competence and ensuring that qualifications do not become obsolete.

Socomec offers seven comprehensive professional development seminars, delivered by highly experienced critical system application engineers. Hosted at your offices and available for between four and 40 people, the seminars take approximately one hour. Individuals will receive a presentation pack and a certificate on completion of the CPD

Courses:

- ***General introduction to UPS systems.***
- ***The benefits of Modular UPS Systems.***
- ***Earthing and neutrals within transformer and transformer-less UPS.***
- ***The application of three and four Pole STS units.***
- ***Automatic transfer switch essentials.***
- ***Power monitoring: causes, effects and solutions.***
- ***Energy storage.***

Phone: 0333 015 3002
Email: info.uk@socomec.com
Web: socomec.co.uk

S&P Ventilation Systems

Developed by Ian Davis, an industry expert in ventilation, S & P's CPDs reflect a deep technical knowledge and commitment to best practice. Each session is designed to equip professionals with practical, standards-based insights across air quality, sustainability and system design – supporting safer, more efficient and future-ready buildings. The available CPDs are:

- NEW for 2025: ***Fan selection and air movement*** – delve into air movement fundamentals and fan selection. Learn about impeller types, fan laws, system resistance, and performance curves. Perfect for designing efficient, compliant ventilation systems across sectors.
- ***Indoor air quality (IAQ)*** – explore the causes and effects of poor IAQ, and gain an understanding of filtration standards and practical knowledge to enhance health, compliance and system performance.
- ***Embodied carbon (TM65)*** – understand embodied carbon in MEP design using CIBSE TM65. Learn data requirements, calculation methods and sustainable product selection. Ideal for professionals aiming to reduce carbon impact in buildings.
- ***Kitchen ventilation (DW/172)*** – covers airflow calculation, canopy design, filtration and compliance. Essential for safe, efficient and hygienic commercial kitchen environments.

Phone: 01473 276890
Email: cpdbookings.uk@solerpalau.com

SPC

SPC is a specialist in heating and cooling solutions. Its extensive range of products – including heating and cooling coils, radiant heating and cooling panels, fan convectors, trench heating and cooling, air curtains and unit heaters – are manufactured in-house, ensuring consistent quality and reliability.

A trusted CPD provider since 1997, SPC delivers CIBSE-approved training that supports engineers, consultants and contractors across the building services industry.

The company continually invests in its presenters, to ensure each CPD session combines technical expertise with practical, real-world application.

Its CPDs include:

- NEW for 2025: ***An introduction to coil heat exchangers*** – coil design, heat transfer, performance considerations and electric heater batteries.
- ***Decarbonisation of industrial and commercial heating systems*** – renewable energy, heat pumps, low-temperature design, embodied carbon, and funding.
- ***Radiant heating and cooling panels*** – heat transfer, panel design, system benefits, applications, and controls.
- ***Design considerations for trench heating*** – system types, applications, sizing, energy-efficient controls and grille options.

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Swegon

Swegon is committed to helping building services professionals expand their knowledge and stay ahead in a fast-changing industry. Its CIBSE-accredited CPD programme has been developed to share expertise across all aspects of indoor climate and HVAC, supporting better design, operation and maintenance of buildings.

The sessions cover a broad range of topics, from the fundamentals of ventilation, acoustics and air distribution, through to areas such as heat pump integration, air handling efficiency, and indoor environmental quality.

Each CPD is delivered by experienced specialists who combine technical know-how with practical examples, ensuring attendees take away ideas that they can apply directly to projects.

Flexibility is at the heart of Swegon's approach. Sessions can be delivered online or in person, tailored for individuals or larger design teams. By engaging with current standards, legislation and best practice, the programme helps consultants, contractors and engineers to develop the confidence to deliver high-performing and sustainable buildings.

Through its CPDs, Swegon aims to support the industry in achieving healthier indoor environments, lower energy use and long-term life-cycle value – knowledge that benefits people and the planet.

Phone: 01634 981400
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Web: swegon.com/uk

Systemair

● **Phone: 07475 886642**
Email: cpd@systemair.co.uk
Web: systemair.com

Systemair has led the world in energy efficient ventilation products for more than 50 years. It offers a range of accredited CPD technical training courses, in person at your offices, in its expo centre in Birmingham or online – at times and days to suit you. It can also tailor specific sessions with in-person training.

- ***Energy-efficient ventilation*** – ventilation running costs and carbon footprint savings using demand-control EC motor technology and energy-recovery components.
- ***Low energy air conditioning with indirect adiabatic cooling*** – alternative methods of air conditioning that can reduce or eliminate the use of refrigeration-based cooling.
- ***Residential ventilation and MVHR*** – an introduction to different types of residential ventilation systems, and how they are designed and integrated into a building.
- ***Swimming pool ventilation and heat recovery*** – technical seminar suitable for mechanical and electrical services engineers designing swimming pool hall ventilation systems or carrying out energy surveys on pools.
- ***Passivhaus ventilation systems*** – design and comparison of ventilation systems for Passivhaus buildings.
- ***Smoke control systems*** – the principles of design and control of smoke systems.

Tridonic

● **Tel: 01256 374306**
Email: michelle.parkin@tridonic.com

Tridonic's programme of CIBSE-accredited CPD training modules offers industry professionals an opportunity to deepen their knowledge of cutting-edge lighting technologies and sustainable building practices.

Its CPD modules are tailored to meet the evolving needs of engineers, designers and specifiers working in the built environment.

Accredited by CIBSE, the sessions ensure participants gain recognised learning outcomes that contribute to their professional credentials. They are delivered by Tridonic's expert team, either in-person or online, offering flexibility to suit busy schedules.

Whether you're looking to stay ahead of regulatory changes, enhance your technical expertise or drive innovation in your projects, Tridonic's CPDs are a trusted resource for professional growth.

Available CPDs:

- ***LED lighting topics*** – driver and module technology, lifetime and lumen depreciation, terminology, flicker and handling.
- ***Smart building*** – digital lighting protocols, DALI-2, DALI D4i, DALI+ and Bluetooth.
- ***Emergency lighting*** – overview of emergency lighting, battery technology and DALI-2 emergency.
- ***Specialist modules*** – human-centric lighting and outdoor lighting.

Vexo International

● **Phone: 01767 500150**
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Web: vexoint.com/cpd

Vexo International offers a superior range of water-quality products for HVAC efficiency through side-stream filtration, smart BMS controls and additives.

It offers a CPD on closed system water treatment, which can be delivered in your office, via MS Teams, or at its premises in Biggleswade.

The CPD covers the importance of maintaining water quality in closed systems, the impact on energy efficiency, and system longevity. Participants can learn about best practices for water treatment, the role of inhibitors and the benefits of side-stream filtration.

The seminar is designed for mechanical engineers, facilities managers and anyone involved in building services maintenance.

To arrange a seminar, contact Vexo International. Lunch and Learns are also available for parties of six or more.

2G Energy

● **Phone: 01928 718533**
Email: sales@2-g.com
Web: 2-g.com

2G Energy is the UK subsidiary of 2G Energy AG, a leading manufacturer of combined heat and power (CHP) systems. Based in Runcorn, Cheshire, we have been delivering high-performance CHP solutions across the UK since 2011, with hundreds of installations in biogas, natural gas and hydrogen applications.

As the world moves toward a cleaner energy future, 2G is at the forefront of innovation, being the first company, globally, to offer CHP systems that operate on 100% hydrogen, producing zero carbon emissions. Our product range includes highly efficient CHP plants from 20kW to 2,500kW, designed to maximise energy efficiency for farms, municipalities, housing, commercial enterprises and industrial sectors.

With more than 10,000 installations worldwide, 2G Energy combines German engineering excellence with UK-based expertise, to provide reliable, decentralised power and heat solutions. Our fully trained service engineers ensure maximum uptime, supported by an extensive UK-based parts inventory and direct access to our German headquarters for rapid component supply.

FLOWGRID AIR VOLUME SENSOR

- Accurate average air volume measurement
- Multiple differential pressure sensing points
- Averaging velocity pressure tank
- Suitable for bi-directional volume measurement
- Low velocity detection from 0.5 m/s
- Frame made in galvanised metal or stainless
- Standard mounting flanges 20-30-40 mm
- Height manufactured in 100mm increments
- Width manufactured in 50mm increments
- Length 300 mm to fit the CMR Dampers
- Sizes 3000 x 3000mm have been manufactured
- Custom made sizes can be manufactured
- 35 Years field application experience

CMR FLOWGRID

The FGG Flowgrid has been designed to measure air volume in ventilation ducts. The Flowgrid consists of a standard duct section with a length of 200 and 300 mm and is available with a 20-30 or 40mm duct connection flange to suit standard duct work

The CMR sensing probes are fitted across the internal duct frame area in predefined spacing. Each probe has a number of pressure inlet points to measure the impact and static pressure at the same time and provide an average velocity measurement.

The result is a velocity pressure which ultimately provides a total air volume measurement. Both static and impact pressure have an independent pressure averaging tank which provides a smooth pressure signal of the whole measured area.

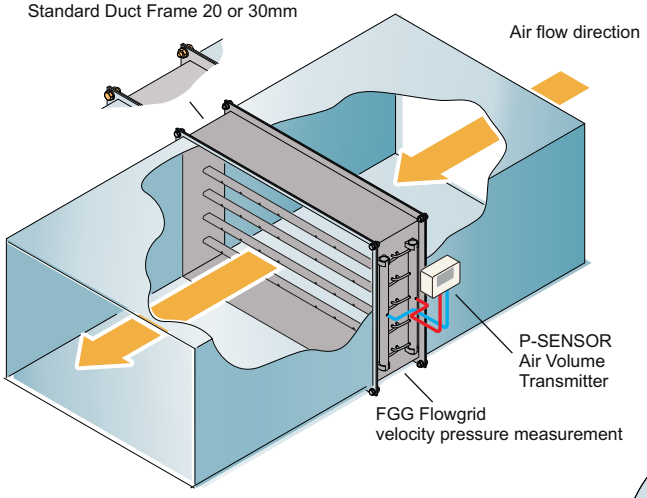
Another great advantage of the FGG Flowgrid is, that it can measure bi-directional as it is manufactured equally on both sides. This means, the air flow is measured in one direction and should there be a reverse flow, this can be detected and measured when using the CMR P-SENSOR.

The Flowgrids are manufactured in standard height increments of 100mm going up to a maximum height of 1200mm. Custom sizes can be made 3000 x 3000mm

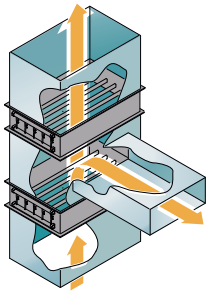
The Flowgrids are installed in many projects such as

Commercial Buildings - Industrial Production Plants - Pharmaceutical Production - Validated Monitoring Systems Hospital Isolation Rooms - Operating Theatres - Data Centres

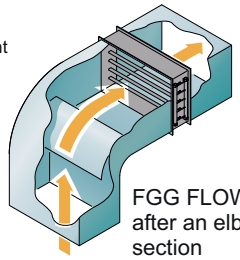
FGG FLOWGRID and P-SENSOR providing accurate average air volume measurement in ducts.



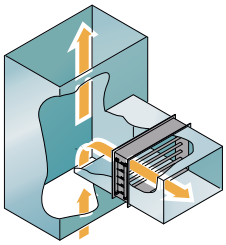
P-SENSOR
With LCD display
and keyboard



FGG FLOWGRID
before and after a
T- duct section



FGG FLOWGRID
after an elbow duct
section



FGG FLOWGRID
in a T- duct section

CMR is ISO 9001 and UKAS accredited

CMR CONTROLS Ltd
Precision Air Pressure and Volume Sensors

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CMR

CPD programme

Air distribution systems

Airflow measurement and sensor technology in healthcare cleanrooms

This module explores the importance of accurate airflow measurement, data measurement and sensor technology in critical healthcare ventilation applications

'The very first requirement in a hospital is that it should do the sick no harm.' – Florence Nightingale.

The UK government's Spending Review in June 2025 announced £750m of funding for infrastructure repairs at more than 400 NHS hospitals, mental health units and ambulance sites. The opportunity exists to improve, where it is needed, ventilation systems across the healthcare estate.

Preventing airborne contamination, ensuring patient and staff safety, maintaining medical product integrity and achieving energy efficiency targets are essential outcomes from critical healthcare ventilation systems (CHV).

CHV systems are crucial for ensuring the safety of their respective areas. Health technical memoranda (HTMs) – and, specifically, HTM 03-01 *Specialised ventilation for healthcare premises*[1] – provide the authoritative guidance, and compliance is paramount.

The areas defined by HTM 03-01 as needing specialised critical ventilation because of high risk include: ultra-clean ventilation systems, such as operating theatres; and isolation rooms, such as wards for patients with airborne infectious diseases.

HTMs distinguish mandatory, legally binding requirements ('must') from key best-practice recommendations ('should') that support their stringent standards. This guidance is critical for design, installation, operation and maintenance, and is applicable across the entire building life-cycle.

The HTM establishes a standard approach for identifying and labelling ventilation systems, as well as developing an inventory of installed systems.

The inventory will be arranged according to the following categories:

- Local exhaust ventilation systems (LEV)
- Critical healthcare ventilation systems (CHV)
- General ventilation systems (GVS)
- General extract systems (GES)
- Smoke clearance and heat exhaust systems (SHEVS).

The 2021 version of HTM 03-01 introduced the concept of the ventilation safety group (VSG) in healthcare organisations, which oversees the management of the healthcare provider's ventilation systems and reports at board level. The HTM suggests a typical composition for a VSG, to ensure the necessary expertise is brought together to manage ventilation risks (see panel, 'Disciplines in the ventilation safety group').

The primary driver in CHV systems is mitigation of airborne infection risks, particularly in sensitive areas such as operating departments, critical care facilities and isolation rooms. (See panel, 'Airflow strategies for infection control'.)

Poorly designed or maintained systems can become sources of microorganisms. Ventilation directly protects vulnerable patients from airborne organisms and fungal spores in rooms such as intensive care units and transplant units. It safeguards staff from anaesthetic agents, microorganisms and toxic substances.

Controlled environments are vital in pharmacy aseptic preparation facilities and sterile services departments, to ensure quality assurance and compliance with EU good manufacturing practice (GMP), which describes the minimum standard that a medicines manufacturer must meet in its production processes if its medicines are to be sold in the EU.

Airflow measurement is mandated by legislation

Figure 1: A P-sensor ultra-low air pressure and air volume sensor (Source: CMR)

CPD CIBSE APPROVED

Continuing professional development (CPD) is the regular maintenance, improvement and broadening of your knowledge and skills to maintain professional competence. It is a requirement of CIBSE and other professional bodies. This *Journal* CPD programme can be used to meet your CPD requirements. Study the module and answer the questions on the final page. Each successfully completed module is equivalent to 1.5 hours of CPD. Modules are also available at cibsejournal.com/cpd

such as the Health and Safety at Work etc. Act 1974 and Control of Substances Hazardous to Health (COSHH) Regulations 2002, which require statutory examination and testing of local exhaust ventilation at least every 14 months. Failure to maintain standards can lead to increased health risks and legal action.

HTM 03-01 states that all CHV systems will be inspected quarterly and verified at least annually. The purpose of verification is to determine if the system is performing to an acceptable level. Airflow and its measurement are clearly key to this annual verification, as well as the initial commissioning and the final acceptance validation.

Figure 2: Flowgrid air volume measurement system (Source: CMR)

Critical sensors for ventilation systems

Sensors are the 'eyes and ears' of a ventilation system, providing data for continuous monitoring, automatic control, alarm generation and data logging within the environmental monitoring system (EMS), which works independently using independent sensors in parallel with the building management system (BMS).

The accurate measurement of the quantity and condition of the air is crucial to maintaining the performance of the system and, hence, its role in infection control. The EMS sensors are calibrated to the appropriate standard and must have valid calibration certificates.

The air change rate is a crucial metric in healthcare ventilation. Accurate measurement and verification are essential to ensure compliance with required standards for each space. This will also be key to maintaining pressure differentials required between spaces. Sensors are essential for collecting this data and must be calibrated to the appropriate standards.

Differential pressure sensors

These are fundamental for recording or indicating air pressure differentials between adjacent rooms – crucial for contamination control. They verify positive pressure in sterile areas (for example, operating theatres) and negative pressure in isolation rooms.

The sensor has two ports connected by small tubes to the spaces being compared. It continuously monitors the pressure difference and sends a signal to the EMS. If the pressure deviates from the required setpoint (often around +10 to +15Pa), alarms can alert the operators. The maintenance team shall be alerted to rectify the automatic control system.

For example, HTM03-01 states that they should be used to indicate to the operating theatre control panel if the ultra-clean ventilation (UCV) canopy falls below 80% of its design flowrate.

Direct-reading Magnehelic mechanical gauges, with green and red indicators for differential pressure ranges, are required at critical points.

Electronic pressure transducers (such as those manufactured by CMR Controls) are sensors that convert the force exerted by the air into a measurable electrical signal (voltage/current or digital). They feed continuous data to the EMS for automated monitoring, plant failure, low airflow and 'filter fault alarms'. Plant failure and low airflow alarms should be indicated when the air quantity falls below 80% of the design value.

Airflow/volume/velocity sensors

These are electronic devices that measure and quantify the movement of air, providing the critical data needed to monitor, manage, control and optimise ventilation and process systems.

These are essential for measuring air volume and velocity in systems, and to ensure adequate dilution and 'scouring' in spaces.

In UCV theatres, they confirm the high air velocity needed to purge surgical zones. It is normally expressed as air-change rate. Methods of measuring velocity include veloprobes, flowgrids, pitot tubes and manometers for ducts, thermal anemometers for precise velocity, and calibrated hoods (balometers) for terminal air volumes.

HTM03-01 states that ventilation system performance should be measured at the main and branch duct test points with either a pitot tube or a thermal manometer. Accurate and meaningful duct measurements depend on using the correct method, including proper spacing of – and the appropriate number of – measurements across the ductwork cross-section.

It is essential to fully recognise this, as inaccurate data collection may result in – and subsequently hinder the identification of – performance issues. CPD modules 61 and 235 give more background on in-duct measurements in ventilation systems.

Disciplines in the ventilation safety group (VSG)

The VSG should be a multidisciplinary group and, typically, comprise the following, according to HTM 03-01:

- **Authorising engineer/independent adviser for ventilation**
- **Infection prevention and control nurse or specialist**
- **Authorised person(s) for ventilation services**
- **Estates (operations and projects) staff**
- **Clinicians and specialist departments (for example, theatres, critical care areas, pharmacy, medical microbiology, nursing, decontamination)**
- **Personnel from the finance department with accountability for capital and revenue evaluation**
- **Other stakeholders as appropriate**
- **Co-opted expertise (for example, ventilation designers, consultants and suppliers).**

Plug and electronically commutated (EC) fans often have a measuring ring for direct output readings

Temperature sensors

These monitor room and supply air temperatures to maintain comfort and prevent detrimental conditions for patients or equipment. Actively ventilated sensors are preferred in critical areas such as operating theatres. In these situations, the sensors would be located in a sampling duct mounted on or adjacent to the theatre control panel, or in one of the theatre's low-level extract ducts.

Humidity sensors

These monitor relative humidity to prevent condensation and mould growth, and maintain specific environmental conditions. While acknowledged as prone to inaccuracy, they are important for applications such as pharmacy cleanrooms.

Clearly, the accuracy of the instrumentation and its correct placement in the ventilation system is key to delivering the required performance standards.

Commissioning, validation and control

The VSG's remit includes the commissioning and validation processes for ventilation systems. Proper commissioning and validation are essential for ensuring that systems function effectively to support patient and staff safety.

Sensor data is vital for commissioning, which brings systems to an operating condition, ensuring they meet design specifications and fall within their range of acceptable tolerances. The measurement equipment should have valid calibration certificates that are traceable to the appropriate standard

HTM 03-01 reinforces the point that in-duct measurement positions should be identified at the design stage. This should result in the correct placing of testing and measurement devices, resulting in accurate measurement. These positions will need to be accessible for commissioning and annual verification of the system performance. Addressing these issues during design ensures precise placement of measurement facilities.

Independent validation is undertaken on the completion of the commissioning processes. Independent validation assesses the 'fitness for purpose as a whole' of the entire installation, including building fabric and system performance.

It is important to note that the validation process is not a 'snagging'-type exercise. The system offered for validation is done so on the basis that it is fully complete, commissioned and achieving the required performance. The validator needs to be a suitably qualified competent engineer and independent of the system designers, contractors, suppliers, installers and commissioners. Calibration certificates must be issued to verify the accuracy.

The records on system performance generated during the validation process, and the ongoing information from the annual validation, are a legal requirement. The information needs to be in a form that can be readily accessed. HTM 03-01 Part A section 13 gives details of the required information to be stored and recorded.

Independent of the EMS sensors, ventilation system sensors enable real-time control adjustments via BMS, and can trigger alarms for plant failure or low airflow. This can ensure ongoing safe and efficient operation in live time, further supporting the delivery of patient and staff safety beyond the essential annual verification process.

Updating and managing healthcare ventilation infrastructure

Simon Everett's[2] research paper examines the difficulties involved in managing legacy ventilation systems within current healthcare estates. His paper gives a good overview of the situations faced by estates teams, including financial limitations, how to prioritise upgrades, the importance of the annual verification reports, and the overseeing of the ventilation systems by the VSG.

The paper makes the point that, if the annual verification indicates the system is not performing to the required standard – and, hence, 'should not be returned to service', as the HTM states – then this should generally not be a surprise to the senior leaders in the healthcare organisation (although he states it often is), as the VSG should be aware of ongoing life-cycle issues and have mitigation measures in place.

The reliable acquisition of accurate airflow measurement data verified by traceable calibration certificates is fundamental to the function and management of CHV systems

Accurate data will support ongoing work and management to ensure patient and staff safety, maintaining medical product integrity and achieving energy efficiency targets, the essential outcomes from CHV. Ultimately, precise airflow data underpins patient safety, operational efficiency and compliance. ●

● **Gordon Hudson is an independent consultant and CIBSE trainer. He also presents the *Vintage Sustainability* podcast – bit.ly/CJVSGH**

Airflow strategies in healthcare premises

Positive-pressure rooms

Operating rooms, ICUs and pharmaceutical compounding areas, where sterile conditions are paramount, all require clean filtered air. Contamination of these spaces from ingress of contaminated air is prevented by maintaining the space at a positive pressure relative to adjacent spaces. This results in clean filtered air moving outwards from the room, preventing contaminants from entering

Negative-pressure rooms

In some situations, it is necessary to protect staff and other occupants against airborne organisms from patients with an infectious disease (for example, tuberculosis, Covid-19, measles, chickenpox). The ventilation system is used to keep the room at a lower internal pressure to the surrounding spaces and draws air inwards, containing the pathogens within the room and protecting surrounding areas and staff.

Dilution and scouring

Beyond pressure, precise airflow rates are essential for diluting airborne contaminants and efficiently 'scouring' spaces. In ultra-clean ventilation (UCV) operating theatres, high air velocity purges contaminants from the surgical zone, significantly reducing post-operative sepsis. This ensures staff operate in a 'clean airflow path' and medicinal product integrity is protected.

Energy efficiency

Modern designs use accurate measurement to optimise energy consumption, supporting net zero carbon targets through control strategies such as 'setting back' systems (reducing output when not in full use).

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Module 256

November 2025

1. According to HTM 03–01, what is the primary driver in critical healthcare ventilation (CHV) systems?

- ☐ A Reducing electricity costs
- ☐ B Mitigation of airborne infection risks
- ☐ C Thermal comfort
- ☐ D To provide 24-hour access
- ☐ E Control of humidity

2. What is the role of the ventilation safety group (VSG), introduced in HTM 03–01?

- ☐ A To perform routine cleaning of ventilation ducts
- ☐ B To oversee ventilation systems and report at board level
- ☐ C To carry out patient satisfaction surveys
- ☐ D To design new medical equipment
- ☐ E To conduct pharmaceutical research

3. Why are differential pressure sensors critical in healthcare ventilation systems?

- ☐ A They measure energy consumption directly
- ☐ B They indicate contamination control between adjacent rooms
- ☐ C They monitor humidity in cleanrooms
- ☐ D They function as fan failure alarms
- ☐ E They are used only for fire safety alarms

4. In ultra-clean ventilation (UCV) operating theatres, HTM 03–01 requires alarms to trigger if the canopy airflow falls below 80% of its design flowrate. Why is this threshold critical?

- ☐ A Because airflow below 80% decreases energy efficiency but still maintains infection control
- ☐ B Because it signals inadequate airflow, compromising patient safety in the surgical zone
- ☐ C Because it ensures pressure differences are maintained in isolation rooms only
- ☐ D Because it reduces noise levels in the operating theatre environment
- ☐ E Because it is primarily a financial benchmark for measuring system efficiency

5. What type of pressure must be maintained in operating rooms and ICUs to protect patients from external contamination?

- ☐ A Neutral pressure
- ☐ B Negative pressure
- ☐ C Fluctuating pressure
- ☐ D Positive pressure
- ☐ E Zero differential pressure

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References:

[1] Health Technical Memorandum 03-01: *Specialised ventilation for healthcare premises* – **bit.ly/4mSQPyE**

[2] Everett, S D, (2024), 'Managing critical systems is often a challenging risk', *Health Estate Journal*, vol 78, issue 8, pp. 67–70 – **bit.ly/4ofZjBn**

Unlocking performance

Fourteen leading manufacturers reveal how their products and systems are maximising efficiency while reducing environmental impacts, to help create affordable, sustainable buildings

Aaron Brian, sales director, Andel
andel.com

Technology in this sector is no longer just about preventing immediate damage; it is about sustainability, resource efficiency and risk reduction

Q: How is technology evolving in the field of leak detection and environmental monitoring?

A: Leak detection and environmental monitoring has advanced rapidly in recent years, moving well beyond basic alarms to highly intelligent, integrated systems.

Andel combines innovation in sensor technology with data-driven platforms to deliver earlier, more accurate detection.

In the past, systems were limited to basic onsite alarms, but today's solutions offer wider coverage, the ability to pinpoint leaks more precisely, and practical features such as remote dashboards, email or SMS notifications, and easy integration with building management systems (BMSs).

Modern systems use hybrid sensor networks capable of detecting water, oil and gas simultaneously, alongside environmental factors such as humidity and temperature. These multi-zone panels allow clients to scale protection across entire sites, tailoring sensitivity levels to different risk areas.

Advances in cable technology also enable precise distance measuring, so operators know exactly where a leak has occurred. Just as importantly, these systems integrate with BMSs,

providing a single, intelligent platform for facilities managers.

Another major step forward is the use of cloud-based dashboards and real-time alerts. Andel's FloodAlert, for example, links sensor data with weather forecasts and soil conditions, enabling early warnings of flood risk. This data-rich approach reduces response times and helps build long-term resilience against climate-driven challenges.

Technology in this sector is no longer just about preventing immediate damage; it is about sustainability, resource efficiency and risk reduction. By preventing waste, minimising downtime and reducing environmental impact, the latest innovations are helping to align broader sustainability and net zero goals.

Malcolm Wilson, UK sales and marketing director, BCP Energy
bpc-ups.com

Real impact lies not only in product claims, but also in how we operate as a company and support our clients in meeting their net zero goals

Q: How is your organisation helping clients meet their net zero and sustainability goals?

A: BPC Energy recognises that sustainability is not optional – it's integral. While uninterruptible power supply (UPS) systems have become increasingly energy efficient, we believe real impact lies not only in product claims, but also in how we operate as a company and support our clients in meeting their net zero goals. As a smaller organisation, our direct environmental footprint is modest, but we see this as an opportunity, not a limitation.

Through engagement with the Supply Chain Sustainability School (SCSS), we're committed to driving best practices in areas such as responsible sourcing, carbon measurement and ongoing education. This helps us embed sustainability thinking across all stages of project delivery. We have applied to be gold members on the SCSS.

In May, we completed our ISO 14001:2015 certification, designing and implementing an environmental management system to continually improve our environmental performance. We are also developing a carbon-reduction plan, which is due to be released in Q4.

We support our clients by focusing on

system efficiency, right-sizing and life-cycle thinking. Rather than overspecifying, we work with building services engineers to ensure UPS systems are optimised for their exact and actual needs, reducing energy waste and operational emissions.

Beyond our product ranges, we're working on making our CPD content more reflective of this approach. Our updated CPD sessions explore the intersection of resilience and sustainability in power systems, and how even small changes in design and procurement decisions can scale up to make a measurable difference.

Meaningful sustainability outcomes come from collaboration, transparency and action. If every company takes responsibility for their slice of the carbon pie, the industry will move closer to net zero.

John Florence, engineering manager, Dutypoint
dutypoint.com

Our mission is to provide smarter pumping solutions that work for today while protecting resources for the future

Q: What role can intelligent water management and pump system design play in reducing a building's overall energy and water footprint?

A: Dutypoint believes intelligent water management and pump-system design should deliver more than just reliable performance. Done right, they can reduce energy use, cut running costs and make a real difference to a building's sustainability footprint.

It starts with correct pump selection. Our team focuses on optimising every choice to operate as close as possible to the best efficiency point. This means pumps work at peak efficiency, avoiding waste and extending their lifespan.

We then take performance further with high-efficiency applications. Our VRX range, fitted with IE5 motors, represents the highest efficiency class available for electric motors. When combined with variable speed drives, pumps only run at the speed the task requires. This avoids constant full-power operation, reduces mechanical stress and delivers major energy savings, with even a small reduction resulting in large power savings.

Smart control is another vital piece. We design tailor-made control philosophies that use sensors to monitor

water levels, pump speed and system demand. This ensures equipment runs safely and efficiently, while protecting the pumps themselves. By adding pressure vessels, systems can absorb short bursts of usage, such as a tap running for 30–60 seconds, without needing to start the pumps immediately.

All of these measures contribute to a lower total cost of ownership (TCO). Less energy, fewer repairs, reduced downtime and longer equipment life mean significant financial savings over time. A lower TCO supports sustainability goals and strengthens an organisation's competitive edge. Our mission is to provide smarter pumping solutions that work for today while protecting resources for the future.

Oliver Clements, managing director, Future Designs
futuredesigns.co.uk

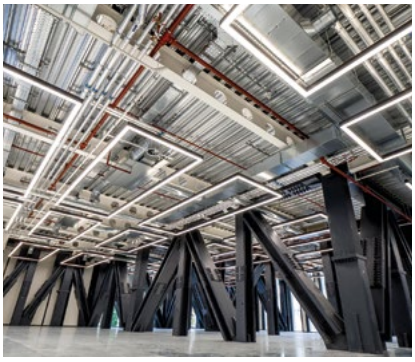
A key element of this strategy involves reusing existing luminaires rather than producing new ones

Q: What is Future Designs' strategy for reducing the carbon footprint of its products – from manufacturing and materials to end-of-life disposal?

A: Future Designs has developed comprehensive strategies to reduce the carbon footprint of its products across their entire life-cycle. Central to this approach is its Carbon Careful initiative, which prioritises reuse over remanufacture, significantly cutting emissions and raw-material consumption.

A key element of this strategy involves reusing existing luminaires rather than producing new ones. By reusing luminaire carcasses and upgrading internal components to the latest LED technology, Future Designs significantly reduces waste and carbon usage. To date, the company has upgraded more than 4.6 million square feet of office and educational space in the UK through this method.

In a recent office-tower project in central London, for example, more than 6,000 fluorescent light fixtures, originally supplied 14 years before, were reworked and reused. This alone prevented 7.9 tonnes of mild steel from being manufactured, which would have required the extraction of 155 tonnes of raw materials from the planet's crust.



Future Designs has also launched the Return to Reuse programme, which offers a fully traceable recycling and reuse service for end-of-life Future Designs luminaires. Initially, this covers the popular VANE multi-use system, which is installed across a vast number of projects in the UK, Europe, the United Arab Emirates and Saudi Arabia. The scheme ensures luminaires are either reused under Carbon Careful or recycled responsibly.

Through Carbon Careful and Return to Reuse, Future Designs is setting a benchmark in the lighting industry for responsible manufacturing, material efficiency and circular economy practices, actively reducing environmental impact at every stage of the product life-cycle.

James Griffiths, head of projects, GF Building Flow Solutions
uponor.com

It has never been clearer that heat pumps are the low carbon heating solution that will suit the largest number of UK homes

Q: What role does low-temperature heating and modern pipework play in the shift towards heat pump adoption?

A: It has never been clearer that heat pumps are the low carbon heating solution that will suit the largest number of UK homes. However, many people are still unsure about the technology, often because of stories of systems that do not perform as intended – usually because of poor or unsuitable installation.

It is now increasingly well understood that, because of the low-temperature nature of heat pumps, their effectiveness relies on good insulation of the building envelope and the correct type and sizing of heat emitters. The most effective option is typically underfloor heating (UFH), because of the large surface area.

There is often a perception that UFH is not an option for many retrofit properties. However, with low-profile solutions such as Uponor Minitec, which requires a floor height increase of just 16mm, UFH is suitable to be installed in more existing properties.

By extension, this means that heat pumps are a viable option for a wider range of homes and businesses.

Additionally, the correct choice of pipework, especially for monobloc heat

pumps, is an essential – but sometimes overlooked – factor in ensuring that system performance is optimised and can deliver the required heat output.

Monobloc air source heat pumps offer a straightforward installation process that has seen them used in a wide variety of new builds and retrofits. However, with the refrigerant contained in the outdoor unit, and the system water flowing between the indoor and outdoor unit, heat losses from underperforming pipework can impact the performance.

A higher level of insulation can often be achieved by opting for a pre-insulated pipe solution. For example, products from the Uponor Ecoflex range of pre-insulated pipe achieve lambda values as low as 0.004W/mK.

Chris Caton, product director – commercial, Groupe Atlantic UK, ROI & NA
idealcommercialheating.com

Working with engineers at an early stage is more likely to result in a smooth-running project

Q: How does Ideal Heating help engineers choose the most appropriate heat pump for sustainable, long-term performance?

A: It's important that the product range is there, along with quality. Our Ecomod range of commercial air source heat pumps (ASHP) is available with natural refrigerants, in outputs from 15kW to 130kW, and can be cascaded to achieve higher outputs. This allows the most appropriate equipment to be selected.

Guiding an engineer to find the most suitable heat pump for a project requires a focus on three interdependencies: refrigerant choice, temperature capabilities and efficiencies.

The performance, environmental impact and cost of running a heat pump can hinge on refrigerant choice. Global warming potential (GWP) is the benchmark for assessing a refrigerant's climate impact. The lower the GWP, the lower the contribution to climate change. The 2014 F-gas Regulation and, more recently, the EU's Regulation 2024/573 are pushing for a refrigerant phase-down, promoting the use of low-GWP alternatives.

The Ecomod range is available with R32 refrigerant, which has a low GWP of 675, and natural refrigerants R290 and R744, which have ultra-low GWPs of 3 and 1 respectively.

Different refrigerants have different temperature capabilities. R32 systems produce flow temperatures up to 55°C, whereas R290 can deliver temperatures up to 75°C. However, running at higher temperatures can mean higher costs.

Helping engineers to understand these interdependencies and how to achieve operational efficiency is at the core of what we do. We aim to understand the building type and requirements – including electrical supply, clearances and temperature profiles for the heating system – and then provide the engineer with suitable options.

Working with engineers at an early stage is more likely to result in a smooth-running project.

Paul Barnard, technical sales engineer, IWTM-UK
IWTM-UK.com

Together, these electrochemical water treatment methods minimise the common causes of HVAC inefficiency and failure

Q: How can non-chemical water treatment systems help building operators reduce maintenance and prolong the lifespan of HVAC assets?

A: Electrochemical chemical-free water treatment systems, such as those using sacrificial magnesium anodes and ion-exchange resin technologies, offer building operators an effective way to reduce maintenance and maximise the lifespan of HVAC assets without relying on traditional chemical treatments.

Sacrificial magnesium anodes work through anodic protection. They consume the dissolved oxygen to very low levels, protecting critical metal components in HVAC systems – such as pipes, condenser tubes and heat exchangers – from corrosion. This helps prevent leaks, pinhole failures and damage caused by galvanic corrosion. As a result, equipment experiences less wear, reducing repairs and replacements.

Ion-exchange resin systems remove scale-forming ions such as calcium and magnesium from water by replacing them with non-scaling ions, such as hydrogen and hydroxyl. This prevents scale buildup on heat-transfer surfaces. Without scale, HVAC systems maintain optimal thermal efficiency, consume less energy and require fewer

cleanings or acid washes. Together, these electrochemical water-treatment methods minimise the common causes of HVAC inefficiency and failure: corrosion and scale.

Chemical-free water treatment requires permanent equipment installed in the plantroom and always on, passively controlling oxygen ingress and treating makeup water. It reduces the frequency of maintenance interventions, maximises the service life of high-value assets and helps maintain system performance.

This means lower operating costs, fewer system disruptions and a longer return on HVAC investments, while avoiding the risks and complexities of handling hazardous chemical inhibitors, biocides or cleaning products.

James Miles, technical manager, Kingfisher Lighting
kingfisherlighting.com

Lighting control is a key element in reducing the impact of lighting on the environment

Q: How is lighting design adapting to demands for energy efficiency, biodiversity protection and smart city integration?

A: Kingfisher is committed to minimising our impact on the environment with all aspects of our product development.

We have a lot of industry contact with bodies such as the Institution of Lighting Professionals and the Lighting Industry Association, sitting on technical panels and contributing to guidance documents relating to ecology and sustainability.

We also consult with university researchers and conservation groups. Our goal is to take this knowledge and have it influence the direction of product development and the way we approach lighting exterior spaces.

Kingfisher was one of the first companies to offer 2,700k light sources from stock and we now offer a range of bespoke solutions to minimise the impact of lighting on wildlife.

We are able to offer: dim to warm, to make spaces less obtrusive when pedestrian use is low; single-spectrum amber, to cut out blue spectrum for mammals; green, for nocturnal migrating birds; and Red 610, which has been

proven to limit the impact of lighting on bats.

Equally, lighting control is a key element in reducing the impact of lighting on the environment, both directly – for wildlife – and indirectly with energy consumption.

These can range in scale from simple additions, such as part night dimming and stand-alone motion sensor-enabled fittings, to full wireless central management systems.

Understanding the needs of the client and how the space will be used is key to ensuring the right system is selected, to achieve the balance between a usable space and maximising the energy savings.

Robert Williamson, country leader UK&I, technical insulation , Paroc
paroc.com/en-gb

Sustainability remains a major driver of innovation

Q: What trends are currently driving innovation in insulation materials?

A: There are several key trends in the UK and Ireland, particularly in response to evolving regulations, increased safety demands and sustainability.

First, stricter Building Regulations in the UK, such as those introduced under the Building Safety Act 2022 and updated Part L and Part B, are pushing the industry to prioritise fire safety and thermal efficiency. In recent years, there has been a focus on using non-combustible or fire-resistant insulation materials in high-rise and multi-occupancy buildings. This has led to the development of safer, more robust insulation solutions that meet rigorous performance standards.

Second, sustainability remains a major driver of innovation. In the EU, buildings are responsible for approximately 40% of total energy consumption. Improving insulation is one of the most cost-effective ways to reduce this, helping to achieve energy efficiency and carbon-reduction targets. As a result, there's also growing demand for high-performance insulation products.

There's also a noticeable shift towards circular economy principles, encouraging

the creation of insulation materials that are easier to reuse, recycle or repurpose at the end of their life-cycle.

Global initiatives such as Breaam and Leed building standards go even further to assess the whole building's ongoing environmental impact, and Environmental Product Declarations can help you specify the most effective insulation.

Online specification tools, such as the Paroc Calculus, take energy loss into account to help specifiers design the most energy efficient insulation combinations.

In summary, innovation in insulation materials is being shaped by a convergence of tighter safety regulations, the urgent need for energy efficiency, and sustainability and life-cycle impact.

Craig Meakin, sales director, Philip Payne
philippayne.co.uk/contact

By manufacturing in the UK, we reduce transport emissions, shorten supply chains and support regional economic sustainability

Q: What is impacting emergency lighting strategies in buildings?

A: Sustainability is now one of the most significant factors shaping emergency lighting strategies. The way products are designed, sourced, installed and maintained is increasingly judged not just on performance, but also on environmental impact.

Providing credible carbon data is gaining momentum. CIBSE's TM65 methodology offers a clear framework for assessing embodied carbon where Environmental Product Declarations are not available. Independent verification of these calculations increases confidence in products for specifiers who need transparency and accountability.

Local sourcing is another important element. By manufacturing in the UK, Philip Payne reduces transport emissions, shortens supply chains and supports regional economic sustainability. More than 97% of its products are made in Britain, meaning environmental benefits are matched by practical advantages, such as reduced lead times and reliable delivery.

Longevity also plays a key role. Extending product life-cycles through high-quality engineering and robust

warranties helps minimise waste and replacement cycles. Philip Payne's six-year product and battery warranty – backed by advanced lithium battery technology – offers specifiers confidence that solutions are dependable and resource-efficient.

Finally, retrofit options offer a sustainable route for modernisation. Upgrading emergency lighting with LED components and new control gear reduces energy use and enhances compliance, while reusing housings and wiring avoids waste.

By focusing on verified product credentials, local manufacturing, long-life reliability and retrofit-friendly solutions, manufacturers help designers and building operators meet their environmental goals without compromising safety.

Martin Killen, CEO, Recotherm
recotherm.co.uk

Without proper ventilation, moist air condenses on cold surfaces, leading to corrosion and long-term structural damage

Q: How can integrated air handling units and heat-recovery systems improve indoor pool air quality while meeting energy performance standards?

A: Swimming pool halls are among the most complex environments to ventilate effectively. In addition to meeting the standard HVAC requirements of fresh air supply and temperature control, designers must also manage high humidity, caused by water evaporation, and deal with the airborne chemical byproducts.

Most pools are treated with chlorine, which reacts with organic contaminants such as sweat and urine to form chloramines, primarily dichloramine and trichloramine. These compounds are responsible for the strong 'chlorine' smell often associated with pool halls. In reality, that odour signals a buildup of irritants that can cause discomfort and even respiratory issues if not removed adequately by ventilation.

Without proper ventilation, moist air condenses on cold surfaces, leading to corrosion and long-term structural damage. Chloramine-laden air is especially corrosive to carbon and stainless steel components. Managing this requires a system that not only ventilates,

but also carefully controls internal humidity.

Older systems relied on full fresh air ventilation; however, this approach sacrifices humidity control and dramatically increases energy costs.

The modern, more efficient strategy is to use controlled fresh air ventilation systems with heat recovery. These systems regulate humidity levels while reducing operational costs significantly by recovering heat from the extract air.

By combining air-quality management, moisture control and energy efficiency, a well-designed pool hall ventilation system protects occupants and the building fabric, while keeping energy use to a minimum.

Ian Davis, technical manager,
S&P Ventilation Systems
solerpalau.com/en-en

We are working closely with CIBSE to provide fully verified TM65 data for our product portfolio

Q: How are you responding to growing demand for low-energy ventilation?

A: At S&P Ventilation Systems, the UK division of the Soler & Palau Ventilation Group, we recognise that the demand for low-energy ventilation now extends well beyond day-to-day efficiency.

The industry is increasingly focused on whole life carbon performance, requiring manufacturers to demonstrate accountability not only for energy consumption during operation, but also for the embodied carbon associated with design, manufacture and end-of-life processes. To meet this challenge, we are working closely with CIBSE to provide fully verified TM65 data for our product portfolio. TM65 is the recognised industry methodology for calculating embodied carbon in building services equipment.

By undergoing CIBSE certification, we ensure our data is independently assessed, robust and comparable across manufacturers. This gives consultants, specifiers and sustainability professionals the confidence to include S&P products in carbon-conscious building designs, with accurate, evidence-based information.

This initiative builds on our long-standing commitment to energy efficiency. Our in-house design and manufacturing

capability enables us to optimise every component – from EC 'brushless' motors and advanced impeller geometries to thermal wheels and housings – to achieve the best possible balance of performance and efficiency. Pairing this engineering expertise with verified embodied carbon data demonstrates our holistic approach to sustainability.

By aligning with CIBSE and the TM65 framework, we are contributing to greater transparency and accountability within the ventilation sector. Our goal is to support consultants, contractors and building owners in achieving low carbon outcomes — delivering solutions that perform efficiently, responsibly, and in line with the UK's broader net zero ambitions.

Josh Emerson, sales and marketing director, Swegon
swegon.com/uk

Tools such as Swegon Smart Link + exemplify how data connectivity makes the invisible visible

Q: How is data and system connectivity changing the HVAC systems throughout the building life-cycle?

A: It is transforming HVAC systems by making them smarter, more adaptive and more efficient.

In the design and construction phase, we use BIM, which is software used to create collaborative design and build processes. We also have digital twins, a virtual replica of the physical environment.

Enhanced capabilities available for BIM and digital twins enables teams to simulate scenarios, compare predicted versus actual performance, and ensure HVAC systems are designed with life-cycle efficiency in mind.

In the operation and maintenance phase, connected solutions enable continuous optimisation. Systems such as Swegon WISE dynamically adjust indoor climate in real time, ensuring comfort at the lowest life-cycle cost. Its water optimisation feature alone can cut energy use by up to 15%.

Tools such as Swegon Smart Link + exemplify how data connectivity makes the invisible visible. Connecting HVAC units with monitoring platforms provides insights into performance, usage patterns and potential issues,

allowing predictive maintenance and informed decision-making.

Connectivity also allows HVAC to integrate external data streams such as weather forecasts or electricity tariffs, enabling proactive adjustments that anticipate solar heat gain, shift loads to off-peak hours or reduce demand during high-cost periods, optimising performance and sustainability.

HVAC systems are evolving from isolated, reactive systems into connected, predictive and life-cycle-orientated ecosystems. With these solutions, Swegon demonstrates how buildings can achieve better comfort, lower energy use and reduced environmental impact throughout their entire life-cycle.

Katerina Budinova, director, product division, Woods Air Movement
woodsairmovement.com

The solution lies in systems that respond intelligently to occupancy and air-quality data

Q: How can building services deliver both energy efficiency and high indoor air quality (IAQ) in intermittently occupied spaces?

A: One of the biggest challenges in building services is delivering excellent IAQ without wasting energy in spaces that are not occupied continuously. Meeting this challenge requires smart, flexible ventilation strategies supported by the right fan technology.

In intermittently occupied environments, traditional always-on ventilation leads to unnecessary energy use. However, simply switching systems off when a space is empty can compromise IAQ when people return. The solution lies in systems that respond intelligently to occupancy and air-quality data.

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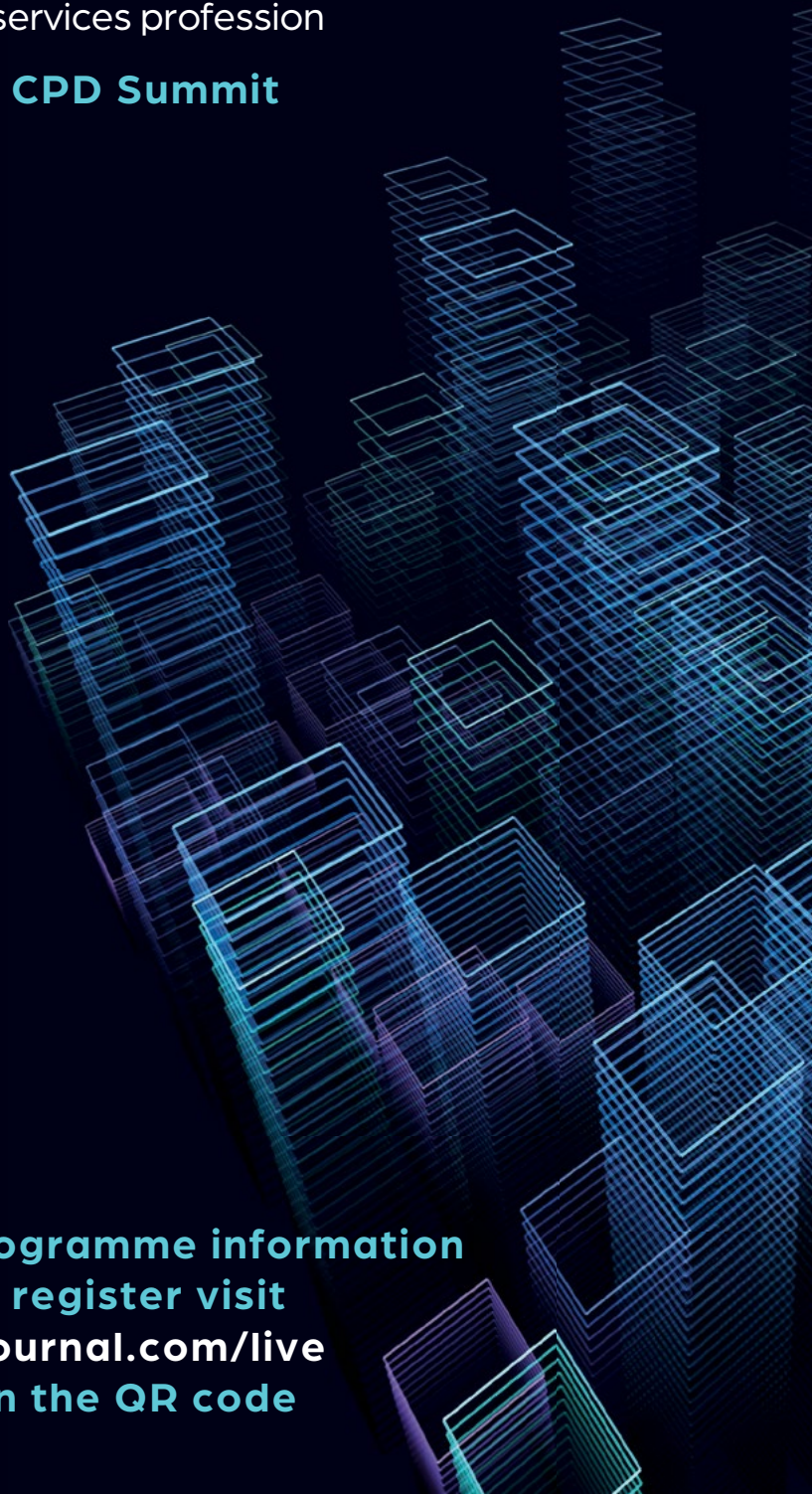

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CPD programme
Water treatment

Chemical-free water treatment in closed-loop systems

This module considers the application of chemical-free water treatment principles in closed-loop heating and cooling networks

This CPD article builds on the March 2024 *CIBSE Journal* CPD module 230, which introduced the basic principles of chemical-free water treatment (CFWT) and the operation of demineralisation and reaction-tank systems. This module now examines the wider application of those principles across the commissioning, operation and conversion of closed-loop heating and cooling networks, drawing on the new Commissioning Specialists Association (CSA) Technical Memorandum 20 (TM20).

CFWT has matured from a promising alternative into an engineering-led method that aligns with current European and UK practice for closed-loop heating and cooling systems. The fundamental challenge is that water is never just water. Left untreated, it can carry oxygen, dissolved salts and ions – such as chlorides, sulphates and nitrates – minerals, microbes and dissolved carbon dioxide that can slowly impact the longevity of system components designed for long operational lifetimes. Even small deviations in water quality can set off a chain of consequences: corrosion that produces sludge and pinhole leaks; scale that lowers efficiency and increases pumping energy; and microbiological growth that fosters biofilms and microbially induced corrosion (MIC). Chemical inhibitors, dispersants and biocides have historically been the conventional remedy, coating metal surfaces, suppressing microbes and controlling scale. But chemicals bring their own challenges, with the need for regular dosing, testing and replacement, safety risks in handling and storage, incompatibility with materials or microbes, and environmental consequences when discharged.

Stable and protective environment

CFWT aims to create a stable and protective water environment without introducing additives. Instead of relying on films and inhibitors, CFWT manages the fundamental variables that drive corrosion and fouling – dissolved oxygen, electrical conductivity and pH balance. When these three parameters are controlled within defined limits, the water becomes naturally benign to system materials. This philosophy underpins the new CSA TM20,[1] which establishes guidance for the design, commissioning and maintenance of CFWT systems in closed-loop heating and cooling networks. The new guidance aligns with European frameworks such as VDI 2035[2] for heating and VDI 6044[3] for cooling, together with BS EN 12828[4] for system design, and complements existing UK documents, including BSRIA BG 29[5] and BG 50[6], and CIBSE CP1 Heat Networks: Code of Practice.[7]

Corrosion is a key issue with closed-loop hydronic systems. It is the natural tendency of metals to revert to their stable, oxidised state – rust in steel and tarnish in copper. In heating and cooling loops, the rate of this reaction is accelerated by several factors. The most significant is dissolved oxygen, a potent oxidising agent that fuels electrochemical reactions. The second is the concentration of dissolved salts and minerals, reflected by the water's electrical conductivity, which determines how easily ions can carry charge between anodic and cathodic areas. The third is pH, as acidic or excessively alkaline water destabilises protective oxide films. These three form the causal trinity of corrosion. Added to these are the effects of temperature, velocity and microbial activity, particularly from sulphate-reducing and nitrite-reducing bacteria that thrive when nutrients such as sulphates or nitrites are available.

Demineralisation and electrochemical oxygen scavenging

Traditional inhibitor regimes attempt to slow these processes by forming protective films and suppressing microbial growth. CFWT takes a different approach. Rather than compensating for corrosion, it eliminates the conditions that make it possible.

In practice, CFWT relies on two complementary technologies – demineralisation and electrochemical oxygen scavenging. In the first, ion-exchange resins remove dissolved salts and minerals from fill and make-up water. Cation resins exchange positively charged ions such as calcium and magnesium for hydrogen ions, while anion resins exchange negatively charged ions such as chlorides, sulphates and nitrates for hydroxide ions. The result is water that is low in conductivity (typically below 100µS·cm^{-1}) and free from hardness and most nutrients that bacteria require. This demineralised water is poor at conducting electricity and does not support limescale deposition.

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The second technology is the reaction tank, which carries out electrochemical oxygen scavenging. The tank houses sacrificial magnesium anodes mounted within a stainless-steel body and filter assembly that act together as an electrochemical cell. When oxygen is present, the magnesium preferentially corrodes, consuming oxygen and producing magnesium hydroxide, which raises and stabilises the water at a slightly alkaline pH. In oxygen-free conditions, the anodes lie dormant and can last for several years. When oxygen enters through make-up water or maintenance, the reaction automatically restarts, maintaining equilibrium (as indicated by the area bounded by the white dashed lines in Figure 2) without chemical dosing.

The demineralisation and reaction-tank arrangement were described in *CIBSE Journal* CPD module 230, and remains at the heart of the system. In essence, the process water passes through a mixed-bed resin vessel to remove ions before circulating through a stainless-steel side-stream reaction tank fitted with magnesium anodes, filters and an air vent. Together, they continuously remove oxygen, gas bubbles and fine debris, stabilising both the chemistry and micro-environment of the circuit.

The conditions promoted through CFWT are already embedded in European practice. VDI 2035 and VDI 6044 specify the same goals – low dissolved oxygen, low conductivity and a mildly alkaline pH – as the preferred means of preventing scale and corrosion, without reliance on inhibitors. BS EN 12828 and many manufacturer warranties now echo these targets. In the UK, BG 29 and BG 50 focus on verifying water quality rather than residual chemical concentrations, and CIBSE CP1 reinforces the importance of controlled filling and monitoring. TM20 extends these principles into a defined process for both new installations and legacy conversions, giving engineers a consistent language for specifying and commissioning chemical-free systems.

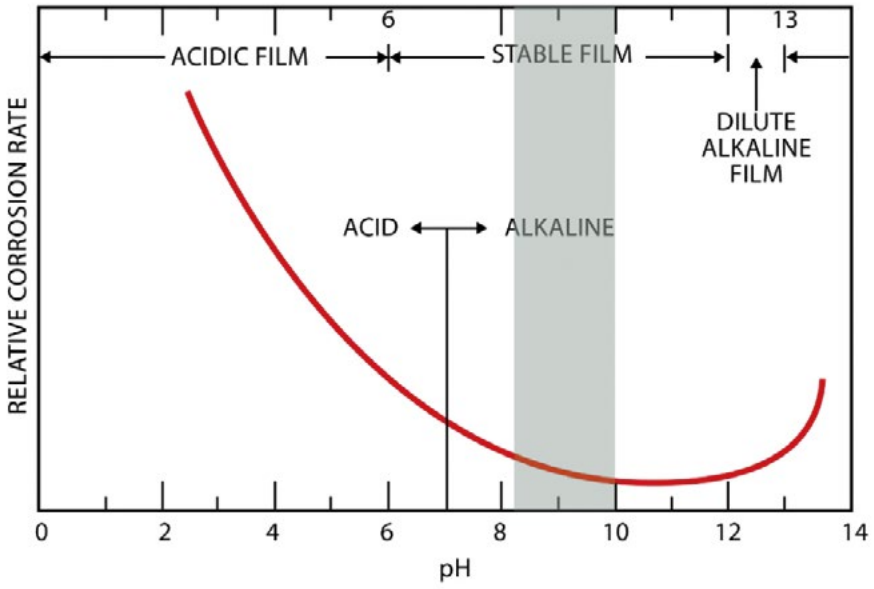

Figure 1: Chemical-free water treatment (CFWT) aims to adjust the water's pH so that it is slightly alkaline, within the range 8.2 to 10. This helps prevent corrosion by making the environment less conducive to the corrosive reactions detailed above

New systems

For new systems, the conditions of the initial fill are critical. TM20 follows the familiar sequence of BG 29 but changes the chemistry: fill slowly and methodically from the lowest point with demineralised water that has low bacterial levels and controlled pH, produced by mobile mixed-bed units that also remove carbon dioxide. The aim is to prevent trapped air, as even small oxygen pockets can localise corrosion. Dynamic cleaning then circulates the water at velocities high enough to mobilise debris, using either full-flow or side-stream filtration (as discussed in *CIBSE Journal* CPD module 230). TM20 suggests a minimum of the BG 29 values or the design velocity plus 10%, whichever is greater. Differential pressure gauges across filters help indicate when cartridges need replacement, avoiding unnecessary shutdowns.

Once debris has been removed, a polishing phase brings conductivity below the 100µS·cm^{-1} benchmark using resin filtration. The cleaned and de-aerated water is then ready for circulation. The principle is that once wet, the system is kept wet. Systems filled with demineralised water should not be drained, as draining reintroduces oxygen and resets corrosion potential. TM20 recommends sampling and laboratory verification at each stage to confirm that physical parameters meet target values. Onsite testing should be used for routine checks, supported by laboratory analysis for confirmation, ensuring a rapid workflow without compromising quality assurance.

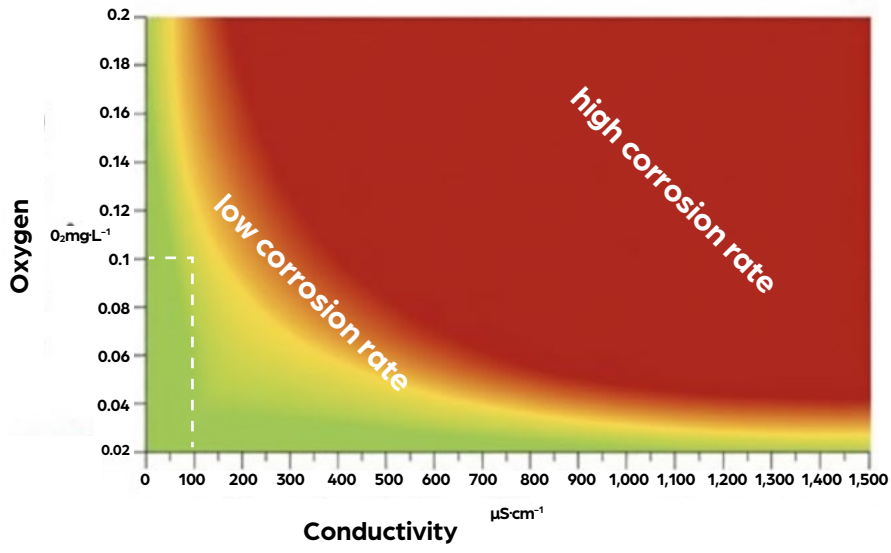

Figure 2: Maintaining a balance between oxygen levels and conductivity to prevent corrosion (Source: TM20)

Existing systems

For existing systems already operating under chemical regimes, CFWT can be introduced progressively. Progressive system improvement is less disruptive than a complete system renewal and often preferred where continuous service is required. In this approach,

demineralisation and reaction tanks are installed as side-stream devices, using either existing system pumps or a small integral pump to maintain circulation. Over several weeks, dissolved oxygen is consumed, pH stabilises and conductivity gradually falls as contaminants are filtered out. Filter cleaning and periodic blowdown (the controlled discharge of a small volume of system water) helps maintain water clarity and prevents the build-up of corrosion products and magnesium hydroxide, keeping the system clean and stable. TM20 acknowledges that achieving the same conductivity targets as for new systems may not always be realistic, but if oxygen and pH are well controlled, slightly higher conductivity is acceptable because the water corrosivity is low. The optimal range for pH control is shown in Figure 1.

Environmental conditions

Microbially-induced corrosion often arises from sulphate-reducing bacteria (SRB) that produce hydrogen sulphide, which pits steel, and nitrite-reducing bacteria (NRB) that generate ammonia, which attacks copper alloys. These organisms depend on specific environmental conditions – SRB require sulphates and thrive under anaerobic, low-pH conditions, while NRB need nitrites and oxygen. CFWT suppresses both by removing nutrients through demineralisation and maintaining an oxygen-poor, alkaline environment. The reaction tank consumes oxygen and elevates pH into a range (typically 8.5-9.5) that is unfavourable to both species. In new systems, this prevents colonisation; in existing ones, bacterial counts gradually decline as the water becomes inhospitable. TM20 advises using total viable count (TVC) and SRB testing as practical indicators during transition, as NRB are more difficult to measure directly.

In CFWT applications, operators monitor three parameters – conductivity, pH and dissolved oxygen – using handheld or inline meters. Ion-exchange resins are replaced when conductivity rises above the agreed threshold, and magnesium anodes typically last about three years in well-sealed systems. Regular blowdowns and filter cleaning remove sludge and magnesium hydroxide residues. Inline galvanometers or visual indicators on reaction tanks reflect the anode status. The maintenance cycle is typically predictable.

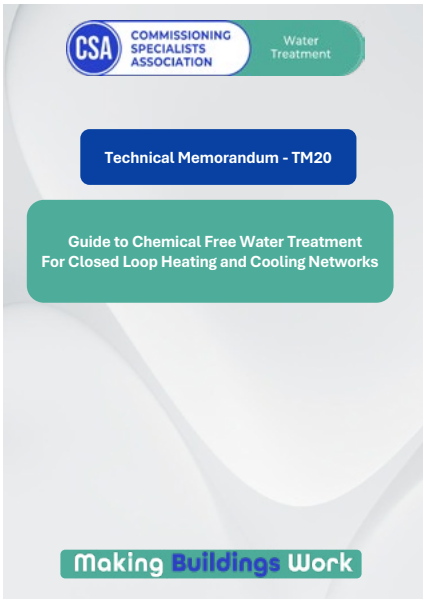

Figure 4: The Commissioning Specialists Association Technical Memorandum 20 (TM20) offers the latest guidance on CFWT

Reducing risks

CFWT eliminates the handling, transport and disposal of hazardous chemicals, reducing risks to health, safety and the environment. It also removes the uncertainty of chemical interactions, and the carbon impact associated with inhibitor production and delivery. Systems operating under stable, low-conductivity conditions have been demonstrated as having improved heat-transfer efficiency and lower maintenance costs. From an operational perspective, CFWT simplifies compliance with environmental standards and sustainability goals.

As with any engineered process, CFWT depends on good design and disciplined commissioning. Loops must be properly vented, leak-tight and free-flowing; stagnation or air ingress will defeat any treatment method. Legacy systems may need patience while residual chemistry decays and the conductivity stabilises. Consumables such as resin and anodes require routine attention. Yet, with these understood, CFWT has proved robust in diverse applications, including hospitals, data centres and district energy networks.

Mainstream standard

CFWT is well positioned to move from alternative practice to the mainstream standard. In parts of Europe it is already the norm, supported by frameworks such as VDI 2035 and 6044. In the UK, the publication of CSA TM20 provides a significant milestone, mirroring the influence that BSRIA BG 29 once had on conventional chemical treatment. By establishing a unified process and clear water-quality benchmarks, TM20 gives specifiers and operators a consistent basis for design, commissioning and maintenance.

For engineers and system operators, CFWT represents a practical evolution in closed-loop water management. By addressing the root causes of corrosion and fouling through controlled water chemistry, it offers an opportunity to maintain stable, low-risk operation while reducing environmental impact and simplifying maintenance requirements. ●

Figure 3: Example of a mobile demineralisation unit that can be installed in line with the mains water supply and the system connection. This process effectively removes minerals and salts, while also raising the pH to optimal levels. A resin used in this particular unit removes carbon dioxide and raises the water pH (Source: IWTM)

Module 257

November 2025

1. Which three parameters are primarily targeted in chemical-free water treatment to prevent corrosion in closed-loop systems?

- ☐ A Alkalinity, pressure and total dissolved solids
- ☐ B Dissolved carbon dioxide, ammonia and nitrite
- ☐ C Dissolved oxygen, conductivity and pH
- ☐ D Flowrate, microbiological count and turbidity
- ☐ E Temperature, velocity and hardness

2. In new systems, TM20 recommends filling with demineralised water because it:

- ☐ A Contains biocides that control bacteria
- ☐ B Provides a protective chemical film on pipework
- ☐ C Raises conductivity to prevent electrostatic charge buildup
- ☐ D Reacts with magnesium to increase heat-transfer efficiency
- ☐ E Reduces dissolved oxygen, hardness and nutrients from the outset

3. During transition of an existing system to CFWT, slightly higher conductivity may be accepted provided that:

- ☐ A Additional inhibitors are dosed to compensate
- ☐ B Dissolved oxygen and pH are controlled within the target range
- ☐ C Sulphates are added to stabilise bacterial activity
- ☐ D The pH remains below 7.0 to inhibit scale
- ☐ E The system is drained and refilled weekly

4. CFWT suppresses sulphate-reducing and nitrite-reducing bacteria mainly by:

- ☐ A Maintaining a neutral pH and high conductivity
- ☐ B Maintaining a constant high temperature
- ☐ C Periodically shocking the system with chlorine dioxide
- ☐ D Removing their nutrient sources and creating an oxygen-poor, alkaline environment
- ☐ E Using ultraviolet sterilisation

5. Compared with traditional chemical regimes, CFWT offers which of the following key operational benefits?

- ☐ A Eliminates the need for monitoring any water parameters
- ☐ B Extends anode life indefinitely without maintenance
- ☐ C Increases total dissolved solids for improved corrosion resistance
- ☐ D Provides certainty through daily laboratory analysis to maintain control
- ☐ E Reduces environmental and safety risks associated with handling and disposal of treatment chemicals

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References:

[1] Commissioning Specialists Association (CSA) *Technical Memorandum 20: Guide to chemical-free water treatment for closed-loop heating and cooling networks'*, CSA July 2025.

[2] *VDI 2035 – Prevention of damage in water heating installations – Scale formation and waterside corrosion*, VDI 2021.

[3] *VDI 6044 – Prevention of damage in cold and cooling water circuits*, VDI 2023.

[4] *BS EN 12828:2012+A1:2014 – Heating systems in buildings: design for water-based heating systems*, BSI.

[5] *BSRIA BG 29/2021: Pre-commission cleaning of pipework systems (amended 6th edition)*, BSRIA 2021.

[6] *BSRIA BG 50/2021: Water treatment for building services systems*, BSRIA 2021.

[7] *CIBSE CP1: Heat networks – Code of Practice for the UK (2nd edition)*, CIBSE 2020.

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Resideo (Ademco 1)
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www.viega.co.uk

Viking
www.viking-emea.com

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www.zencontrol.co.uk

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www.zetaservices.co.uk

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CPD programme
Heat networks

The optimisation of substations and consumer systems in the new Heat Network Technical Assurance Scheme

This module explores how the new HNTAS aims to ensure new and existing heat networks achieve minimum levels of performance and reliability

The UK government has an ambition for 20% of the nation's heat to be provided from heat networks by 2050 (up from 3% in 2024), as part of the nation's transition to net zero by 2050.[1]

Heat networks distribute heat or cooling from centralised sources to a variety of different customers, such as public buildings, shops, offices, hospitals and homes.

Whether supplying a few neighbouring buildings or entire cities, these centralised systems remove the need for individual boilers or heaters in each building connected.

A major appeal of heat networks is that they can take advantage of a wide array of different heat sources – including the recovery of low carbon heat from sources such as industry and data centres that would otherwise be wasted, along with naturally occurring sources, such as geothermal or rivers.

While the government's heat ambition is admirable, the problem is that many existing heat networks are, according to its research, operating 'sub-optimally', to the detriment of customers, 'particularly where networks operate at lower efficiencies and increasing fuel costs are passed through'.[2]

To support the delivery of net zero and ensure a more efficient energy system, the government introduced the Energy Act, which became law in 2023. This included powers for government 'to mandate heat network technical standards in Great Britain through regulations'.[3]

These regulatory technical requirements for heat networks are expected to be introduced in forthcoming regulation. In advance of this, the government will be publishing a mandatory Heat Network Technical Assurance Scheme (HNTAS), which aims to ensure new and existing heat networks achieve minimum levels of performance and reliability. It is aimed at parties engaged in planning, construction, management, operations and maintenance of heat networks. The HNTAS documentation, written by specialist energy consultancy FairHeat, will be phased in over time to ensure the sector has sufficient time to 'shape, understand and comply with the scheme'.

The first tranche of these documents has been published in draft form: there are overview documents covering the new build technical specifications and assessment procedures for the six major elements of a heat network: the energy centre; district distribution network; substation; communal distribution network; consumer connection; and consumer heat system.

This CPD sets out to describe the new HNTAS scheme and outline how, in particular, it is expected to work for heat interface units (HIUs) and substations.

The need for change

A fundamental change to the regulatory landscape is required for heat networks to achieve their decarbonisation potential. This is driven by the need for enhanced consumer protection, as customers connected to a heat network are obligated to use a single heat provider, contrasting sharply with the competitive market available to those using independent heat sources, such as heat pumps or gas boilers.

The new regulatory framework mandates reliable heat and hot-water supply at fair prices, a core measure the government anticipates will boost heat networks' appeal and drive market expansion. The mandatory HNTAS scheme is intended to ensure heat networks achieve minimum levels of performance. The government also expects that in a regulated sector, where standards are harmonised, heat networks will become a more attractive investment proposition for asset managers.

Energy regulator Ofgem will be responsible for regulating the sector and monitoring heat networks' compliance with the regulatory framework. Its role will

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include: managing the authorisation regime; ensuring compliance with consumer protections; and managing audits and enforcement activity where necessary.

Performance-based assurance

HNTAS is a performance-based assurance scheme. For each element, assessments against minimum standards are made at various life-cycle stages of a heat network. For example, in the design and construction stages, assessments will be made to validate the claims that certain performance outcomes will be achieved. Similarly, on commissioning, assessments will verify that performance outcomes have been achieved and maintained.

For new networks, an assessment pass will be required at three key gateway points in a heat network's life-cycle: before a network is allowed to start design; before starting construction; and before starting operation

An assessment pass will also be required after two years of operation to ensure that performance levels continue to meet requirements (see Figure 2).

Technical requirements

The first HNTAS technical specification documents[4] detail the technical requirements to be met for the six elements of a heat network; outline performance monitoring requirements; detail key failures to be avoided at each stage; and evidence requirements to be provided to demonstrate conformity with HNTAS and avoidance of key failures.

All technical requirements are derived from existing industry documentation. The primary reference is the CIBSE Code of Practice CP1 (2020), which provides the foundational technical standards for the regulations.[5] For topics not covered by existing industry documentation, additional technical requirements have been added to address these gaps.

A new Heat Network Technical Standard (HNTS) is being developed and will be published later this year. This will supersede CP1, and will be used as the predominant technical standard referenced in HNTAS.

Figure 1: District heating substations are available to meet a variety of sizes, scope and requirements

16 common reasons for the failure of legacy heat networks

1. **Insufficient consideration of heat network requirements at concept design stage**
2. **Incorrect sizing**
3. **Unnecessary complexity**
4. **Unsuitable hydraulic arrangement**
5. **Poor insulation specification and installation**
6. **Poor planning and civil works for underground pipework**
7. **Poor underground pipework installation**
8. **Insufficient monitoring and data collection**
9. **Inappropriate design and commissioning of consumer connection and/or heat system**
10. **Lack of consideration given to system pressures**
11. **Lack of consideration given to maintainability**
12. **Poor installation and commissioning practices**
13. **Inefficient control**
14. **Uncontrolled network flows**
15. **High return temperatures**
16. **Poor water quality**

KPIs

The HNTAS technical specification overview documents contain the key performance indicators (KPIs) to be achieved and maintained in operation for each element of a network. These build upon and formalise the KPI concepts outlined in CP1 (2020). While both documents emphasise the importance of performance monitoring, the HNTAS draft provides a more prescriptive and detailed framework for KPIs.

The KPIs are split into two types:

- **Assessed KPIs:** these are KPIs that are assessed against predetermined targets at commissioning, and throughout the operation and maintenance phase, in order to achieve and maintain HNTAS certification.
- **Reported KPIs:** these are KPIs that are not assessed against a predetermined target through the operation and maintenance phase, but still provide valuable information, so are to be reported in the same format.

As an example, the draft overview technical specification document for consumer connection (HNTAS-TS-CC-P0) lists 13 assessed KPIs. KPI 1 relates to the automatic remote monitoring system (ARMS) connectivity. It explicitly measures ARMS connectivity and data completeness, with set percentage targets given at the commissioning stage (100% connectivity) and the operation and maintenance stage (≥99% connectivity).

Assessment procedure

Alongside the HNTAS technical specification overview documents, the government has published six corresponding assessment procedure documents in draft form.[6] Each document details the activities to be undertaken to provide assurance that the obligations in the corresponding technical specification document have been fulfilled.

Further draft technical specifications and assessment procedures for new-build networks and for existing networks will be published at a later date. In total, there will be 34 technical specification documents published and 34 corresponding assessment procedure documents.

While a total of 68 documents may, at first, appear to be overwhelming, the documents are organised logically for each of the six elements, with subsequent documents corresponding to each phase of a heat network's development and operation for each element (see Figure 2).

In addition, there will be five supplementary specifications detailing the requirements for acceptance testing for the different elements. Final versions of all documents will be available once the scheme is live in 2026.

The optimisation of substations and consumer systems

With more than 50,000 HIUs being installed each year in the UK, setting performance standards has become increasingly important in supporting the deployment of low carbon heat networks. HIUs function as the critical interface between the heat distribution network and the consumer's heating system.

The Building Engineering Services Association (BESA) UK *HIU Test Regime* publication[7] aligns closely with the objectives and specific technical requirements of the draft HNTAS, particularly concerning the performance of

HNTAS assurance scheme

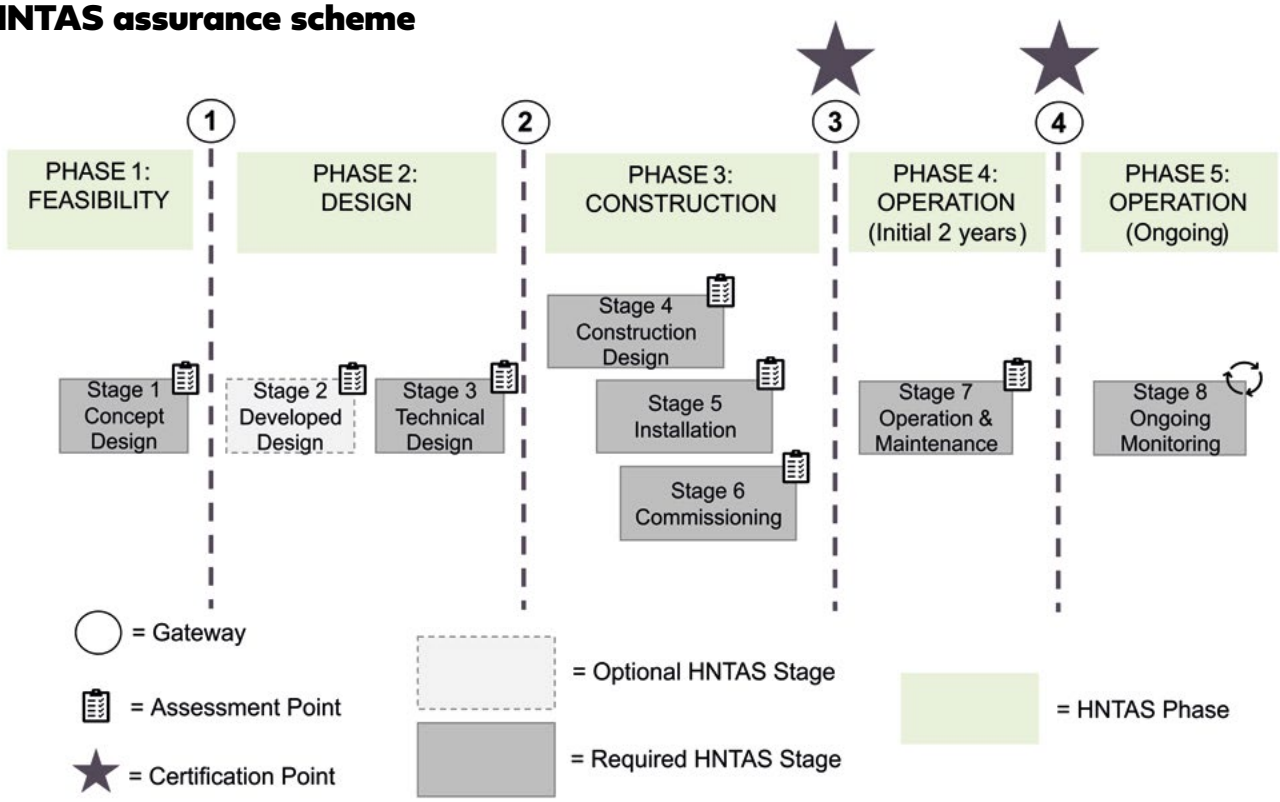

Figure 2: Diagram representing the phases of the HNTAS assurance scheme

consumer connection elements, which typically include HIUs.

The aim of the document is to introduce a pragmatic and practical way of testing and comparing HIUs, to provide a basis for assessing performance for those developing and designing heat networks.

The performance metrics defined in the BESA test standard align with the assessed KPIs set out in the draft HNTAS-TS-CC-P0 for volume weighted average return temperature (VWART) and standing heat loss.

The performance of substations, too, is important in optimising the performance of heat networks (see Figure 1). The substation provides the connection between the district heat distribution network and the consumer distribution network.

The document HNTAS-TS-SS-P0 specifies several KPIs to ensure a substation efficiently transfers heat and maintains predictable flow conditions. To assess these KPIs, substations must use a metering and monitoring system, which records data at least every five minutes for flow, temperature and pressure points, and at least every 30 minutes for heat meters and water meters. The required substation monitoring points are set out in HNTAS-TS-SS-P0.

Legacy systems

There are around 14,000 heat networks in the UK, but government-funded analysis over the past decade has revealed a myriad of issues affecting performance that risk undermining the government's goal of providing affordable, low carbon heat. The most frequent are listed in the panel '16 common reasons for the failure of legacy heat networks'.

Heat network customers are unable to shop around for alternative suppliers and many – especially those using older and less efficient networks – may be paying more for their heating as a result.

Under the HNTAS scheme, existing networks will have to meet (yet to be published) performance requirements. However, the government says there will be a 'significant' transition period to allow operators to ensure appropriate metering is in place to be able to prove performance. It also says the performance requirements for existing systems will be set at 'a more permissive level' than those for new networks, and that operators will 'be given time' to reach these.

The *Heat Network Optimisation Guide*,[8] published in 2023, is expected to be used as the basis for setting performance requirements for legacy systems. As such, it provides a standardised set of processes and approaches that anyone undertaking optimisation can use, with the aim of providing a minimum quality standard.

The guide recommends taking a four-stage phased approach: understand, stabilise, easy wins and continuous improvement. Once root causes have been understood, the stabilisation of a heat network should take place to improve performance and reliability. Easy wins can then be carried out that have short payback times but require more planning and design. The continuous improvement cycle is designed to enhance performance over a long period. It has four repeating stages – measure, analyse, test and implement.

The guide outlines KPIs for quantitative analysis of heat network performance using data from the building management system, heat meters and utility bills, which may form the basis of the HNTAS legacy system performance requirements.

HNTAS certification

Once a new or existing heat network has passed all assessments, it will be awarded a HNTAS certificate as evidence of compliance. The heat network operator will be required to 'regularly submit data' to a HNTAS digital portal to show that the network continues to meet the HNTAS KPIs. This should ensure that more heat networks run efficiently and help the technology support the delivery of net zero. ●

Module 258

November 2025

1. What is the UK government's heat network target for 2050?

- ☐ A 10% of the nation's heat from heat networks
- ☐ B 20% of the nation's heat from heat networks
- ☐ C 30% of the nation's heat from heat networks
- ☐ D 50% of the nation's heat from heat networks
- ☐ E 75% of the nation's heat from heat networks

2. What is a key risk for customers connected to existing heat networks?

- ☐ A They can easily switch to a cheaper supplier
- ☐ B They may face higher costs if the network operates inefficiently
- ☐ C They have access to multiple independent heat sources
- ☐ D They are guaranteed government subsidies for all bills
- ☐ E They can always install their own boilers without restrictions

3. Which of the following best describes the purpose of HNTAS?

- ☐ A To provide grants to heat network operators
- ☐ B To regulate electricity prices across the UK
- ☐ C To ensure heat networks meet minimum performance and reliability standards
- ☐ D To replace all domestic gas boilers with heat pumps
- ☐ E To privatise all heat networks

4. When are assessment passes required for new heat networks under HNTAS?

- ☐ A Only during initial concept design
- ☐ B Before design, before construction and before operation
- ☐ C Only after two years of operation
- ☐ D Only during commissioning and installation
- ☐ E Only during ongoing operation

5. Which of the following is part of the HNTAS performance monitoring requirements for substations?

- ☐ A Tracking energy centre staff attendance
- ☐ B Recording flow, temperature and pressure at specified intervals
- ☐ C Measuring customer satisfaction daily
- ☐ D Conducting monthly visual inspections of all pipelines
- ☐ E Reporting heat network financial performance

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References:

[1] UK heat networks: market overview – **bit.ly/CJNov25CPD41**.
[2] Heat Network Efficiency Scheme (HNES): overview – **bit.ly/CJNov25CPD42**.
[3] Heat Network Technical Assurance Scheme (HNTAS) – **bit.ly/CJNov25CPD43**.
[4] Heat Network Technical Assurance Scheme (HNTAS): technical specifications – **bit.ly/CJNov25CPD44**.
[5] CP1 Heat networks: Code of Practice for the UK (2020) – **bit.ly/CJNov25CPD45**.
[6] Heat Network Technical Assurance Scheme (HNTAS): assessment procedures – **bit.ly/CJNov25CPD46**.
[7] BESA Technical Standard For UK HIU Test Regime – **bit.ly/CJNov25CPD47**.
[8] Department for Energy Security and Net Zero, *Heat Network Optimisation Guide* – **bit.ly/CJNov25CPD48**.

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