Water-based air conditioning is the first port of call

Air Conditioning

A new, state-of-the-art logistics facility in Doncaster is using a unique, water-based air conditioning system to deliver energy efficient heating and cooling.

Case Study

iPort / Doncaster

Mitsubishi Electric's HVRF is a two-pipe system capable of simultaneous heating and cooling. Its ability to ensure stable air temperatures and flexible controls make it an ideal solution for modern office buildings

iPort is a brand new 337-acre development site in Doncaster, offering six million square feet of logistics space and its own 35-acre dedicated strategic rail freight terminal.

The very first building to be constructed on site was a 7,500 square foot two storey office connected to a warehouse unit. The office building will act as a base for support staff directing operations at the company and incorporates open plan office areas, segregated office areas, a canteen, a post room and a reception.

In a modern facility such as this there is a clear need for an efficient heating and cooling system that can provide high levels of comfort for staff.

A four-pipe chiller system was initially considered as the proposed tenant was an advocate of the more traditional approach. However, with plant space at a premium an Hybrid Variable Refrigeration Flow (HVRF) solution was identified as a perfect alternative, combining the comfort and efficiency required with design flexibility and smaller external plant space.

The system uses advanced refrigerant technology in the pipes that run between the outdoor unit and the Hybrid Branch Controller (HBC) before transferring energy around the building via a pair of water pipes. This keeps refrigerant away from occupied spaces and means that a leak detection system is often unnecessary.

Before work began, the end user, developer and design consultant were all offered a demonstration. After recognising that HVRF could provide comfort levels to match a four-pipe system and witnessing its intuitive, advanced controls first hand, the decision was taken to make HVRF the standard air conditioning solution for buildings across the development site.

Case Study

iPort / Doncaster

> “Plant space restrictions and the need for simultaneous heating and cooling in different areas of the new iPort building made the decision to implement a two-pipe HVRF system a straightforward one”

Gareth Whitaker
Design Consultant,
Silcock Leedham
Consulting Engineers

Alongside the requirement for staff comfort and high levels of efficiency, ease of maintenance was a key consideration for the developer. The HVRF system allows for the implementation of a full system maintenance plan instead of the separate system inspection associated with a four-pipe chiller, thereby simplifying the entire maintenance process.

Part L of the Building Regulations is centred around improving energy efficiency in new buildings through the conservation of fuel and power. In order to comply with Part L the developer recognised the need for a single highly efficient system that could deliver reduced carbon emissions without compromising performance in any way. The HVRF solution readily fulfilled this criteria and the system’s capacity for heat recovery further broadened its appeal.

Gareth Whitaker, a design consultant at Silcock Leedham Consulting Engineers, worked with The Buckingham Group, the design and build contractor working on behalf of the end user, to create design proposals for the development. He comments: **“Highly efficient heating and cooling solutions such as Mitsubishi Electric’s HVRF can make all the difference when working towards Part L compliance and this system will help achieve a comfortable working environment in the new offices”**.

To ensure complete control over the new state-of-the-art system, an AE-200 centralised controller was chosen as the ideal system management interface. Giving end users control over temperature and airflow at the touch of a button, the AE-200 displays energy consumption rates in individual areas, making use of easy-to-view graphs to display the data.

Allowing employees to make changes in individual rooms, PAR-32 wall mounted controllers were also specified at the iPort development.

With the first building now complete, Mitsubishi Electric HVRF systems are set to feature in a number of the new developments at iPort, promising highly efficient heating and cooling allied with a comfortable working environment across the site.

Installation Summary

CITY MULTI | Mr.SLIM | CONTROLS

Equipment:

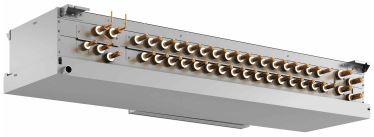
- 4 x PURY-P YLM-A1 City Multi outdoor units
- 10 x CMB-WP HBC Controller
- 59 x PEFY-WP-VMA-E ducted indoor units
- 40 x PAR-32MAA remote controllers
- 1 x AE-200E touch screen centralised controller
- 1 x MelcoBEMS

Server Room:

- 2 x PUHZ-ZRP100VKA2 Mr Slim Power Inverter outdoor units
- 2 x PKA-RP100KALR1 indoor units
- 1 x PAR-32MAA

PEFY-WP-VMA-E ducted indoor units

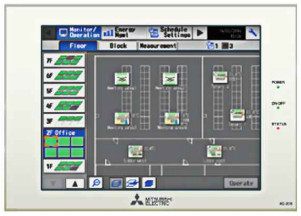
PURY-P YLM-A1



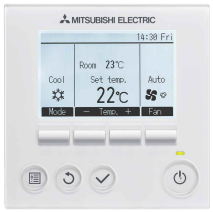
CMB-WP HBC Controller

PUHZ-ZRP100VKA2

PKA-RP100KALR1 indoor units



AE200



PAR-32MAA

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Changes for the Better

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Note: The fuse rating is for guidance only. 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), R32(GWP:675), R407C (GWP:1774) or R134a (GWP:1430). *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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