

Fruit Night Club

AHU with direct expansion VRF

Clubbers in Hull are being kept comfortable by an efficient and flexible VRF air conditioning system from Fujitsu.

Original plans for the project at the Fruit night club in the thriving Fruit Market and Humber Street area centred on a heating-only proposal using gas boilers, but it was decided to install a modular Airstage V-III heat pump solution, supplied by Cool Designs Ltd (CDL).

The installation was carried out by Hull-based mechanical contractor Neville Tucker Services (NTS) and the system provides cooling, heating and ventilation through the air handling unit (AHU), with mixed return and fresh air.



Fujitsu Airstage V-III heat pump VRF being positioned on the roof plant compound

Fujitsu equipment was chosen because of its simple integration with the third party AHU and touchscreen control system, and its ability to use VRF condenser units on an AHU rated down to -5°C ambient conditions and 3°C air on coil.



Recirculation AHU with full fresh air capabilities and direct expansion heat exchangers

Shaun Lamming, Senior Technician at NTS, said: "We were tasked with the challenge of installing a flexible solution able to operate efficiently in low ambient conditions, in a residential area where noise and aesthetics are critical. We were able to do this by working closely with our suppliers and installing an in-house building energy management system which allows for close control of the associated equipment."

The AHU ventilation rate is CO2 and temperature

regulated, so that when fewer people are in the club, fresh air introduction is reduced and the AHU operates more air recirculation. When the system starts, the AHU is in full recirculation mode reaching a room temperature of 20°C, with fresh air then mixed depending on CO2 levels.

Effective and efficient

With 350 people in the club the system is in full fresh air mode. The rooftop Fujitsu Airstage V-III heat pump, twinned with four Fujitsu DX EEV kits for AHU integration, is capable of raising the temperature from -5°C in winter to 16°C and can provide cooling without pumping large quantities of cold air into the building when fully occupied.

Fruit is surrounded by residential buildings and one concern was music affecting nearby homes through the ductwork, with attenuation used to reduce the impact.



Fujitsu Airstage V-III providing direct expansion cooling and heating via AHU

Consultant Rob Smelt, Director of BREng in Hull, said that the client wanted to create an attractive venue in a key area of the city, and deliver an effective

and efficient solution for climate control. He added: "The original project design would have used a lot of mechanical plant when space is tight and the noise element crucial. It also offered no cooling and was non-renewable.

"We designed a cost-effective solution providing ventilation with heating and cooling from a renewable source. It is controlled by both temperature and CO2, maximising efficiency and comfort when the venue is used as a night club or as an exhibition hall during the day."

Outstanding support

Andrew Gill, Regional Sales Manager at CDL, said: "The Fujitsu equipment is fantastic. I believe it is the only system on the market able to rejoin refrigerant pipework after expansion to reduce the number of DX coil paths.

"It was selected because it can operate as a DX method of heating at -5°C ambient with an air on coil temperature of 3°C at a high COP (3.8 at -5°C ambient).

"We also had outstanding support from Fujitsu from the design stage through to commissioning."

Nick Wilks, National Distribution Sales Manager at Fujitsu, said: "CDL has been a Fujitsu customer for seven years and has great technical capabilities in terms of design and specification, as well as being VRF and project focused.

"In terms of the installation, our DX systems are really simple to integrate with third-party equipment, so it's good to see that making a difference."

Equipment

- Fujitsu Modular Airstage V-III Heat Pump
- 4x Fujitsu DX EEV kits
- 0-10V BMS connection to Fujitsu equipment

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