Dimplex®

Case Study

Harbour Lofts, Acorn Property Group

ACORN

The Zeroth Energy System delivers a compliant ambient loop solution for the Harbour Lofts regeneration project

The intention behind the Harbour Lofts project was to redevelop the former restaurant and bar at Poole's Quayside, that closed several years ago, and rebuild it into a modern mixed-use development that would fit the local narrative. The commercial unit on the waterfront brings a modern urban feel to the Quayside. The nine contemporary apartments are designed to connect the occupiers with both the historical heart of Poole Old Town and the natural beauty of Poole Quay and beaches. Bespoke housebuilder Acorn Property Group wanted to deliver a project that would help transform this part of the town without impacting on the environment.

Acorn acquired the site in 2016 already aware of the challenges regarding the regional compliance, in terms of aesthetics, and the requirements for on-site renewables. Traditional heating systems did not meet the carbon performance required for the building and the restrictions on what could be installed on the exterior of the building limited the options for suitable low-carbon heating technology alternatives. Thermal & Acoustic Solutions Ltd, specialists in building regulations and compliance, were contracted to work with Acorn to find a solution which would see the boutique project through to fruition.

A history of cooperation on challenging projects over the years meant Thermal & Acoustic Solutions Ltd looked to Dimplex, part of Glen Dimplex Heating & Ventilation, for support in proposing a compliant solution that could overcome the external restrictions. The flexibility of design within the limited space of the footprint of the building and a financial benefit to the end-user were equally important.

The Zeroth Energy System delivers a low-carbon, energy-efficient heating system alternative

The Zeroth Energy System, by Dimplex, in collaboration with key residential developers, was the ideal solution to address the issues around the limitations on installations on the exterior of the building and the low-carbon energy delivery. The ambient loop solution with in-apartment water-to-water heat pumps can provide hot water, heating and cooling to the apartments whilst minimising the heat distribution losses that we often see in buildings with traditional high-temperature heating systems.

The central loop of the Zeroth Energy System is designed to run at 25°C, a significant reduction from the 80°C of a traditional high-temperature system, reducing heat losses by up to 90%. Addressing heat loss through intelligent design significantly improves the energy efficiency of the system. The specification of low-carbon plant and internal air-source heat pumps make this a highly compliant system with low-carbon output. The flexible design of the Zeroth Energy System promised to deliver on the external space restrictions and Harbour Lofts became a flagship 2019 project for this innovative system.

As part of the process, Dimplex took Thermal & Acoustic Solutions and Acorn to visit the demo system in Ireland, where a fully functional rig replicates how the system would perform in a live environment. The purpose-built mini testing block consists of individual pods that represent rooms in an apartment with a variety of emitters. The pipework was left exposed so the heat loss could be demonstrated. The facility offers visitors an insight into how the flexibility of the system allows for future reconfigurations or connections to different energy sources or district networks.

The final design of the Zeroth Energy System for Harbour Lofts, proposed by Dimplex, featured an apartment-to-apartment heat pump system with internal air source heat pumps (ASHP) to help with the acoustic performance aspect of the building. A buffer tank was installed in the plant room. This fed the central ambient loop which in turn passed the work on to the individual apartment heat pumps.

Wet emitters and underfloor heating provide comfort heat within each apartment. The high coefficient of performance (CoP) of the ambient loop, along with the seasonal coefficient of performance (SCoP), reduced the energy required for optimal heat distribution within the building. The design of the system also allowed for the installation of an internal ASHP in the plant room eliminating the need for any external wall-mounted heat pump units on the building.

Although the Zeroth Energy System comes preplumbed and prewired to ensure quick installation without the requirement for a specialist contractor, Dimplex worked closely with all parties throughout the construction phase, offering onsite support. This relieved the scheduling pressures in the final phase and helped to keep the project costs down.

The Zeroth Energy System helps deliver the exclusive, high-specification apartment design to suit the modern Quayside lifestyle

Within Harbour Lofts, the large floor to ceiling windows, balcony and open plan design of the apartments are the foundations of the bond with the surrounding history and nature. The clean and modern feel of the apartments emphasises the views.

The design of the in-apartment heating systems needed to work within the limitations of the utility cupboard's space and remain in keeping with the aesthetics.
A variety of heat emitters were explored, and wet underfloor heating was specified to fit with the design goal. The controls specified for each apartment mean the occupants can control the heating levels and be in charge of their energy usage. The apartment's internal Zeroth Heat Pump unit met size specifications required for the prefabricated utility cupboards and left sufficient space for the installation of a washing machine or dryer.

The Zeroth Energy System is not simply a solution that offers design freedom by keeping the heating system out of sight. Through reductions in heat losses within the building, the system presents the end-user with lower energy bills and a low-carbon energy supply. Green credentials are fast becoming an important selling point for aspiring homeowners..

Another design feature of the system aimed at occupant comfort with ease of service and maintenance. The communal design of the Zeroth Energy System means that maintenance is focused mainly in the central plant and does not require access to the apartments. In the unlikely event of an issue with the in-apartment heat pump, the unit can be simply switched for another, whilst the immersion heater within the cylinder allows for uninterrupted hot water supply to the occupant in the meantime. The 2-year guarantee of the Zeroth heat pump unit offers additional valuable peace of mind.

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