

Case Study

Mitsubishi Electric e-Series delivers rapid chiller replacement for Reading hospital



When Reading's Royal Berkshire Hospital needed to replace two aging chillers for its Maternity Block, a like-for-like replacement was going to take months to manufacturer and transport, before the removal and installation work could even start.

The introduction of three modern e-Series chillers instead, which could be ordered the next day, meant the replacement work could begin immediately, and this started a process to upgrade and replace all the chillers throughout the hospital's four main blocks.

The Capital Projects team at the Royal Berkshire NHS Foundation Trust, first approached Mitsubishi Electric to discuss a replacement of the old Climaveneta chillers on the Maternity Block around the start of the global pandemic - COVID-19.

“There were major production delays right across Europe due to the virus and it was going to take at least 10 weeks for the Italian factory to produce the replacement chillers,” explains Matt Hudson, in charge of Capital Projects for the Trust. **“We were therefore having to look at hiring expensive temporary chillers to supply cooling instead.”**

Matt was offered the new e-Series air-cooled chiller instead. These are readily available in the warehouse and not only increase efficiency and control but also take up far less space on the roof and come with extended 7-year warranties.

Working with the team from Mitsubishi Electric, Matt was able to demonstrate that there was actually very little cost difference between the hire of temporary chillers and the cost of sourcing a permanent asset.

Once the Trust’s Board saw the improvements in efficiency and control that was available with the e-Series chillers, they quickly took the decision to invest in the new equipment. With approval for the investment, Mitsubishi Electric’s own engineers then started the 12-weeks process of removing the old equipment and the much quicker process of installing three modular e-series 180kW chillers.

These are available ‘off-the-shelf’ and are specifically designed to be modular, so that up to six individual units can be connected together to provide a system capacity from 90kW to 1,080kW. Using this modular approach significantly reduces space requirements and simplifies lifting and installation.



These chillers now provide comfort cooling for the entire Maternity Block, with delivery suites, the antenatal clinic, maternity wards and day assessment units, all spread across six levels.

“I couldn’t believe how little space they take up compared to the old system,” added Matt Hudson, Capital Projects

The modular nature of the e-series allows for a design which best fits any given space and with a capacity ranging from 150kW to 1,080kW, they can save up to 35% of space compared to traditional chillers.

Once the space, time control and efficiency benefits of the e-Series became clear, the team started looking at the other three blocks in the hospital campus.

The Royal Berkshire Hospital occupies a long thin site, about 15 minutes walks from the centre of Reading. The buildings that house the hospital are of various ages, from the original building of 1839 to the latest ward block built in 2006.

Looking at the chiller units serving the other three main blocks - South, Battle and Central, Mitsubishi Electric worked with Matt Hudson and his team to install temporary e-Series chillers to help the hospital get through the summer of 2020, which also required the installation of temporary pipeworks and pumps.

This avoided the need to spend precious budget on hiring chillers.

The old Climaventa chillers were sited inside rooftop plant rooms, with remote condensers taking up space on the roof outside.

Before



After



On the South Block the Climaventa chillers were temporarily replaced with 1800kW e-Series chillers, which were installed in the car park, before the permanent installation of 10 e-Series 90kW models.

For the Central Block, the Climaventa chillers have now been replaced with 5 e-Series 180kW models, which are straightforward to link due to their built-in header unit.

The same applies to the Battle Block which houses the hospital's cardiology unit, where the Climaventa chillers have also been replaced with 5 e-Series 180kW models.

In addition to the installation of the modern, modular, inverter-driven e-Series chillers, the Hospital Trust now benefits from a 7-year warranty and Mitsubishi Electric is also supporting the installation with a 7-year Service & Maintenance contract on all of the equipment.

All of the units are also supported with centralised controllers and Mitsubishi Electric Variable Speed Drives (VSD), which help to reduce energy consumption and deliver large energy and running cost savings for the Trust.

“The Maternity Block has now been problem-free for the past 18 months and we expect the same for the other three blocks,” explained Steve Hayward, National Contracts manager at Mitsubishi Electric.

Available as a cooling only or heat pump version, the e-Series is suitable for both comfort and process cooling applications. Featuring high efficiency advanced DC inverter-driven scroll compressors, the high performance compact air heat exchanger chillers offer two-stage cooling circuit, and an internal header pipe to ease installation.



Installing the e-Series chillers in their place on all four blocks has now freed up space in those internal plant rooms and space on roof, as well as significantly reducing the weight load on the roof of each block



Battle block



Central block



South Block

Installation Summary

Outdoor Units:

Maternity Block

3 x EACV-P1800YBL-N e-Series 180kW chillers

South Block

10 x EAHV-P900YA-N e-Series 90kW models.

Central Block

5 x EACV-P1800YBL-N e-Series 180kW chillers

Battle Block

5 x EACV-P1800YBL-N e-Series 180kW chillers

e-series



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Note: The fuse rating is for guidance only and please refer to the relevant databook for detailed specification. It is the responsibility of a qualified electrician/electrical engineer to select the correct cable size and fuse rating based on current regulation and site specific conditions. Mitsubishi Electric's air conditioning equipment and heat pump systems contain a fluorinated greenhouse gas, R410A (GWP:2088), R290 (GWP:3), R32 (GWP:675), R407C (GWP:1774), R134a (GWP:1430), R513A (GWP:631), R454B (GWP:466), R454C (GWP:148), R1234ze (GWP:7) or R1234yf (GWP:4). *These GWP values are based on Regulation (EU) No 517/2014 from IPCC 4th edition. In case of Regulation (EU) No.626/2011 from IPCC 3rd edition, these are as follows. R410A (GWP:1975), R32 (GWP:550), R407C (GWP:1650) or R134a (GWP:1300).

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