

# Exhibition Centre Liverpool

## Case study



### About

In 2015 the doors will open on a brand new 8100 square metre state-of-the-art exhibition centre and hotel in Liverpool, UK. The latest addition to ACC Liverpool, currently home to BT Convention Centre and Echo Arena, and located on the city's iconic waterfront, the new complex is reported to be the only purpose-built interconnected arena, convention and exhibition centre in Europe.

The latest example of their successful partnership since air handling unit manufacturer Barkell and cooling specialist Airedale International joined forces in 2014, the two businesses worked in conjunction with the M&E contractors responsible for the project to design and engineer an energy efficient, resilient cooling solution that represents best value for money.

### Barkell solution

- 17 combined air handling and refrigeration units and 5 air handling units
- The combined air handling /refrigeration units comprise:
  - Integral mechanical (DX) cooling
  - Low pressure hot water (LPHW) heating
  - Heat recovery via thermal wheel
  - Electronic Expansion Valves
  - F7 filtration
- Integrated control panel and strategy for refrigeration and air handling with recirculation for early morning start-up boost
- Air volumes between 1.71 and 13.5m<sup>3</sup>/sec
- Enviropack available in three sizes and 24 configurations:
  - Cooling only – 12 models (10-235kW)
  - Heat pump – 12 models (9-218kW)

# In more detail

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## Energy efficient cooling

The solution comprises 17 roof-top mounted combined air handling and refrigeration units, in varying sizes, complete with integrated controls. The units feature a variation of Airedale's Enviropack cooling/heat pump system which is available in a number of configurations suitable for a range of duties or supply air temperatures.

The Enviropack is an integral packaged unit which removes the need for external chillers, dry coolers or condensers, simplifying installation and minimising the volume of refrigerant required. The single or dual circuit packs with up to two compressors per circuit provide up to four staged cooling control, maximising part-load efficiencies to generate energy savings. Thermal wheels provide a minimum heat recovery efficiency of 65% in both summer and winter operation to minimise mechanical heating and cooling loads. The units also incorporate Electronic Expansion Valves (EEVs) which improve EER (Energy Efficiency Ratio) by up to 30% compared with standard thermostatic expansion valves and deliver very accurate refrigeration control at part-load and lower ambient conditions with a reduced condensing pressure. The refrigeration components are fitted to a skid, complete with integral control panel, simplifying assembly within the air handling units.

The structure and components are designed to preserve unit life against corrosion associated with the site's coastal location.

A further five air handling units were also supplied.



## Enhanced performance

The integrated controls panel allows the client to better manage both refrigeration and air handling performance through staging of the compressors and circuits. Unit life is also extended and redundancy provided by rotating compressors on an hours run basis. Units are capable of integrating with the site Building Management System (BMS).

## Simplified installation

All assembly work and testing was carried out before despatch from the plant, saving valuable time and costs once units were delivered to site, with final commissioning of the controls and refrigeration equipment to be carried out on site by Barkell engineers.

## Benefits

- Energy efficient combined air handling and cooling solution with four stages of cooling and minimum heat recovery efficiency of 65% in both summer and winter through thermal wheels
- No need for external chillers, dry coolers or condensers, simplifying installation and minimising the volume of refrigerant required
- Integrated controls panel allows performance to be precisely managed, extends unit life and provides redundancy
- Can be integrated with any Building Management System (BMS)