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NATIONAL HEAT PUMP AWARDS HIGHLY COMMENDED 2013

rac COOLING INDUSTRY AWARDS 13 CLIMATE CENTER FINALIST

Carluccio's - Medowhall, Sheffield: Panasonic Aquarea - Air to Water Heat Pump

Problem, Requirements & Solution

Steve Kaddish, development manager for Carluccio's, approached installation company, FWP Air Conditioning and supplier, Oceanair after realising that they needed a more energy efficient way of providing a hot water supply to their new restaurant in Medowhall, Sheffield.

Existing electrically heated systems that currently service other branches are proving to be inefficient and resulting in extremely high running costs. Carluccio's wanted to reduce their energy bills as well as their carbon footprint; they wanted a system that was easy to use and was energy efficient and cost effective to run.

Stuart Frudd of FWP Air Conditioning was asked to install a system, which would provide the desired volume of hot water, at the correct temperature while at the same time reducing energy costs. Having looked at the design criteria with the customer it was established that the best solution for the client would be to install an air to water heat pump.

With high Co-efficiency of performance (COP) approximately 4-1, along with energy efficiency and environmentally friendly, it was the Panasonic Aquarea air to water heat pump system that would provide Carluccio's with the perfect sustainable solution. The attraction of super energy-efficient heat pump technology continues to grow and with the Government continuing to demand that businesses make big cuts to their carbon emissions, heat pump technology can help them to do so in an efficient way.

The restaurant had sufficient space for the condensing unit to be situated within the kitchen ceiling void and room for the hot water tank to be positioned within the storage cupboard.

A 12kW Aquarea T-CAP mono bloc unit was installed, which would allow for the free air from the kitchen roof space to be transferred through the condensing unit providing hot water at the optimum temperature. With a high (COP) for every kW of electricity the system uses, it provides approximately 4kW of energy. This makes the Aquarea far more cost effective than a conventional heating system.

The T CAP (Total Capacity) line-up from Panasonic is able to maintain the same nominal capacity even at -20 °C without the help of an electrical booster heater. T-CAP is also able highly efficienct, whatever the outside temperature.

> *"Payback in 18 months"*

Compact mono-bloc air-to-water heat pumps are perfect for where space is at a premium as it was in the restaurant. Panasonic's Aquarea 12kW mono-blocs combines the outdoor and indoor units into one package that was simple to install and easy to operate.

Unique to the Install

Along with the exceptional qualities of the Panasonic Aquarea, Oceanair and FWP not only provided a solution to Carluccio's water supply requirements but they also provided cool air to the kitchen. This was done by the warm, filtered air from the kitchen being drawn through the condensing unit and the air off being pushed back into the kitchen via air transfer grills within the ceiling tiles.

FWP Air Conditioning installed a copper interceptor coil within the kitchen extract ductwork. This was done because the kitchen cook line produced so much hot air during cooking, which once extracted up the ductwork and out to atmosphere, that heat is wasted. This free heat is recycled and utilised by the air to water heat pump. With the temperature of the air in the extract duct approximately 45 – 55°C the incoming water travels through the interceptor coil within the extract duct increasing the water temperature before reaching the water tank. This helps the heat pump unit by the incoming water being pre – heated; the system does not have to work as hard to heat the water for the restaurant and ultimately reduces running costs.

Alison Stanton, Development Director at Carluccio's said: *"We strive for sustainability wherever possible right across our business and were keen to trial air to water heat pumps at our new Sheffield restaurant. The results of the trial show us that we can achieve significant savings on our energy costs as well as reducing our carbon footprint. We hope to now install Aquarea units at all of our new developments and retro fit ASHPs to our existing 50 restaurants."*

Energy Monitoring & Cost Savings

Megaflow System:
Weekly usage: 693kW x 52 weeks = 36,036kW
@ 10p a kW running costs = £69.30 per week
£69.30 x 52 weeks = £3,603.60 per annum

Aquarea Heat Pump System:
Weekly usage: 183kW x 52 weeks = 9,516kW
@ 10p a kW running costs = £18.30
£18.30 x 52 week = £951.60 per annum

When Carluccio's compared the Sheffield site to their Leeds restaurant, the energy savings were considerable. To heat the water for their Leeds restaurant cost £3782 per year, whilst at the Meadowhall site the comparable cost was just £951. These sizable savings mean the site will see a return on investment in about 2 years and has achieved a COP of about 3.91.

Further energy monitoring data was collected later on in the year, over a 120-day operating period. Like for like and site for site comparisons showed that if you take into account the Climate Change Levy (CCL) of 0.0524p/kwhr that all businesses pay for their electricity, then the savings achieved on Meadowhall vs. Leeds will be £4,221.09 per year.

However, Meadowhall is using 220,000 litres over a 120-day period and Leeds is using 182,036 litres, just over 20% more water. Meadowhall as it stands will save Carluccio's 71.5% of their running cost at Leeds or £4,221 a year, achieving payback in approximately 18 months.

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