



Project Showcase:

100 Molesworth Street



Formerly recognised as the State Services Building, 100 Molesworth Street is prime commercial real estate nestled in the heart of Thorndon, Wellington, housing government offices and various retail spaces on the ground level.

After the building's large unitary chiller failed in 2022, an urgent replacement was required. As a result, three Mitsubishi Electric e-Series Modular Reversible Heat Pumps and one e-Series Modular Chiller were selected by NDY Wellington to provide a space-efficient and reliable solution with a quick turnaround while also presenting an opportunity to decarbonise the building's comfort heating and cooling.

WELLINGTON



EQUIPMENT BREAKDOWN

- Reversible Heat Pumps
- Cooling Only Chiller

The Goal

In 2012, the building underwent a significant modernisation upgrade aiming to enhance energy efficiency and occupant comfort by including the installation of a new Chilled Beam HVAC system, supplemented by a 700kW screw chiller and 270kW gas-fired boilers from another supplier. However, by late 2022, the unitary chiller failed and necessitated an urgent replacement before the peak of summer.

This change of cooling plant provided the client with an opportunity to bring forward decarbonisation plans to change the heating plant from a gasfired boiler to a heat pump to reduce emissions and provide credits towards a NABERSNZ rating required for government tenancies.







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The Challenge

Coming into the cooling season, the building required an immediate replacement to ensure tenant comfort was maintained with as little disruption as possible. The existing 700kW screw chiller was installed on a plant deck which was particularly tight on space; therefore, a driving project requirement was that the new equipment must be able to be installed into the existing plant space.

The Mitsubishi Electric e-Series Solution

Mitsubishi Electric e-Series modular Chillers were the logical option to meet the quick turnaround of the project. Boasting a economic compact footprint and being available from stock held in New Zealand by Black Diamond Technologies Limited, the e-Series range presented an off-the-shelf solution that would not only fit the limited plant deck but also be supplied immediately.

Furthermore, the e-Series' availability in a heat pump model (EAHV) meant the decommissioning and replacement of the existing gas boilers could be fast-tracked. The heat pumps can deliver hot water at 55°C, aligned with the leaving HHW temperature from the existing condensing boilers.

More Environmentally-Friendly R32 Refrigerant

The R32 refrigerant used in these units has a significantly lower Global Warming Potential (GWP) than traditional refrigerants (approximately 1/3 of R410A), supporting the project's environmental sustainability goals.

Modular Design Offers Greater Redundancy and Efficiency

Mitsubishi Electric's e-Series chillers, available in 150kW and 180kW capacities, feature advanced technology, including inverter compressors and EC fans across four independent refrigerant circuits, offering greater redundancy and high efficiency.

Energy Efficient Performance at Part Loads

The Mitsubishi Electric e-Series Range is designed to optimise chiller compressor frequency based on the number of connected units, maintaining the highest part load efficiency possible. Furthermore, the run time of each unit is equalised by the control system to prevent uneven wear on the units and extend the lifespan of the system.











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BS Marine Treatment Further Protects the Outdoor Units from the Coastal Environment

While the standard e-Series models come with excellent corrosion resistance, the Coastal Protection BS models go a step further by treating external panels and other key elements to a higher degree, providing further protection from aggressive salt environments. With 100 Molesworth Street near to Wellington's iconic harbour, Mitsubishi Electric's BS Treatment was applied to the chassis, panel work and airside coil to ensure longer life compared to standard finish products in harsher sea air environments.



The Results

Three e-Series Heat Pumps (EAHV-M1800YCL-BS) and one Cooling-only Chiller (EACV-M1800YCL-BS) were installed by Advanced Building Services Wellington within the same space as the original air sourced chiller. Each 2-pipe heat pump can produce up to 180kW of heating or cooling, while the chiller can produce up to 180kW of cooling-only.

Each e-Series module has been installed with independent pumps and CHW and HHW changeover valves. This allows the system controls to operate the units individually and as a group.

The system's capacity to deliver up to 540kW of heating or 720kW of cooling—or any combination within this range—demonstrates the versatility and adaptability of Mitsubishi Electric's modular solution to meet diverse climate control needs.

The building owner can rest assured local technical support and spare parts are available from the exclusive distributor of Mitsubishi Electric in New Zealand, Black Diamond Technologies Limited (BDT). Furthermore, four health checks were carried out by BDT in its first year of operation to ensure superior performance.

When the time comes to seek sustainability accreditation, carbon emissions have been significantly reduced by the replacing gas boilers and the adopting low GWP refrigerant. Most importantly, tenants suffered minimal disruption from the existing chiller failure with the quick turnaround and now enjoy energy efficient year round comfort.







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Full Equipment Breakdown

Total Capacities

Cooling: 700kW Heating: 540kW

e-Series Modular Chiller System

3 x EAHV-M1800YCL-BS Reversible Heat Pumps 1 x EACV-M1800YCL-BS Cooling Only Chiller

Contractor:





Consultant:

Property Manager:



Agile Property Management Limited

Property Owner: Zircon Properties Ltd