

# Thomastown Health Centre

A sustainable heating system using Thermocold Domino EXR Heat Pumps



## The Health Centre

Thomastown Health Centre was built in 2021. The building provides an easy access point to local health services such as GPs, physiotherapy, public health nursing, occupational therapy, speech and language therapy services, dental services, and support for chronic illnesses, cardiac, diabetes, and respiratory illnesses.

## Project Background

This building has space heating and significant high-temperature water demands for sanitation purposes.

As the project was a new build, it needed to comply with the latest building regulations. The European Energy Performance of Buildings Directive Recast (EPBD) requires that all buildings acquired by public bodies be NZEB compliant by 31st December 2020.

The primary objectives of the installation were to:

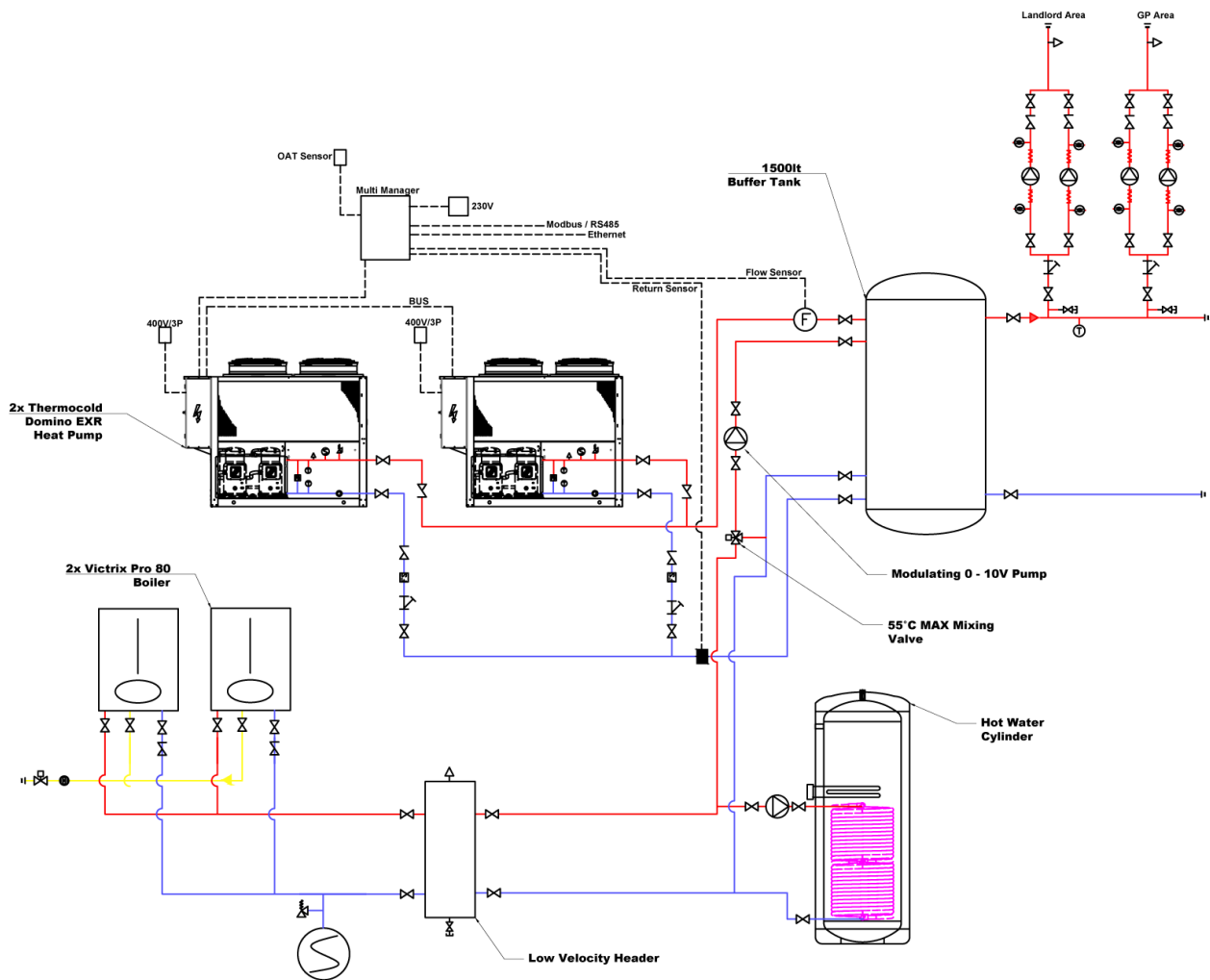
- Provide space heating and hot water heating for the building
- Provide a cost-effective solution for the heating of the centre
- Comply with current regulations for new buildings and optimise the use of renewable energy
- Minimise the use of fossil fuels
- Deliver the necessary performance under all possible Irish weather conditions

# Installation at Thomastown Primary Healthcare Centre

A model of the performance of the building was developed using the EN14825 methodology.

In order to comply with the regulations and meet the NZEB requirements, it was decided to use a hybrid heating system consisting of high-temperature heat pumps combined with modern high-efficiency gas boilers.

The combination of heat pumps and boilers resulted in a lower capital cost while remaining NZEB compliant.



Two Thermocold Domino EXR 170 three-phase air/water heat pumps with a nominal capacity of 76kW each were installed. The high-temperature heat pumps have SCOP data available at 55°C. This is necessary to achieve building regulation compliance.



These supply a 1500L buffer tank and can meet the heat load of the building during most of the year.

The heat pumps are supported by two Immergas Victrix PRO 80kW natural gas boilers, which provide additional capacity when required. DHW is heated by a 1000 L TML water heating tank. This is manufactured from 316 Stainless Steel.

This hybrid heat pump/ boiler solution ensures a lower capital cost than a heat pump-only system.

# Equipment selected

## Thermocold Domino EXR heat pumps

The Domino EXR is a commercial three-phase heat pump from Thermocold, a leading Italian manufacturer of chillers and heat pumps. Thermocold is a division of Trane Technologies.

The Domino EXR can deliver water at temperatures up to 65°C and is available in heating capacities from 59kW to 168kW. They may be cascaded to provide larger capacities. They are ideal for many commercial applications.

Domino EXR units are characterised by an extended operating map and can reach high outlet water temperatures even at extremely low outdoor temperatures. The ability to provide 65°C water at an outdoor temperature of -10°C allows operation year-round with medium or high-temperature heat emitters.

The Domino EXR units are designed in compliance with the ErP Directive 2009/125/EC. Ecodesign-compliant EN14825 data is available for low (35°C) and medium temperature (55°C) applications.

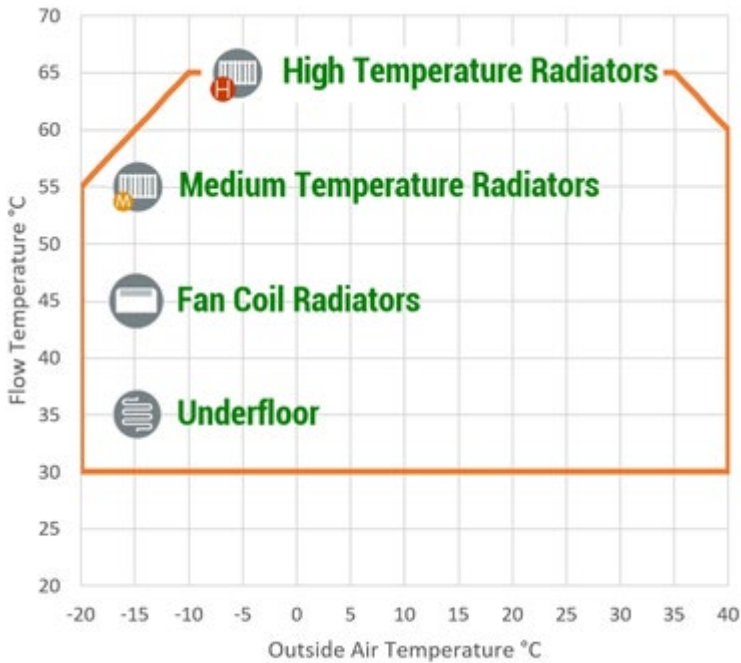


### Features:

- Scroll compressor optimised for heat pump operation with innovative vapour injection system
- Propeller-type fans with Inverter technology
- Stainless steel AISI 316 brazed plate type condenser complete with differential pressure switch and antifreeze protection electric heater
- Evaporator coils with seamless copper tubes and aluminium fins
- Electronic expansion valve
- Advanced microprocessor control
- Pump speed control function to optimise inlet temperatures
- Reversible - can also provide cooling
- Weather compensation

# Operating envelope

The Thermocold Domino EXR range is equipped with liquid injection technology and can maintain flow temperatures of 65°C under adverse weather conditions. This is not possible with conventional heat pump technology.



# Control

A BMS system is used to manage the system.

Thermocold's Multi-manager controls the two Domino EXR heat pumps in cascade. It provides convenient central control with high versatility.

The thermal loads required may be distributed equally between the units for optimum load matching, efficiency, and reliability.

Communication between the Multi-Manager system and each unit is performed via an RS485 serial connection.



## Victrix PRO boiler

Two Immergas Victrix Pro 80 2 ErP boilers were installed to provide additional heating capacity.

The Victrix PRO 2 ErP range are high-efficiency condensing gas boilers with capacities from 35kW to 120kW available. They are suitable for installation as standalone boilers or as part of a cascade of up to 600kW / 5 boilers.

They are ideal for commercial applications. The boilers comply with the EU ErP directive, meaning that the boiler is fuel efficient and Eco Labelled.



### Features:

- 4-star Energy Efficiency (92/42 EU Directive)
- Improved modulation range of 10 - 100% to exactly match heating needs
- Up to 5 boilers may be installed in a cascade installation
- Compact dimensions allow flexible installation
- Weather compensation may be activated by connecting the optional outdoor sensor, automatically allowing the boiler to adapt its operating temperature to the prevailing weather conditions
- A temperature sensor may be mounted on the water heating tank and directly connected to the boiler. Hot water is then produced automatically on demand
- Long-life heat exchanger manufactured from 316L stainless steel
- Inbuilt frost protection
- The boiler has a protection index of IPX5D and is approved for outdoor and indoor installation



## Applications

The Thermocold Domino EXR heat pump is ideal for both new buildings and retrofits.

Applications include:

- Hotels
- Hospitals
- Nursing Homes
- Gyms and sports centres
- Food production
- Commercial buildings



## Parties involved in the project:

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