Daikin's Success Around The World: Manchester. UK

Daikin VRV-WII Water-Cooled Air Conditioning in Manchester's 'Eye in the Sky' Hilton Hotel Complex.

Air conditioning for the hotel's 285 bedrooms, reception, restaurants and meeting rooms etc. is provided by 25 Daikin water-cooled heat recovery VRV-WII condensing units, supply a total of 328 Daikin indoor fan coil units, which are being installed by Daikin D1 installer, Booth Imperial. A further 3 air-cooled VRVII systems serve the landlord's ground floor reception facilities for the apartment accommodation. Each of the hotel's guest accommodation floors is served by a heat recovery type RWEYQ condensing unit (nominal capacity 26.70kW and 31.50kW (7.4 Ton and 8.8 Ton) cooling and heating respectively), housed in a service closet and linked to 15 fan coil units located in bulkheads above the bedroom doors. Due for completion shortly, the hotel forms part of a visually striking 171 meter high residential development complex, known as the Beetham Tower and said to be the tallest UK residential building outside London. The hotel takes up the 5th to 23rd floors of the 43 storey tower, the remainder being given over to some 220 or so luxury apartments and an innovative 24th floor 'Sky Bar'. The condensing units for the public areas are located in a podium plant room. Each unit is connected by a two-pipe flow and return water circuit to LPHW boiler plant and an air-cooled heat rejection chiller at rooftop level. Each boiler plant maintains water at between 20°C and 35°C (between 68°F and 95°F) and is supplied to the circuit via a pressurization unit. The chiller cuts in when the temperature exceeds 35°C (95°F) and shuts down when it reduces to 32°C (90°F). Boiler start up and shut down are at water temperatures of 20°C and 23°C (68°F and 73.4°F) respectively.

Guests at the stunning new, design led Hilton Manchester Deansgate Hotel will not only enjoy the stylish, contemporary décor and service commensurate with 5 star Hilton status, they will also benefit from the unrivalled comfort associated with 'state of the art' Daikin water-cooled VRV-WII air conditioning.

Total cooling and heating loads are approximately 600 and 660kW (approximately 180 tons). During the heating cycle, heat is absorbed from the water circuit and transmitted via a plate heat exchanger within the condensing unit casing to the refrigeration circuit and then to the exhausted to atmosphere by the chiller, which cools the water to within the design temperature parameters. Heat recovery is achieved by utilizing heat absorbed from the water circuit for indoor units in heating mode and rejecting heat to the water circuit from indoor units in cooling mode. In addition, heat recovery is also achieved via the refrigeration circuit. This two-stage heat recovery process achieves exceptional EERs. The selection of a chiller for heat rejection purposes was determined by its smaller foot print when compared to those of a dry cooler or cooling tower. The tower block is in fact, extremely slim and space for the boiler plant is at a premium. Daikin water-cooled VRV-WII air conditioning was selected for this project because a conventional chiller/LPHW based 4-pipe fan coil system would not meet Part 'L' Carbon emission requirements and a major redesign of the building would have been necessary to overcome this problem. Also, the VRV-WII system provides the client the added benefit of the Enhanced Capital Allowance and its attendant savings in capital outlay. System control is provided via simplified room controllers interfaced through a LON gateway to the hotel's 'Fidelio' booking system. Three operating modes are available – 'room not booked / unoccupied' with a wide band of control between 18 and 28°C (64.4°F and 82.4°F), 'room booked' with a band width of 16 to 26°C (60.8°F to 78.8°F) and 'room occupied' operating at a room controller set point of 22°C (71.6°F).

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