HEAT PUMP SYSTEMS

DECARBONISING HOSPITALS & HEALTHCARE FACILITIES

2026 Guide for Estate Managers, Energy Managers and Mechanical Services Engineers.

Lochinvar®

DECARBONISING HOSPITALS & HEATHCARE FACILITIES

Almost all UK businesses, organisations and governments are acutely aware of the need to decarbonise and provide sustainable ways of continuing to operate. The government has outlined its decarbonisation strategy which aims to achieve net zero by 2050 across all sectors of the economy.

Businesses and organisations appreciate the impact that fossil fuels have on the environment and it's up to innovative companies like Lochinvar to provide sustainable alternative solutions to help keep momentum in this decarbonisation effort. Lochinvar have been providing commercial heating and hot water solutions for decades, our solutions have evolved to include electric solutions which features full-electric, water source and air source heat pumps among our solar hybrid systems.

Hospitals have a high incentive to accelerate decarbonisation efforts, particularly the NHS estate as they have more aggressive targets to reduce scope 1 and 2 emissions by 2032. Hospitals and healthcare facilities encompass a wide range of building types and applications from specialist hospitals and laboratories to care homes and laundry buildings. Systems need to demonstrate an ability to maintain high temperatures to mitigate legionella risks, which is typically more challenging with heat pump systems.

The purpose of this guide is to help guide you through some newer approaches and their typical applications to help inform you around the latest proven strategies for decarbonising the estate.

MANAGING LEGIONELLA RISK

Legionella control is one of the primary concerns for estates and engineering teams in hospitals and healthcare facilities. HTM 04-01 sets clear expectations for the safe management of hot water systems in clinical environments, with a strong emphasis on maintaining consistently high stored and distribution temperatures, system reliability, and effective control strategies.

It is often assumed that only CO_2 heat pumps can satisfy these requirements due to their higher achievable outlet temperatures. However, Lochinvar's latest generation of R290 (propane) air-source heat pumps have been specifically engineered to deliver temperatures up to 75°C, enabling full compliance with hot water temperature requirements for legionella risk mitigation, without the complexity and high capital cost typically associated with CO_2 systems.

HIGH TEMPERATURE PERFORMANCE FOR LEGIONELLA PREVENTION

Lochinvar's Amicus Altus R290 heat pumps consistently achieve flow temperatures up to 75°C, which are more than sufficient to:

- Pasteurise hot water storage when required
- Maintain safe distribution temperatures
- Support thermal disinfection cycles with its own dedicated legionella program
- Ensure safe delivery temperatures downstream, even in large, complex estates

This performance eliminates the widely held misconception that R290 is limited to lower-temperature applications. In healthcare environments where high temperature stability is critical, R290 proves not only suitable, but highly efficient.

ADVANCED CONTROL WITH IMPERIUM™ ENSURES COMPLIANCE

Our Imperium™ system controller plays a crucial role in maintaining safe conditions against legionella proliferation. Working in conjunction with the heat pump and storage system, Imperium enables:

- Accurate temperature control across the entire system
- Automated scheduling of high-temperature cycles when needed
- Real-time monitoring and data visibility to ensure safe operation
- Stable tank stratification, ensuring full-volume high-temperature storage
- Reduced risk of temperature drop-off in peak or recovery periods

This level of control gives estates teams confidence that required water hygiene temperatures are consistently achieved and maintained across the system.

A SIMPLER, SAFER SYSTEM DESIGN

One of the advantages of Lochinvar's approach is the simplicity of installation and system hydraulics. Unlike CO_2 heat pumps, which often require:

- Additional pumps
- More vessels
- Complex pipework layouts
- High pressure components
- More advanced electrical or system upgrades

Lochinvar's R290 solution enables safer, more straightforward integration into existing healthcare infrastructure. Fewer system components mean:

- Reduced points of failure
- Easier maintenance
- Lower installation cost
- Improved long term reliability

This simpler configuration aligns well with **HTM04** expectations around system resilience, maintainability, and operational continuity.

PROVEN IN HEALTHCARE ENVIRONMENTS

Lochinvar have successfully delivered R290 heat pump systems across multiple healthcare and care home facilities, demonstrating that high temperature R290 technology is both safe and dependable for hot water generation in settings where legionella risk management is paramount.

These installations have shown:

- Stable delivery of high-grade hot water
- Consistent temperatures throughout storage and distribution
- Safe, hygienic operation without reliance on fossil fuels
- Reduced system complexity compared to CO_2 equivalents

STATE OF PROGRESS

In order to decarbonise, organisations, businesses and governments need to invest in new plant and systems. There may also be a need to upgrade other parts of the building whether it be plumbing or electrical improvements. A large amount of funding was made available for these projects, one of the biggest providers is Salix, who deliver government funding schemes across the UK.

The challenge now for estate managers and engineers supporting new decarbonisation projects across hospital estates is that securing funding is becoming increasingly difficult. Many Salix funding windows are closed to new applications which limits the amount of funding available, as a result, there's more competition for this funding. This isn't to say funding has stopped but there are signs of limited future funding, and the current schemes available being highly competitive.

It's important to state that some closed grants may re-open in the future although this isn't guaranteed. Private finance is also an option for decarbonisation projects but it depends on a number of factors.

SOLUTIONS FOR HOSPITAL ESTATES

To identify the best solution for your estate, we first need to understand how you want to balance decarbonisation with capital costs and ongoing operational costs. Current electricity prices are higher than we have seen in recent years, which affects the running costs of low-carbon technologies. In addition, the capital expenditure associated with decarbonised systems is typically higher than traditional plant, which can create barriers to implementation.

If the priority is to decarbonise as much as possible, there are solutions that can fully meet the heating and hot water demands of your application. Alternatively, if a balance between carbon reduction and affordability is required, hybrid approaches can be considered, where the majority of demand is met by low-carbon systems and a portion is supported by efficient traditional plant to reduce overall expenditure.

To recommend the most appropriate approach, we need clarity on the scale of your decarbonisation objectives, including the number of sites, the desired timeframe, the level of carbon reduction you aim to achieve, and the available budget.

Building Type	DHW Usage	Heating Demand
Hospitals	Very high	High
Community Hospitals	Medium	Medium
GP / Health Centres	Low-Medium	Medium
Care Homes	High	High
Labs	Low-Medium	Medium
Mental Health Units	Medium	Medium
Rehab & Therapy Centres	Medium-High	Medium
Outpatient Centres	Low-Medium	Medium
Support Buildings	Low	Low-Medium
Laundry Facilities	Very high	Low-Medium

DECARBONISATION AT BUPA

RICHMOND VILLAGES

Richmond Villages Willaston, part of the BUPA Group, undertook a significant renovation project focused on improving the energy performance and sustainability of its heating system. Hawley Building Services selected Lochinvar's cascadable Amicus Altus R290 Heat Pump system for its proven track record in providing reliable and sustainable water heating solutions. The latest generation of Lochinvar's Air Source Heat Pump (ASHP) systems offers industry-leading efficiency and performance. The Amicus Altus R290 is designed to handle large-scale applications like care homes, where consistent and efficient domestic hot water supply is vital.

WYKEBECK COURT

The primary objective of the project was to support BUPA and Hawley Building Services in replacing the existing water heating system with a sustainable and energy-efficient solution. The new system needed to meet the care home's domestic hot water demands reliably while contributing to BUPA's broader decarbonisation strategy. Hawley Building Services selected Lochinvar's cascadable Amicus Altus R290 Heat Pump system. Lochinvar provided assistance with system design, specification, and troubleshooting to ensure seamless installation and optimal performance. The hands-on support underscored Lochinvar's dedication to delivering solutions that meet and exceed client expectations.

SOLUTIONS FOR HOSPITALS & CARE HOMES

Hospitals & care homes have higher demands for heating and DHW when compared to support buildings and other sites as part of the estate. Our latest solution, Imperium™ is a complete system package, ideal for retrofit solutions or new builds. Our solution is ideal for domestic hot water profiles of 9,000 litres/hour peaks, as it reduces the need for storage thanks to the one-pass mode for peak demands. Imperium™ has a number of schemes available to suit a wide variety of profiles.

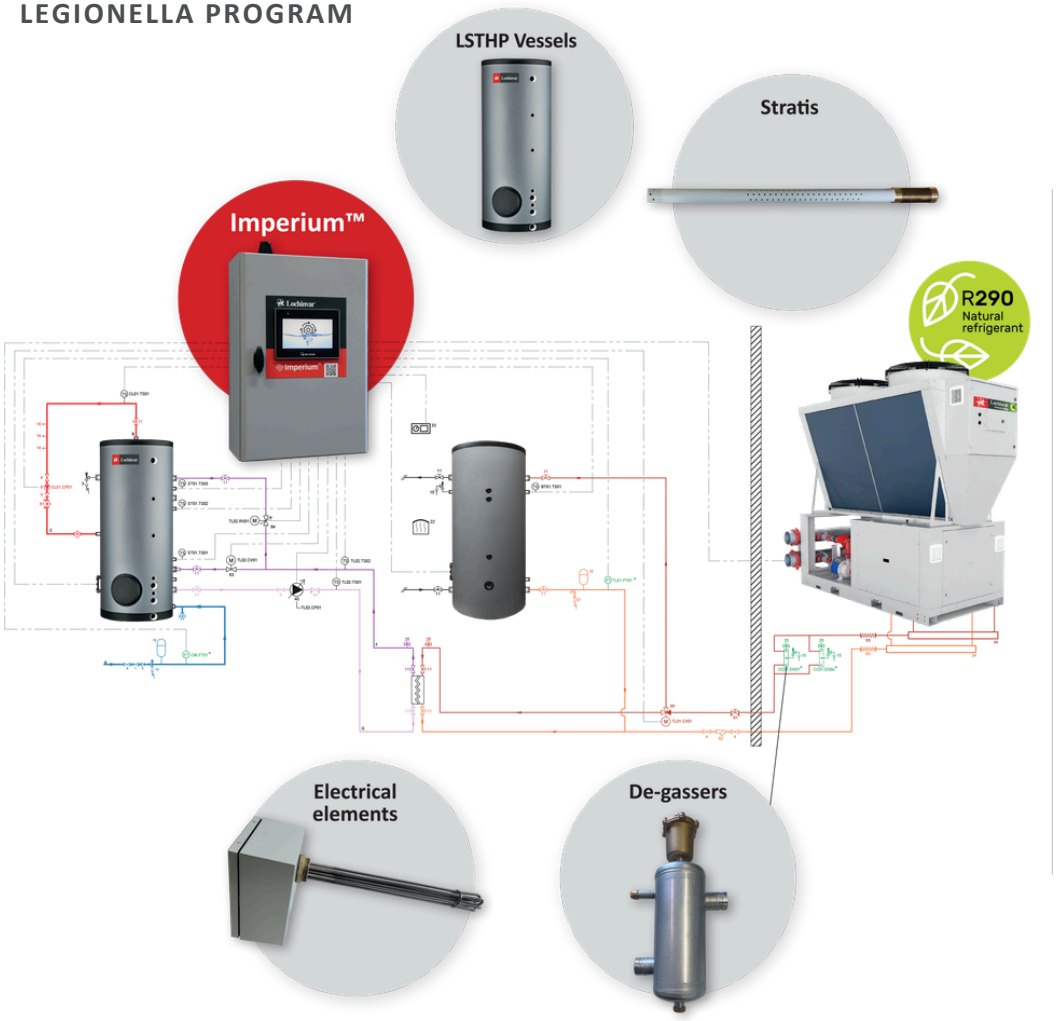
Our Imperium™ System uses our Amicus Altus Air Source Heat Pump, which is available in either 88kW or 112kW outputs. Our Imperium™ system combines our low-GWP heat pumps with an all-new system controller, dedicated tanks and destratification technology. The result of this new system is a complete solution which offers even better efficiency, flexibility and performance. Imperium™ systems require less space than traditional heat pump systems. They feature one-pass and multi-pass operational modes which deliver either instantaneous water heating for peak demands (one-pass) or efficient water heating and storage recovery (multi-pass) which helps to maximise operational efficiency of the heat pumps. Our destratification technology prevents thermal mixing in the tank and helps to ensure full tank temperature hot water is available when you need it. The new Imperium™ system controller pulls it all together, it also gives you the ability to monitor performance and system notifications in real-time, remotely all without the need to reprogram expensive BMS systems.

More information on this can be found on our website or via your local Area Sales Manager.

IMPERIUM™ SYSTEM FEATURES

Our most comprehensive heat pump package yet. Boasting the latest heat pump technology combined with our revolutionary Imperium™ system controller and tanks to provide you with cutting-edge performance.

- COMPLETE SOLUTION
- IMPROVED EFFICIENCY
- REMOTE MONITORING
- COST SAVINGS
- USER FRIENDLY INTERFACE
- EASY INSTALLATION
- REMOTE SUPPORT
- LEGIONELLA PROGRAM



OUR IMPERIUM™ SOLUTION

Our new Imperium™ packaged solution works with our latest Amicus Altus R290 air-source heat pump. It's a popular decarbonisation choice boasting the flexibility to cascade up to ten units together all while using R290 propane, a natural refrigerant.

AMICUS ALTUS
Air Source Heat Pump

Ultra-low GWP heat pump utilising R290 refrigerant. Very high operating temperatures of up to 75°C. Fully cascadable with outputs of 88kW and 112kW. Suitable for heating/cooling and domestic hot water production.

FEATURES

- Ultra-low GWP heat pump utilising R290 refrigerant
- High operating temperatures, up to 75°C
- Fully cascadable
- 88kW and 112kW models available
- Suitable for heating/cooling and domestic hot water production
- COP up to 5.5
- SCOP up to 3.95
- Able to operate in heating mode down to -20°C external air temperatures
- BMS fault and remote on/off signal
- Cascade control as standard

IMPERIUM™
System Controller

The Imperium™ controller represents a breakthrough in heat pump system efficiency and operation. Imperium™ enables our complete, packaged solution to deliver optimal performance when working together. This innovative pairing along with our Stratis and our new HPLST storage tanks are designed to simplify system integration, improve efficiency and reduce costs for our customers.

HPLST
Storage Tank

Our all-new HPLST storage tank, designed for use with our Imperium™ heat pump system solution. Our HPLST tank is compatible with our Stratis, destratification tube and features sensor points to enable the Imperium™ system controller to deliver full tank temperature hot water in the most efficient way.

SOLUTIONS FOR SUPPORT BUILDINGS

There are a number of strategies available to help hospital estates decarbonise effectively whilst keeping costs under control. Large heat pump systems can be very expensive when compared to their equivalent gas-fired solution. Lochinvar have a clever solution which is highly cost effective and ideal for the needs of most hospital support buildings.

Using our award-winning Amicus AquaStore heat pump water heater, hospitals can replace existing gas-fired or inefficient electric solutions with our internal heat pump system. By harnessing the ambient heat in a plant room, our AquaStore units can provide hot water without the need for on-site combustion. The secondary benefit is cooling of the plant room, as the system uses the heat in the room to provide hot water, the result is the room is cooled as a result of the water heating process.

KEY BENEFITS

The AquaStore has a list price of around £9,000 which is roughly 25% more than what it would cost to replace with an equivalent gas-fired solution. This makes the AquaStore solution highly attractive as a cost-effective route to decarbonise and along with the added grants that are available, it's hard not to consider. It's a solution already used by major hotel chains across the UK, manufacturing facilities, schools and commercial locations.

Unlike larger decarbonisation solutions, the AquaStore is plug and play. Electrical upgrades are usually not necessary and because they're straightforward to install, they're preferred by installers and contractors as they don't require additional considerations such as major upgrades or engineers to reconfigure building management systems.

AMICUS AQUASTORE

AMICUS AQUASTORE
Heat Pump Water Heater

PROUD WINNER 2023

8kW output - The UK's largest heat pump water heater. Quick and easy to install, boating a space saving design. Benefit from a touch screen display for custom settings and status reports. Boasting a 445 litre storage capacity, 65°C output in heat pump mode and an impressive 250L/hr recovery rate in efficiency mode @50°C temperature rise & 350L/hr in hybrid mode.

FEATURES

- 8kW output – The UK's largest heat pump water heater
- Plug & Play – Quick and easy to install with space saving design
- Touch screen display for custom settings and status reports
- Monoblock construction
- A cost effective and sustainable solution for the decarbonisation of DHW
- Utilises any buildings wasted heat rejection for maximum efficiency
- 445 litre storage capacity
- 65℃ output in heat pump mode
- 250l/hr recovery in efficiency mode @50C temperature rise & 350l/hr in hybrid mode
- Zero immersion heater input required to heat tank to 65℃
- Built in redundancy – up to 12kW immersion

Hospitals benefit from in-house expertise and capabilities such as on-site electricians and maintenance engineers. As the Amicus AquaStore is a simple installation, it can often be completed and maintained by the engineers healthcare facilities already have in place, which means the cost of implementing a decarbonised solution doesn't require large investment.

For healthcare providers, the AquaStore will ensure their reliance on traditional gas-fired methods of providing hot water are made sustainable with a reliable and robust heat pump solution. The units feature a built-in touch screen display to allow for selection of different modes, status reports and custom settings, removing the need to reconfigure building management systems which is often a costly and complex process.

FURTHER LEARNING

This guide is intended to introduce you to solutions that can help hospitals and healthcare facilities on the road to decarbonisation through heating and domestic hot water. This topic is broad and technical, and to help support consultants, contractors, specifiers and in-house hospital maintenance teams, we offer online CPD courses to help provide you with additional technical information.

Lochinvar are experts in providing heating and hot water solutions in commercial environments. As a manufacturer of water heating equipment and boilers, our solutions have evolved over time, with our origins in gas-fired technology. Our range now focuses heavily on decarbonisation solutions including full electric and both air source heat pumps and water source heat pumps. To support the growing demand for heat pump solutions, Lochinvar benefits from their own in-house Heat Pump Specialist team which provide technical support and assistance during the specification and pre-sale parts of an order.

If you're interested in joining our next online CIBSE approved CPD on Heat Pumps for Commercial Heating and Hot Water Applications. Scan the QR Code or visit our website for more information. Our CPD seminars are held regularly and are all delivered live via GoTo Webinar by our Heat Pump Specialist team.

HEAT PUMPS FOR COMMERCIAL HEATING AND HOT WATER APPLICATIONS

Presented by James Cooper, Renewables Manager at Lochinvar

- R290 Refrigerant Design Consideration
- Legislation and Regulations
- Design and Clearance Requirements
- Heat Pump Applications and System Design
- LTHW – ASHP
- DHW – ASHP
- CHW & Heat Recovery – 4 Pipe ASHP Design

SIZING & SELECTION OF DIRECT GAS-FIRED WATER HEATERS

Presented by Richard Taberner, Project Engineer at Lochinvar

- Hot water demand patterns
- Manufacturer's sizing software
- CIBSE and IoP guidelines
- Gas-fired water heater types
- Integration with renewable technologies
- Selection criteria
- SBEM implications

VIEW SEMINARS

LOCHINVAR SOLUTIONS

Lochinvar are a specialist provider of heating and cooling systems supported by a nationwide team of field engineers. Talk to our expert team today for more information about our sustainable heating and cooling systems.

HEAT PUMP PROJECT SUPPORT

As a specialist provider of heat pump systems, Lochinvar technical experts and project managers support clients throughout the entire journey, working closely with your contractors and installers. Every heat pump project benefits from project support. We do this to ensure any potential issues are remedied before commissioning to ensure systems are ready to go when they're required.

COMMISSIONING

For complete peace of mind, Lochinvar offer commissioning of new systems to ensure installation has been completed to specification and complies with regulations and requirements for safe operation.

TECHNICAL SUPPORT

Boasting a nationwide network of in-house field engineers supported by a highly experienced team of technical specialists at our headquarters in Banbury, we support clients with the most challenging issues in the rare event an issue can't be resolved by site managers and contractors.

NATIONWIDE EXPERTISE

GET EXPERT SUPPORT & ADVICE

Our team is supported by technical sales support led by our Renewables Manager. Contact our Key Account Manager for more information about our decarbonisation solutions and replacement systems for hospitals and healthcare facilities.

TOM BAILEY
Key Account Manager
07977 453733
tbailey@lochinvar.ltd.uk

JAMES COOPER
Renewables Manager
07973 803401
jcooper@lochinvar.ltd.uk