

Electricity North West



Electricity company 'earths' depot trial net zero carbon project

Regional distribution network operator (DNO) Electricity North West has put a Daikin low carbon solution to the test, boosting its drive towards a net zero carbon operation.

This significant forward step involves a water-cooled VRV W+ ground source heat pump air conditioning system, which maintains year-round stable and comfortable temperatures inside a key part of its Chadderton depot in the Oldham area of Greater Manchester.

Electricity North West is responsible for keeping power flowing to 2.4 million properties in the North West of England.

The company owns, operates, manages and maintains a network that distributes electricity to homes and businesses through 13,000km of overhead lines, 43,000km of underground cables and 38,000 transformers.

Chadderton is one of several depots supporting the regional network.

Aiming to achieve net zero carbon status wherever possible, the company has switched the Chadderton depot's two-storey office building to the Daikin system for heating and cooling. The Daikin condensing unit is cooled through a water loop in three 150-metre boreholes near the building.

The building consists of an open plan office on the ground floor, with a smaller open plan area and two meeting rooms of different sizes upstairs. There is also a small communications room. Estimated peak loads are 19.23kW (cooling) and 18.26kW (heating).

Year of installation

› 2022

Project requirements

- ☒ Air conditioning
- ☐ Air curtain
- ☐ Air purification
- ☒ Control
- ☐ Heating
- ☐ Hot water
- ☐ Refrigeration
- ☒ Ventilation

Installed systems

- › VRV W+ outdoor unit
- › Concealed ceiling unit
- › Branch selector box
- › Madoka wired controller

Electricity North West net zero carbon manager Daniel Shanley says: "The building was previously heated by a mix of storage and radiant heaters and an older air source heat pump system. This was relatively expensive to run – and did not guarantee optimum working comfort for colleagues based at the site.

"This innovative low carbon Daikin system was selected because, as a DNO we're taking responsibility to lead by example and to highlight this to others in the region as we strive to be more energy efficient as a key way of reaching net zero."



Daikin's R410A-based VRV W+ systems are available as single units in four sizes, ranging from 22.4kW to 40kW nominal cooling (25kW to 45kW nominal heating) and in combinations of two and three units up to a maximum nominal capacity of 120kW (cooling) and 135kW (heating).

The condensing units incorporate all the familiar VRV IV technologies with new designs to increase capacity without increasing footprint. The VRV W+ units are uniquely self-cooling – so there is zero heat dissipation and no need to cool plant areas.

Kit List

Code	Description	No of units
RWEYQ-T9	Water-cooled VRV W+outdoor unit	1
BS-Q14AV1B	Branch selector box	1
FXAQ-A	Wall mounted indoor unit	1
FXSQ-A	Concealed ceiling unit (medium ESP)	7
DCM601A51	Intelligent Touch Manager	1
BRC1H52W	Madoka wired controller (white)	5
VAM2000J	Heat recovery ventilation system	1

The new system, installed by Manchester-based Temperature Control, serves office areas on both levels with Daikin concealed ceiling units. There is also a wall mounted unit for the communications room.

Temperature Control managing director Wayne Buckley says: "The water cooled VRV W+ system is specifically designed for geothermal systems.

"Modelling data and weather data enabled us to size the equipment for peak loads and estimate peak loadings on the equipment to assist with borehole design.

"Our Daikin solution benefits from the efficiencies of the ground loop and VRV technology. Also, as it is a heat recovery system, the constant cooling demand of the server room will partly offset heating demand in the office spaces."

Further efficiency is added on the first floor with a return air plenum for the fan coil units in the ceiling. Wayne Buckley says the closed return ductwork arrangement means the ceiling void is not air conditioned to reduce energy costs.

Indoor air quality and comfort levels are enhanced by a Daikin heat recovery VAM ventilation unit in the first floor ceiling void. Unit speed is controlled by a CO₂ sensor, while the heat recovery facility minimises the thermal impact of incoming fresh air.

The Daikin systems are controlled centrally by a Daikin i-Touch Manager, with Daikin white Madoka controllers for local adjustments, if required.

