

# Application Information Sheet

## Commercial Plant Heating

### Facts at a glance:

#### Low CO2 emissions

As ground source heat pumps use renewable technology they inherently have low CO2 emissions, helping compliance with planning requirements such as the Merton Rule.

#### High efficiency at flow temperatures of 35C

COPs of 4 can be generated at a flow temperature of 35C. The heat pumps can operate up to a maximum of 50C, however at these flow temperatures the efficiencies are reduced.

#### Simple installation

Designed for simple installation allowing competent M and E contractors to install the heat pumps without specialist training.

#### Large range of units

Kensa's product range covers heating and cooling loads from 4kW to many MWs.

#### Thermal response test

For heating or cooling loads above 100kW Kensa can provide a Thermal Response Test to provide data to enable an accurate borefield design to be commissioned.

Kensa Engineering are the leading UK manufacturer of ground source heat pumps. Kensa produce a complete range of units from small domestic systems to large commercial plant, all designed specifically for the UK climate and Kensa have vast technical expertise at applying ground source heat pump technology in commercial applications.

The key to obtaining low CO2 emissions and running costs for any heat pump is to maintain the flow output at a low a temperature as possible. Any increase in outlet temperature will result in a drop of efficiency and systems should be designed to reflect this.

The following schematic details how a heating system for a commercial property can be designed.

The modular design of Kensa plantrooms enables the system to closely match the required heating load. Each unit should be configured via the BMS to operate sequentially to allow part operation to match the heat demand of the building.

The multiple unit approach also offers a degree of redundancy in the unlikely event of a problem with one if the units.

Depending on the system design it might be necessary to incorporate a buffer vessel to avoid short cycling problems and it is recommended, to improve overall efficiency of the system, that this is a twin connection buffer vessel. The vessel should be sized for 10 litres per kW of the smallest heat pump module. For example for a 60kW heating load using 3 x 20kW heat pumps the buffer vessel should be approx  $20 \times 10 = 200$  litres. (If low loss headers are used which provide sufficient volume then an additional buffer vessel might not be required).

Kensa heat pumps can work equally as well with horizontal, vertical or lake arrays as the energy source. Although Slinky ground arrays are shown on the drawing, in large commercial projects it can be more usual to use a borehole field design due to space considerations. Kensa can offer a thermal response test on a trial borehole to provide data to enable an accurate borefield design to be produced. For any loads above 100kW this is highly recommended. Please contact Kensa for further details.

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Heat Pumps

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