

Introduction to commercial heat pump systems.

Everything you need from the heat pump unit to the point of outlet.

**SUSTAINABLE
APPROACH**



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Scott Mason - Head of Business Development

The Net Zero agenda presents both challenges and opportunities for our industry. Kooltech's reputation as one of the UK's most experienced specialists in air conditioning, sustainable heating, and climate solutions means the company is well-positioned to grow and play a vital role in the decarbonisation effort. Our sustainability and applied division has been established to help our customers transition to and implement heat pump systems to the highest standards, working collaboratively.

HEAT PUMPS AND CHILLERS INTRODUCTION

HEAT PUMPS AND CHILLERS MANUFACTURED BY MITSUBISHI ELECTRIC, SELECTED SUPPORTED AND SUPPLIED BY KOOLTECH

Mitsubishi Electric are known for its high-quality heating and cooling systems that meet the full requirements of the UK HVAC market. MEHITS is (Mitsubishi Electric Hydronics and IT Cooling Systems S.p.A) Mitsubishi Electric's specialist hydronic air conditioning company. Offering air cooled and water cooled heat pumps, chillers and heat recovery solutions for comfort, process and IT cooling applications.



Systems suitable for a wide range of commercial and industrial applications, including offices, hotels, hospitals, care homes, schools and universities and industrial process and data centres.

Kooltech Support

Kooltech's dedicated Applied division and Business Development Team consist of experienced mechanical engineers specialising in decarbonisation projects and heat pump systems. Beyond supplying Mitsubishi Electric's range of heat pumps, we also provide all necessary components up to the point of outlet, including K-con bespoke solutions; these are manufactured to UKCA, CE, and ISO standards. This offers project owners a single point of contact and ensures seamless project delivery.

Our support covers all stages, from pre-design through to handover. We integrate support for all products within the primary loop, seamlessly applying K-con bespoke solutions alongside third parties. These are designed to optimise the performance of Mitsubishi Electric heating systems: **1.** Design assistance **2.** Product selection **3.** RIBA stage 3 schematics, including primary loop components **4.** Full bill of materials for a cost-certain solution.

Heat Pump	Refrigerant	Max Flow Temp at -5°C	Flow Range	0kW	50	100	200	300	400	500	600	700	800	900	1000+
Ecodan CAHV-R	R454C	70	24 - 70		40										640
Ecodan CAHV-Z	R290	75	24 - 75		40		280								
Ecodan QAHV	R744	90	55 - 90		40										640
Ecodan	R290	75	45 - 75	5-12											
Ecodan	R32	58	25 - 60	5	84										
e-SERIES	R32	55	25 - 55			150									1080
FOCS-N	R513A	55	26 - 60						476		597				
FOCS2-W	R513A	55	26 - 60						476		597				
EW-HT	R134a	78	55 - 78		70		279								
i-FX-N-G05	R513A	60	26 - 60						453						1112
NX2-N-G06	R454B	55	24 - 55					316					800		

Table: Overview, Standard Heat Pump range - supplied by Kooltech.

STANDARD HEAT PUMP RANGE



MITSUBISHI ELECTRIC - HEAT PUMPS FOR HEATING AND HOT WATER

Mitsubishi Electric offers three main lines of heat pumps: **Ecodan**, **e-Series**, and **Climaveneta**. These systems can be set up individually or as part of a larger modular system for large domestic, commercial, and industrial sites.

At Kooltech, we offer a comprehensive, end-to-end heat pump solution, from the outdoor unit to the point of outlet. This approach provides a comprehensive solution with cost certainty, simplifying procurement and logistics and minimising potential issues from the design phase through to installation and commissioning. Every third-party component and K-con bespoke solution is specifically chosen and integrated into the system design to fully optimise the heat pump's performance.

THE CAHV HEAT PUMP (R454C OR R290), stands as a cornerstone of Kooltech's decarbonisation solutions. An industry multi-award-winning product, this heat pump unit delivers exceptional performance and versatility for a range of commercial applications. Various configurations, heating, domestic hot water, or heating and hot water. Facilitates the decarbonisation of existing commercial buildings.

Features:

CAHV-R

- Operates on R454C refrigerant, low-GWP 148 - up to 70°C
- Cascaded units up to **640kW modular**
- MCS Certified and Award winning

CAHV-Z

- Operates on R290 refrigerant, low-GWP 3 - up to 75°C
- High seasonal efficiency with an SCOP > 4
- Low noise mode, reduced SPL by 5dBA
- Cascaded units up to **280kW modular**

DHW up to 70°C



Download the product data sheet



DHW up to 75°C

R290



STANDARD HEAT PUMP RANGE



THE ECODAN R290 has a guaranteed operation range down to -25°C ambient temperature, achieving high water temperatures up to 75°C, and is ultra quiet. A perfect renewable alternative to conventional fossil fuel boilers.

5kW, 6kW, 8.5kW, 10kW, 12kW

Features:

- A+++ Heating Efficiency (at 35°C, range A+++ - D)
- Operates on R290 refrigerant, low-GWP 3
- MELCloud Enabled
- Fully Electric Source for heating and hot water

DHW up to 75°C

R290



Download the product data sheet



THE QAHV HEAT PUMP R477, for domestic hot water only. The QAHV unit ensures highly reliable performance as well as high heating capacity even at low outdoor temperatures.

40kW to 640kW

Features:

- High efficiency at high flow temperatures
- Operates on R744 CO₂ low-GWP 1
- Full heating capacity down to -3°C
- Operates in outdoor temperatures down to -25°C

DHW up to 90°C



Download the product data sheet



THE EAHV E-SERIES R32 modular system allows up to **6 individual units** to be connected. Using this modular approach reduces space requirements and simplifies lifting and installation.

150kW to 1,080kW

Features:

- 4 highly efficient Inverter scroll compressors, per module
- Operates on the future-proof R32 refrigerant low-GWP 675
- Y-shaped heat exchangers allow for a greater surface area, significantly reducing space, maximising efficiency, while keeping the units much narrower than conventional heat pumps for a smaller footprint

DHW up to 55°C



Download the product data sheet



For the full heat pump range, contact: sales@kooltech.co.uk

Products in this brochure operate on fluorinated greenhouse gases.

WHY IS THE UK LOOKING AT AIR SOURCE HEAT PUMPS?

The UK has set a legally binding target to achieve Net Zero greenhouse gas emissions by 2050. Achieving this will require virtually all heat in buildings to be decarbonised, and heat in commercial applications will need to be reduced to close to zero carbon emissions.

Ultimately, the UK's main goal is to achieve the Net Zero 2050 target and strengthen the nation's long-term energy security. There are drivers to help accomplish this and to reduce reliance on burning fossil fuels in the built environment. On 30th January 2025, the UK Government announced a new target to accelerate the decarbonisation of the UK, aiming to cut emissions from 78% to 81% below 1990 levels by 2035.

Emissions in the UK have been steadily decreasing, with estimated levels in 2024 50.4% below those in 1990. The emissions reduction in 2024 was driven by the electricity supply and industry sectors, with the UK's last coal-fired electricity power station, Ratcliffe-on-Soar, closing in October 2024. To lower emissions further between now and 2030 will need to come from sectors other than energy supply.

While the Committee on Climate Change has highlighted the need for a major increase in domestic homes' heat pump adoption, with a target of 600,000 installations per year by 2028, recent data (August 2025) from the Boiler Upgrade Scheme suggests a surge in applications and installations, indicating that the UK may meet that target.

UK to cut emissions from 78% to 81% below 1990 levels by 2035.

UK GREENHOUSE GAS EMISSIONS

Heating homes and businesses accounts for as much as 34% of the UK's planet-warming carbon dioxide emissions.

Over half of the UK's largest businesses have already committed to eliminate their contribution to carbon emissions by 2050, and over 2,000 small-to-medium sized businesses as of November 2021 pledged to reduce their emissions. ¹

The graph shows which sectors produce the most greenhouse gas emissions in the UK.



Above: from the Department for Business, Energy and industrial strategy 2021, over 100% due to rounding.

THE ROLE OF HEAT PUMPS

Heat pumps, like Mitsubishi Electric's Ecodan systems, offer a low-carbon alternative to gas, LPG, and oil heating. These systems extract energy from the air and efficiently provide heat for space heating and hot water. By adjusting output to match demand, heat pumps minimise energy waste and enhance overall efficiency. In commercial use, heat pumps can significantly lower carbon emissions, with potential CO2 savings of up to 70% compared to conventional electric heating and up to 65% compared to an A-rated gas boiler. ²

SOURCE 1: <https://www.gov.uk/government/news/third-of-uks-biggest-companies-commit-to-Net-Zero#:~:text=The%20government%20has%20put%20in,to%20make%20ambitious%20climate%20targets.>

SOURCE 2: <https://es.mitsubishielectric.co.uk/the-hub/renewable-heating-is-the-future-for-commercial-buildings>

WHY COMMERCIAL ARE THE BIG WINS IN DECARBONISATION

COMMERCIAL VS. DOMESTIC GAS USAGE

Non-domestic gas use is comparable to the amount consumed by 13.5 million homes, despite there being only 1.75 million non-domestic buildings compared to 18.7 million homes with a gas supply in England and Wales. **This shows that a large share of gas consumption is concentrated in fewer buildings, making them more practical targets for decarbonisation.**

The Non-Domestic National Energy Efficiency Data Framework, which collects data for England and Wales, indicates that in 2012, the non-domestic sector consumed 160 terawatt-hours (TWh) of gas. Compared to the 156 TWh reported in the latest data set in 2022, this reflects only about a 2.5% reduction over ten years, which falls considerably short of the levels necessary to meet the UK's legal commitments and carbon budgets.

The government, through the Public Sector Decarbonisation Fund, has allocated over £3.6 billion since 2020 to help public sector organisations, such as schools and hospitals, replace gas heating with low-carbon alternatives.

Commercial Heat Pump Sales

Annually, roughly 35,000 heat-generating products are sold for commercial buildings, presenting a substantial growth opportunity for the heat pump market.

SOURCE: <https://es.mitsubishielectric.co.uk/the-hub/commercial-heating-an-overlooked-source-of-carbon-savings>



1.75 million non-domestic buildings

in England and Wales.



REGULATIONS DRIVING NET ZERO

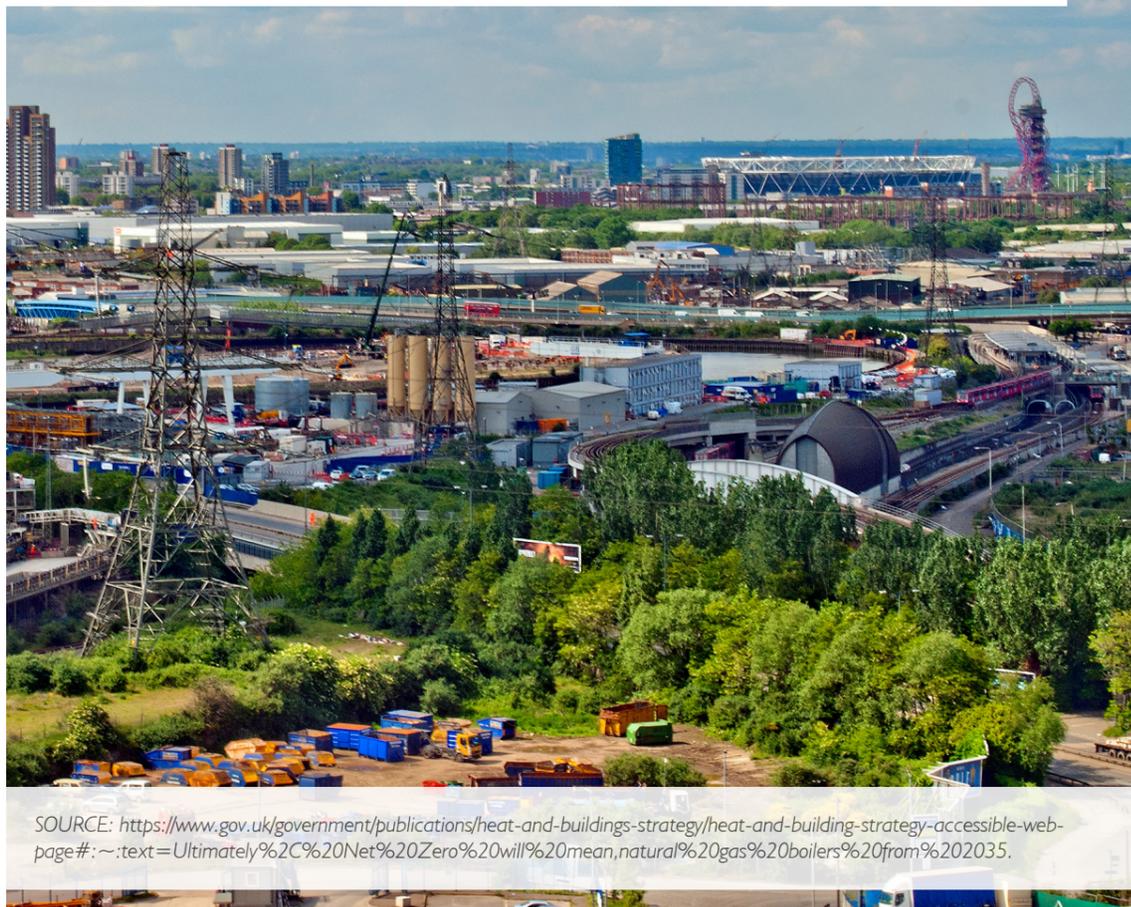


The UK government's ambition is to phase out the installation of gas boilers, so that by 2050, almost all heating systems will be low-carbon, as stated in the Heat and Buildings Strategy.

Heat pumps will play a major role in decarbonisation and reducing the UK's emissions, as they are a well-established, proven, scalable, low-carbon technology that delivers effective heating and offers immediate and substantial carbon emission savings compared to fossil fuel heating systems.

The Labour government also plans to build 1.5 million homes in England over the next five years. Many of these new-build residential properties are likely to be fitted with a heat pump as the Future Homes Standard comes into effect later this year, mandating that all new homes in England must be built with low-carbon heating technology by 2028 (originally scheduled for 2025).

And there is a drive for commercial buildings with the Future Buildings Standard, to drive forward the transition to cleaner heating for the built environment.



SOURCE: <https://www.gov.uk/government/publications/heat-and-buildings-strategy/heat-and-building-strategy-accessible-web-page#:~:text=Ultimately%2C%20Net%20Zero%20will%20mean,natural%20gas%20boilers%20from%202035>.

THE EFFICIENCY OF BUILDINGS

MINIMUM ENERGY EFFICIENCY STANDARDS [MEES]

The MEES Regulations are part of the Energy Efficiency (Private Rented Property) England and Wales Regulations 2015. This is an element of the Government's carbon reduction commitment and target to cut CO₂ emissions by at least 40% by 2030.

Since April 2018, landlords of non-domestic rented properties have only been allowed to grant a new tenancy, or to extend or renew an existing one, if their property has at least an Energy Performance Certificate (EPC) rating of E, unless they have registered a valid exemption. In 2023, the EPC E rating extended to cover all privately rented non-domestic properties (even where there has been no change in tenancy).

By 2028, all new tenancies must meet an EPC C.

2030 is not that far away, and there are incentives available for low-carbon technology such as heat pumps, which will help to improve the efficiency of many of these properties.

If the property is empty and is not being let, no action is required; it's only when you go to let it out.

ENERGY PERFORMANCE CERTIFICATES [EPC]

The UK Government aims to introduce updates to EPC metrics in the second half of 2026. EPCs originally provided information on the expected running costs of a home. Overtime time they've developed to introduce energy improvements; the new metrics will expand on this part. Each property is given a score, the higher the number the more energy-efficient the property, and this is calculated using a Standard Assessment Procedure (SAP).

1. Fabric performance
2. Heating system
3. Smart readiness
4. Energy cost

The latest figures show that almost half (46%) of the homes in England are now EPC rated C or above for energy efficiency, compared to 14% in 2010.

(source: New homes to produce nearly a third less carbon - GOV.UK)



BUILDING REGULATIONS AND HEAT PUMPS.

By building and renovating in accordance with the building regulations outlined in Parts L, F, and O, the UK is creating a more sustainable future. Part L's focus on energy efficiency will help to reduce our carbon footprint, while Part F ensures that the push for airtight, low-energy buildings does not come at the expense of our health by mandating proper ventilation. And Part O addresses the critical, increasingly urgent challenge of overheating as our climate changes. Together, these regulations form a comprehensive strategy that not only helps the UK meet its ambitious Net Zero 2050 target but also delivers healthier, more comfortable, and resilient homes and buildings for everyone.

PART L 2021 REGULATIONS: CONSERVATION OF FUEL AND POWER.

Two sections: Dwellings and Non-domestic dwellings. **The aim of Part L is to lower carbon emissions and boost energy efficiency.** Part L sets a minimum standard for overall energy performance and is a key step towards the Future Homes Standard and the Future Building Standard, aiming for a significant reduction in carbon emissions compared to earlier standards. (31% domestic and 27% non-domestic).

Measured against three key metrics of primary energy rate, emission rate and fabric energy efficiency.

Domestic: Standard Assessment Procedure (SAP) 10.2 changes to methodology*
Electricity kWh emissions now 0.233 (reduced from 10.1 which used to be 0.398)

Non-domestic: Simplified Building Energy Model (SBEM) calculations at preconstruction and post construction stages, ensuring energy and emissions targets are met.
To pass Part L, the BER (Building Emission Rate) must be equal to or lower than the TER (Target Emission Rate). **BER ≤ TER**

One of the most significant changes to the 2021 Part L update was how heating systems must be designed and implemented in new build properties with a **maximum flow temperature of 55°C**. An idea flow temperature for heat pumps and a substantial reduction from traditional systems that typically operated at around 80°C.

*New standards are expected to be updated and SAP will be replaced with the Home Energy Modelling [HEM] in 2026.

SOURCE Part L: Dwellings: https://assets.publishing.service.gov.uk/media/662a2e3e55e1582b6ca7e592/Approved_Document_L__Conservation_of_fuel_and_power__Volume_1_Dwellings__2021_edition_incorporating_2023_amendments.pdf

SOURCE Part L: Non-dwellings: https://assets.publishing.service.gov.uk/media/63d8edbd90e0773d8af2c98/Approved_Document_L__Conservation_of_fuel_and_power__Volume_2_Buildings_other_than_dwellings__2021_edition_incorporating_2023_amendments.pdf



PART F 2021 VENTILATION

The main aim of the requirements of Part F "is that a ventilation system is provided, that under normal conditions is capable of limiting the accumulation of moisture, which could lead to mould growth, and pollutants originating within a building that would otherwise become a hazard to the health of the people in the building"

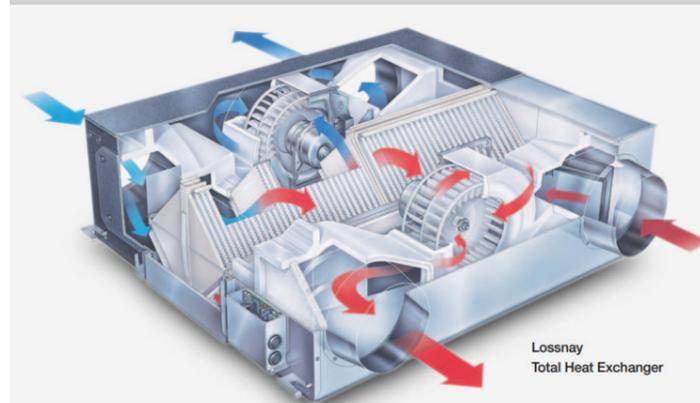
Ventilation is the removal of stale air from a building replaced with fresh air from outside. Part F, will improve indoor air quality, which is known to be up to 5 times worse for our health than outside air.

The need for good ventilation can be balanced against the need to lower energy use in buildings.

New guidance recommends that mechanically ventilated common spaces in offices have a minimum air supply rate of 0.5 l/s.m2. New requirement for the installation of CO₂ monitors (levels consistently higher than 1500ppm in an occupied room indicate poor ventilation).

SOURCE Part F: Dwellings: <https://assets.publishing.service.gov.uk/media/61deba42d3bf7f054fcc243d/ADF1.pdf>

SOURCE Part F: Non-dwellings: https://assets.publishing.service.gov.uk/media/62a761edd3bf7f03667c667e/ADF2_revised.pdf



It can be assumed that there will be a continual trend towards more airtight buildings due to drivers for higher energy efficiency and lower carbon emissions.



PART O 2021 OVERHEATING

Part O examines the risks of overheating in new-build properties, including flats, care homes, children's homes, and student accommodation. The Climate Change Committee (CCC) estimates that by 2050, we could face more than 10,000 heat-related deaths each year, caused by rising temperatures, particularly in newly built properties.

The UK experienced record-breaking temperatures exceeding 40°C for the first time in July 2022. The Met Office warns that these heatwave temperatures could become typical summer levels by 2035, even if countries adhere to their climate commitments as outlined in the 2015 Paris Agreement.

SOURCE Part O: <https://assets.publishing.service.gov.uk/media/6218c5aad3bf7f4f0b29b624/ADO.pdf>

SOURCE CCC Progress in adapting to climate change 2025 report: <https://www.theccc.org.uk/publication/progress-in-adapting-to-climate-change-2025/>

Calculations to minimise solar gain and remove excess heat ensure that properties are suitable for the predicted temperature rises. Part O will look to reduce mechanical cooling and prioritise passive measures, such as shading, natural and mechanical ventilation and thermal mass. Part O calculations aim to minimise overheating in new residential properties, and guidance is available from CIBSE, TM59.

Building and renovating to Part L, F and O will help to deliver low-carbon buildings producing less carbon emissions and help the UK to meet its Net Zero 2050 target.

(source: New homes to produce nearly a third less carbon - GOV.UK)



By building and renovating in line with the regulations outlined in Parts L, F, and O, the UK is implementing a comprehensive and integrated strategy to create a more sustainable future. There is also a move to include "Part Z" in the UK's Building Regulations, which would establish standards for embodied carbon in construction.

REFRIGERANTS AND EMBODIED CARBON

Due to the F-Gas phase-down, manufacturers use typical refrigerants to operate many domestic and commercial air source heat pump systems. Commonly, these are R32 and R290. For commercial applications, R744 (carbon dioxide, also known as CO₂) is becoming a popular choice, as well as R454C, a blend of R32 and R1234yf.

The type of refrigerant used in air conditioning and heat pump units can significantly impact embodied carbon. Even if units are manufactured in the same location and shipped in the same manner, we must consider the refrigerant volume and its global warming potential (GWP).

Type	GWP	Flammability Category
R290	3	A3
R32	675	A2L
R454C	148	A2L

Embodied carbon is starting to become more important in the HVAC sector.

Embodied carbon refers to the greenhouse gas emissions associated with a building's entire lifecycle, including material extraction, manufacturing, transportation, and construction. Operational Carbon is generated during a building's use.

Regulations and Plans: Major cities like London and Manchester already require new buildings to consider embodied carbon. There is also a movement to add "Part Z" to the UK's Building Regulations, which would establish standards for embodied carbon in construction, and CIBSE has produced guides such as TM65: Embodied Carbon in Building Services.

Growing Awareness: People are realising that every building material has a carbon footprint and that we need to consider the impact on the planet.

Making Smart Choices: Understanding the embodied carbon of different building products enables specifiers to select products and materials that support a better environmental design.

The Chartered Institution of Building Services Engineers (CIBSE) created a guide called TM65.4 2025. This provides a formula to calculate the embodied carbon of building services equipment and helps to compare different products more easily. Residential Heating provides a formula to calculate the embodied carbon of building services equipment and assists in comparing different products more easily. A TM65 calculation can be carried out for each component, producing an individual embodied carbon figure in kgCO₂e. These figures can be added together to generate an embodied carbon value in kgCO₂e for the entire system. Although the additional refrigerant charge of the outdoor unit is not included in its TM65 calculation, it is important to account for the working refrigerant charge when considering the embodied carbon of a complete HVAC system.

As a leading manufacturer of HVAC equipment, Mitsubishi Electric has already been producing embodied carbon guides for its products to help the building services sector assess the impact of using or specifying its equipment.

At Kooltech, we enhance Mitsubishi Electric units through system design and associated components.

CIBSE TM65.4 2025 Embodied carbon in building services: office HVAC



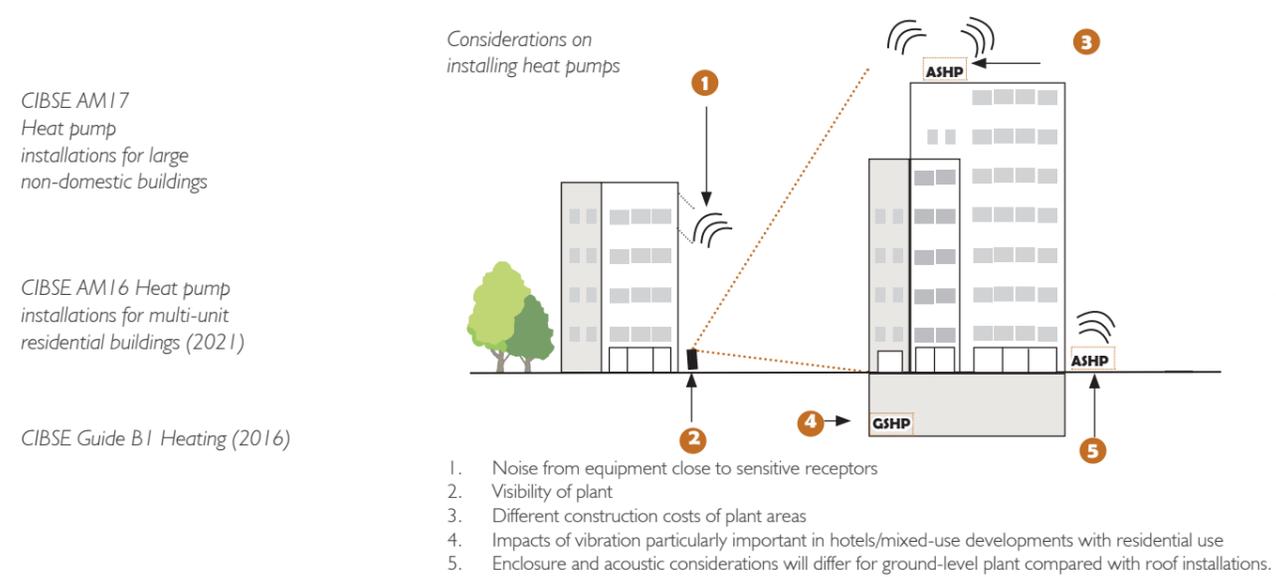
SOURCE: https://www.london.gov.uk/sites/default/files/lpg_-_wlc_a_guidance.pdf

CONSIDERATION FOR DESIGNING A HEAT PUMP SYSTEM

Our team follows established methodologies and collaborates with you and your Kooltech project manager at every stage. When designing a heating heat pump system, several key factors must be considered, including outside air temperature, system sizing, supplementary heating, sound levels, site positioning, footprint and height, future building layouts, refrigerants, service and maintenance, and ultimately, comfort (including the connection of indoor heat emitters). All are essential for ensuring the system's efficiency, effectiveness, and overall performance.

Designing the heat pump system based on the expected lowest outdoor temperature ensures that the system is appropriately sized to provide adequate heating even in colder weather, while maximising energy efficiency. This prevents the heat pump from working excessively hard and inefficiently when outdoor temperatures are at their lowest. For commercial properties, CIBSE AM17 is referenced, and for domestic properties, MCS regional weather data is used.

Kooltech obtained the Microgeneration Certification Scheme for the Design of Heat Pump Installations to MIS3005/D in May 2025, offering further support for our customers. This certification demonstrates our commitment to meeting the highest standards.

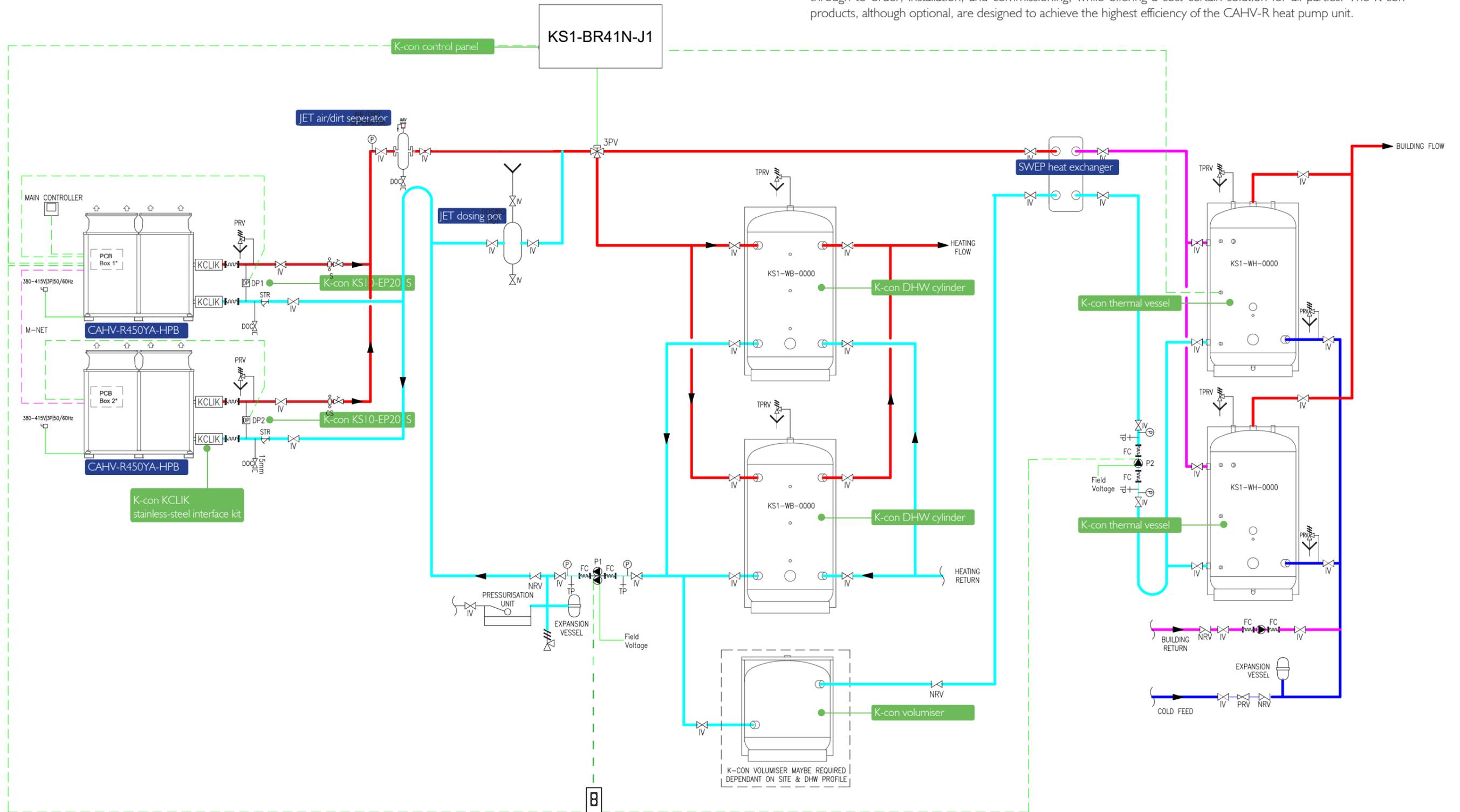


ENGINEERING SERVICES AND TECHNICAL SUPPORT

EXAMPLE SCHEMATIC: CAHV HEAT PUMP, HEATING AND HOT WATER SYSTEM.

Note: this schematic is for illustration purposes only.

A heat pump design including all components up to the point of outlet from Kooltech. The complete system simplifies and accelerates the procurement and logistics of the heat pump solution, reducing potential pain points from design through to order, installation, and commissioning, while offering a cost certain solution for all parties. The K-con products, although optional, are designed to achieve the highest efficiency of the CAHV-R heat pump unit.



2x 40kW Mitsubishi Electric CAHV heat pump units, 4x K-con KCLik, 2x K-con thermal vessels, 1x K-con volumiser, 2x K-con DHW cylinders and 1x K-con control panel BR41N.

Combining Mitsubishi Electric heat pump technology with K-con solutions and third-party components within the primary loop.

THE K-CON RANGE: INNOVATIVE SOLUTIONS FOR YOUR PROJECTS

At Kooltech, we know that every project has unique requirements. That's why we developed the K-con range of bespoke solutions. Whether you need modifications to a Mitsubishi Electric HVAC system or tailor-made accessories to enhance your setup, K-con has you covered.

Kooltech are uniquely positioned to offer this.

INNOVATION

Our team of project sales specialists, application engineers, and our dedicated K-con factory thrive on a challenge. We see every unique project as an opportunity to innovate and add real value to a building's mechanical systems. We work closely with you to understand your specific needs and have a proven track record of overcoming strict project barriers.

For example, our K-con solutions have helped projects meet demanding requirements such as EN378 and BREEAM. We can also provide weatherproof housing for equipment when indoor space is limited, or design systems with future building extensions in mind.

OUR PRODUCTS

We continually research and develop new solutions. Our K-con solutions are an ever-growing range that we offer to the market, constantly evolving from listening to our customers, finding out their requirements and project challenges.

Many of our K-con products are unique and include but are not limited to a modified Mitsubishi Electric Branch Controller box with port isolation that allows engineers to service individual indoor units without shutting down the entire VRF system. These K-con modifications are approved by Mitsubishi Electric and are backed by warranty.

Our engineers and the K-con bespoke products work in conjunction with the Mitsubishi Electric HVAC range to maximise installation efficiency and reduce on-site time.

NEW K-CON PRODUCT K-CLIK

Kooltech Applied and K-con teams are dedicated to simplifying on-site work and preventing costly delays. With that goal in mind, we've developed a new stainless-steel linkage interface kit to ensure a secure and hassle-free connection between the CAHV-R heat pump and the water system.

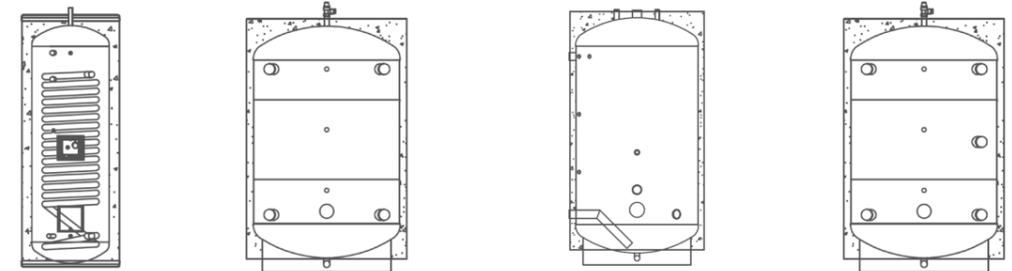
Small details can lead to big delays on-site. That's why the Kooltech Applied and K-con teams are always finding ways to make life easier for engineers.

This new 48mm stainless-steel Victaulic coupling matches the connection of the Mitsubishi Electric CAHV-R heat pump, limiting the use of mixed metals within the heating system.

Having these in stock avoids long-lead times and offers flexibility of installation with threaded, compression and press fit connections.



VESSELS FOR HEAT PUMPS



K-con has developed this range of hot water storage to provide a robust solution for diverse heating, cooling, and hot water scenarios. Manufactured in stainless-steel due to the material's highly resistance to corrosion and rust, making it ideal for environments where water quality might be a concern. Using a stainless-steel hot water cylinder over a regular steel water cylinder offers many advantages, especially in areas with soft water, where the water lacks mineral content. Regular steel cylinders are more prone to corrosion due to the absence of protective minerals.

Stainless steel does not alter the chemical composition of water.

Crucial for maintaining water purity and essential for meeting standards required for warranty of heat pump technology. Regular steel cylinders may corrode over time, potentially introducing metallic contaminants into the water supply. Stainless steel cylinders, preserve the integrity of the water, ensuring it remains safe and free from any unwanted chemical changes.

Product concept

All K-con vessels are crafted from Duplex stainless-steel, resulting in a 5-year warranty. The material means there is no magnesium anode, making for a maintenance-free application.

3rd party approvals

Domestic product approvals: BBA, UKCA, CE, WRAS, KIWA, ISO, WRC
All K-con vessels use the same compliant materials.

Product solutions

Each of our vessel ranges can be tailored to accommodate the individual project requirement. We take pride in offering a bespoke modification service that ensures our products align seamlessly with your unique specifications. Whether it's adjustments to size, configuration, or additional features, our dedicated team is committed to crafting a solution that precisely meets your project needs.

Our team of Kooltech and K-con engineers are here to assist.

K-con vessel as seen in the Fareham, Hampshire Demonstration Suite >
Pictured: Jack Kerr and Sonny Rumsby - Kooltech Applied Engineers.



CONTROL FOR CAHV-R HEAT PUMPS



Introducing the new, streamlined method for operating the Mitsubishi Electric CAHV-R in heating and hot water mode. The KSI-BR41N is a self-contained control solution that eliminates the need for a complex and expensive Building Management System (BMS) to manage the transition between heating and domestic hot water demands; ideal for small scale retrofits, such as care homes, schools and boutique hotels.

This innovative control panel only requires wiring between the CAHV-R unit, a motorised valve, and a remote temperature sensor in the hot water cylinder, making the KSI-BR41N panel ideal for smaller sites, offering significant cost savings compared to traditional BMS setups.

To see it in action, we invite you to visit our demonstration suite in Fareham, Hampshire. Contact your Kooltech sales representative, local branch or fill in the online form: <https://bit.ly/OnlineDemoForm>



HEAT EXCHANGERS

Kooltech is a dedicated supplier of SWEP Brazed Plate Heat Exchangers (BPHEs), specialising in delivering high-quality solutions for various projects. Our team is trained to use the SWEP software package to design and select the most suitable product for your specific requirements. Our standard range of products utilises SWEP's BPHE technology. The BPHE is made from a plate assembly of corrugated channel plates with a filler material between each plate. During a vacuum brazing process, the filler material creates a strong brazed joint at every contact point, forming complex internal channels.

This design allows two media at different temperatures to come into proximity, separated only by the channel plates. This setup enables highly efficient heat transfer from one medium to the other. The concept is like other plate and frame technologies, but offers a more compact, robust design without the need for gaskets and frame parts.

BPHEs serve a dual purpose: they significantly improve energy efficiency while also providing effective heat transfer for applications such as domestic hot water.

Certifications and Approvals

Most SWEP products are approved by leading certification organisations, including:

- Europe: Pressure Equipment Directive (PED)
- America: Underwriters Laboratories Inc (UL)
- Japan: Kouatsu-Gas Hoan Kyoukai (KHK)

SWEP also holds approvals from numerous other certification organisations, ensuring our products meet global standards for quality and safety.

SOLUTIONS



KSI-HEX HEAT EXCHANGER

Developed to meet the market's highest thermal demands for DHW production. The unique construction, with integrated start and end plates, combined with high compactness and efficiency means this plate offers a very versatile solution. This range is pre-selected to deliver adequate heat transfer of multiple CAHV air source heat pump units, considering normal use and de-frost conditions.



BESPOKE

Our K-con team of experts are ready to assist you in tailoring your plate heat exchanger selection to meet your projects unique needs. Leveraging the cutting-edge SWEP software package, we have the in-house capability to swiftly and efficiently design, select, and price the entire product, meeting your needs with precision and excellence.



JET RANGE. CONFIDENCE IN EVERY COMPONENT.

Kooltech has curated a selection of JET Range components designed to fully optimise Mitsubishi Electric Heat Pump systems. These comprehensive solutions offer value, compliant performance, and simplified procurement, all from one trusted supplier.

JET Range products are engineered for reliability and built to specification. From valves to fittings, every component is rigorously tested and supported by top industry accreditations, including BS, EN, ISO, PED, CE, and WRAS. JET is built for quality and dependability.

The complete heat pump system, including the JET component range, can be viewed at the Kooltech 'Demonstration Suite' in Fareham, Hampshire.

If you would like to arrange a visit: email southernprojects@kooltech.co.uk, northernprojects@kooltech.co.uk or scotlandprojects@kooltech.co.uk

A cost-certain, fully comprehensive solution from Kooltech



THE KOOLTECH APPLIED DEMO SUITE IN FAREHAM, HAMPSHIRE.

The suite includes a fully operational commercial heat pump unit connected to all components up to the point of outlet, including Jet range components, K-con thermal store, and potable hot water vessels, along with all associated valves, thermostats, and custom controls. Kooltech Applied's comprehensive system simplifies and speeds up the procurement and logistics of the heat pump solution, reducing potential issues from design through to order, installation, and commissioning, while offering a cost-certain and straightforward solution.

“ I encourage anyone interested in decarbonisation heat pump projects to visit. Contractors wanting to take their first steps into commercial heat pumps and potable hot water can become familiar with the complete solution. It's ideal for pre-commissioning checks and general hands-on training, as the system setup allows them to test, check, touch, and ask questions before on-site installation.

We also encourage end-users who are considering decarbonisation projects, as it may help them identify potential sites more easily. We will provide a CPD guide and Q&A for those who wish to have it. ”

- Scott Mason, Head of Business Development

LEARNING OBJECTIVES

- Identify potential heat pump projects for decarbonisation.
- See an entire system operate, hear and feel it in a safe environment.
- Learn about the system, have a CPD.
- Need to test, best here than onsite.

Arrange a demonstration visit, email: southernprojects@kooltech.co.uk, northernprojects@kooltech.co.uk, scotlandprojects@kooltech.co.uk



PROJECT STUDY

RETROFITTING STUDENT ACCOMMODATION

With Mitsubishi Electric PUZ-WZ80VAA(BS) Heat Pumps.

Enhancing energy efficiency and comfort in a student accommodation block by selecting four Mitsubishi Electric Ecodan heat pumps. The heat pumps, along with K-con stainless steel hot water calorifiers, delivered hot water efficiently and reliably, ensuring occupants' safety, reducing running costs, and improving overall comfort for the students.

- Ultra quiet noise levels
- Flow temperatures up to 70°C
- Low cost compared to commercial alternative
- R290 refrigerant GWP 0

1 STAGE SYSTEMS

Hot water production up to 70°C.

RELIABILITY

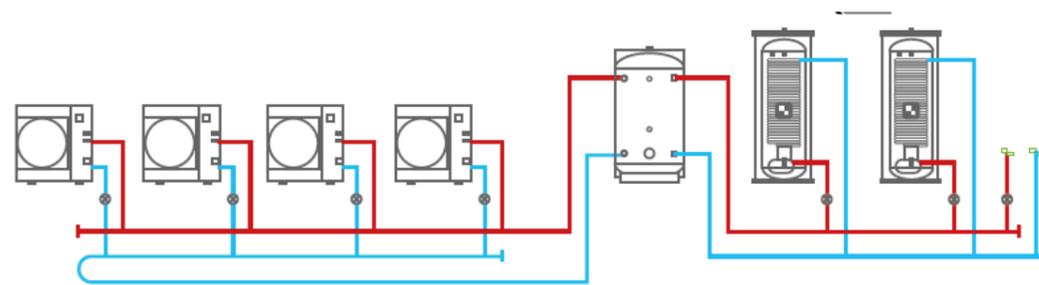
Four points of failure for reliable operation, cascaded to work together to perform.

OUTPUT

These units can also be cascade to deliver anything from 8 to 48kW.

SPACE SAVINGS

Reduced clearances for easy installation, even in sites with space constraints.



Mitsubishi Electric Ecodan heat pumps in cascaded set-up. Full system selection, design and supply by Kooltech.

K-con KSI-WHP-74 Cylinders.

Providing comprehensive support

Kooltech supplied all components within the primary loop, incorporating K-con bespoke solutions and third-party products through our procurement channels to ensure efficient and effective solutions. These solutions are specifically designed to support the application of Mitsubishi Electric Heat Pump technology. Our Kooltech engineers collaborated with the customer on the design to ensure all project specifications were met.

Our support covers all stages of the project, from pre-design to construction, commissioning, and handover.



PROJECT STUDY

DECARBONISING A GOTHIC REVIVAL RIVERSIDE SCHOOL, IN LONDON.

With Mitsubishi Electric CAHV-R Heat Pumps.

Serving heating and hot water for a Grade II listed Victorian Gothic Revival school building, which has been refurbished and extended. The designated plantroom was too small to accommodate the originally specified four vessels, and there were stringent noise issues as the school was in a densely built-up residential area.

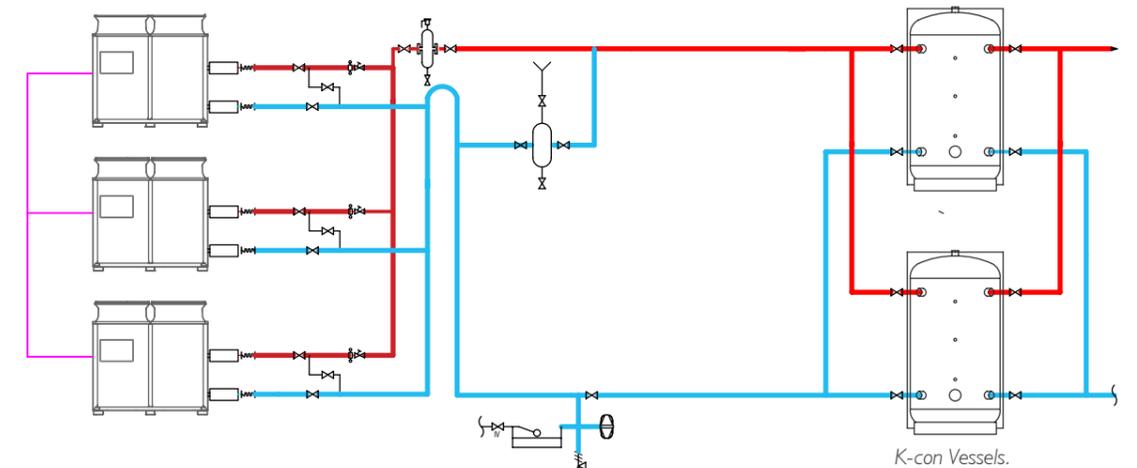
To recognise space limitations and maximise the efficiency of the heat pump units, two thermal storage vessels were chosen from the K-con bespoke product range. Custom-made stainless steel-clad vessels are installed externally, freeing up valuable space in the plant room, and accommodating two domestic hot water vessels connected to the CAHV domestic hot water heat pump units.

To address noise concerns, the CAHV heat pump units feature a built-in noise reduction input designed for extreme cases, making these products very suitable for this application. Adding top and side acoustic enclosures further reduced the decibel levels by 8dBA, effectively minimising noise disturbance to the surrounding residential community.



With the support of our engineering and K-con R&D team and our exclusive partnership with Mitsubishi Electric we were able to apply our expertise in the complete system design and integrating components to help deliver the projects tight requirements and create a lasting positive impact with the school and working with HOB Mechanical Services.

Jonathan Brown - Commercial Director at Kooltech



Above: Mitsubishi Electric 3*CAHV-R heat pumps connected to two thermal vessels - heating only. One of three heat pump systems for this project.

Providing full support

The heating and hot water system was installed in a confined space. It achieved the necessary noise reduction levels, providing a dependable and efficient solution for the school's space heating and hot water needs, ensuring a successful and environmentally conscious installation. This project demonstrates the importance of collaboration between contractors and suppliers in delivering effective and sustainable heating solutions.

ABOUT KOOLTECH

At Kooltech, we specify, modify, engineer, design, support, and supply heating, ventilation, air conditioning, and refrigeration (HVAC+R) equipment, components, refrigerant gases, and tools. Built around our customers, we challenge the status quo in the HVAC+R industry by thinking outside the box. We can do this because we have in-house expertise and facilities, including our K-con R&D division and factory, as well as our Kooltech Applied department, which specialises in decarbonisation and sustainability heat pump projects.

Beyond distribution

We have a longstanding partnership with Mitsubishi Electric that spans over thirty years, giving us unmatched access to industry-leading HVAC products. As the UK's only exclusive Mitsubishi Electric distributor, we offer exceptional technical expertise across the entire product range. This includes our Mitsubishi Electric Manufacture-approved modifications, delivered through our K-con bespoke solutions, ensuring seamless integration and optimised system efficiency. All are designed and manufactured to meet strict CE and UKCA certification standards, as well as ISO standards, guaranteeing quality and compliance.

CPD AND WHITE PAPERS

Explore our various presentations, papers and guides, deepening your knowledge on the role of heat pumps and the UK's path to Net Zero.

Our CPD-accredited Whitepaper Guide to Net Zero. Or our papers on heat pumps for Local Authorities. We are continually building on topics relevant to you. If there is a topic related to heat pumps that you would like more information on, please get in touch with us, as we can prepare a bespoke presentation.

As an exclusive distributor for Mitsubishi Electric, we are also able to present their complete range of CPDs. If you would like to arrange a CPD certified presentation arranged at your offices or online.

To arrange a CPD contact your account manager or email:

- southernprojects@kooltech.co.uk
- northernprojects@kooltech.co.uk
- scotlandprojects@kooltech.co.uk

Our Environmental, Social, and Governance [ESG] objectives are comprehensive.

As a carbon-neutral company, we not only focus on reducing our environmental footprint, we also measure SCOPE 1, SCOPE 2, and SCOPE 3 to find ways to strengthen our commitment. We ensure a safe and supportive environment for our employees, customers, and communities, backed by our ISO 45001 certification. We uphold strong ethical standards and we uphold our company's core values.



www.kooltech.co.uk/company-policies

kooltech



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