Case Study

Brunel University's refrigeration test centre upgrades to CO_2

Services: Refrigeration and Design Services

Products Used

- Condensing refrigeration packaged units using the natural refrigerant CO_2
- Thermowell sensors and pockets, custom designed to meet standard BS EN 23953
- Flow rate meter and shut off valves
- Non-return valve arrangements around the shut off valves
- Danfoss pressure transducers

Project Overview

Brunel University London hosts a dedicated Centre for Sustainable Energy Use in Food Chains (CSEF). The Centre has extensive experience of working with a wide range of refrigeration systems as part of its test centre.

These include three state-of-the-art environmental test chambers in which tests of different refrigeration systems can be carried out, and power computer work stations for computational research.

The Centre works closely with a number of refrigeration system display manufactures and food retailers providing key information regarding system designs, testing and performance optimisation.

Brunel University approached Orwell Design Associates to upgrade some of its existing refrigeration cabinet test rooms, moving from HFC systems to CO_2. With the refrigeration industry shifting from HFC to natural refrigerants, Brunel University needed a CO_2 solution which would be capable of adapting to the various demands placed on it during test procedures.

The project was unique in terms of its application and required many customised system elements, as off-the-shelf products were not in line with the latest standards and requirements for equipment testing.

For further information on how Orwell Design Associates can help your business, please contact:

Tel **+44 (0)1473 556 705**
Email **info@orwelldesignassociates.co.uk**
Visit **www.orwelldesignassociates.co.uk**

orwell design associates

Brunel University's refrigeration test centre upgrades to CO_2

Challenges Faced

The project was unique in terms of its application and posed several challenges. Because the CO_2 refrigeration systems were being used in a test environment, the component layout and dimensions had to conform to BS EN 23953 testing standards.

The systems needed to have small variable capacities and be able to contain CO_2 refrigerant within the pipework when not connected to a fixture.

The intricate nature of the project also required Orwell Design Associates to design the thermocouples and pockets for small diameter pipework to ensure flow rate wasn't compromised, whilst achieving a high level of sensing accuracy. This meant that we also had to source very specific components made to withstand high design pressures.

Our Solution

Orwell Design Associates supplied and installed a small capacity CO_2 condensing units connected to a precise arrangement of components to enable conformity to BS EN 23953 for the testing of cabinets. The condensing unit is designed as an integrated unit with a cabinet including compressor, liquid receiver, controller and gas cooler.

"The CO_2 refrigeration systems installation was completed successfully and in line with our original brief. The help and support provided throughout the project was particularly valuable, especially by the Technical Engineers, and it was a pleasure to work together on this project."

- Kostas Tsamos, Brunel University

Benefits

The new CO_2 refrigeration systems designed by Orwell Design Associates and installed by Space Engineering Services allows the Centre to test remote display cabinets for both medium and low temperature applications. The two parallel installed systems have a capacity of 8 kW and 4 kW for medium and low temperature applications respectively.

The new installed refrigeration systems and integrated CAREL plant supervisory system give more flexibility in terms of using, operating, controlling or monitoring the system to achieve the desired operation settings for each test.

The new solution which Orwell Design Associates implemented has enabled the Centre to embrace the very latest refrigeration technology, ensuring their research and findings continue to provide valuable insight for sustainable solutions in the food chain.

"Working on this project was an exciting challenge. It required us to source and integrate precise components to deliver a system design that satisfied Brunel University's needs and, importantly, conformed to industry standards."

Lewis Knights, Design Engineer, Orwell Design Associates

For further information on how Orwell Design Associates can help your business, please contact:

Tel **+44 (0)1473 556 705**
Email **info@orwelldesignassociates.co.uk**
Visit **www.orwelldesignassociates.co.uk**

oda
orwell design associates