



## Commercial Plant Heating

[Kensa Heat Pumps](#) is 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. Kensa has vast technical expertise at applying ground source heat pump technology in commercial applications.

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

The key to obtaining low CO<sub>2</sub> 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 modular design of [Kensa Plantroom models](#) 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.

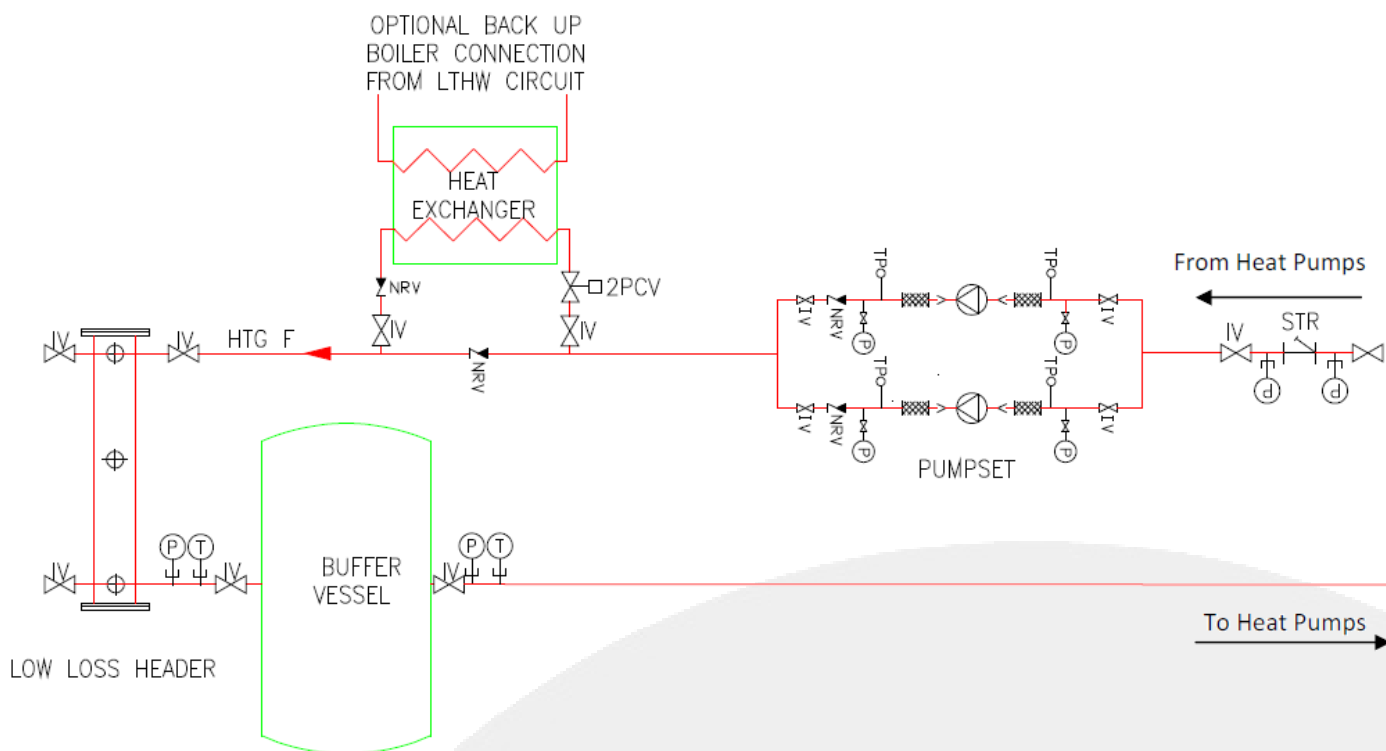
The multiple unit approach also offers a degree of redundancy in the unlikely event of a problem with one of the units. Depending on the system design it might be necessary to incorporate a [buffer vessel](#) to avoid short cycling problems— to improve overall efficiency of the system it is recommended 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 approximately 20 x 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 trail 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.

### Facts at a glance:

- **Low CO<sub>2</sub> emissions**  
As ground source heat pumps use renewable technology they inherently have low CO<sub>2</sub> emissions, helping compliance with planning requirements.
- **High efficiency at flow temperatures of 35°C**  
COPs of 4 can be generated at a flow temperature of 35°C. The heat pumps can operate up to a maximum of 50°C, however at these flow temperatures the efficiencies are reduced.
- **Simple installation**  
Designed for simple installation allowing competent M&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.

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#### Secondary Boiler Back Up Systems

For plants where a secondary back up is required this can be achieved by the use of a plate heat exchanger placed within the flow line.

By using a plate heat exchanger the two systems are hydraulically separated.

**Please note:** The attached drawings are schematics only and additional valves and fittings may be required.

**Please note:** Kensa supplies the ground source heat pumps and slinky and header manifolds. Kensa also supplies the horizontal ground arrays and antifreeze (not shown above).

#### Abbreviations

- 2PCV - 2 port control valve
- AAV - Automatic air vent
- HTG F - Heating flow
- HTG R - Heating return
- GSHP - Ground source heat pump
- IV - Isolation valve
- LTHW - Low temperature hot water
- NRV - Non return valve
- P - Pressure gauge
- PV - Purge valve
- STR - Strainer
- T - Temperature gauge
- TP - Temperature/ pressure sensor

