

### Current and Electrical Inputs in Cooling Mode

Kensa’s Technical Information Sheets quote running and electrical input powers at the conditions specified in EN14511 for 0 deg C (from the ground) and 35 deg C (flow temperature to the heating distribution system).

When a heat pump is used in cooling mode the conditions are different to those in heating mode, and therefore the current and power figures are different and therefore the current and power figures quoted in heating mode will not be the same. In cooling, the load side is usually connected to fan coils, and the standard flow and return temperatures into the chilled water system are 6 deg C flow and 12 deg C return.

The inlet temperature from the ground can vary dramatically, if the heat pump has recently been used in heating mode this can be 0 deg C (into the heat pump) all the way up to 40 deg C if the heat pump has been in cooling mode all summer. The heat pump is not designed to operate for long periods in cooling mode with ground temperatures below 15 deg C.

Due to the effect of these differing ground temperatures, the easiest way to illustrate the differing input power and running currents is by applying a correction factor to the standard heating data. The approximate correction factors are as follows:-

Temperature of water returning from the ground to the heat pump	Correction factor for either current or input power
20	0.95
25	1.00
30	1.07
35	1.15
40	1.27
45	1.42

Therefore a heat pump running in cooling mode on a standard 6/12 deg C chilled water system with a return temperature of 45 deg C would use 42% more power than the figure quoted in the standard technical information sheets where heating mode has been assumed.

#### Facts at a glance:

**Cooling systems**—Standard flow and return temperature for cooling systems are around 6 deg C flow and 12 deg C return.

**Performance**—The performance of a heat pump in cooling mode is very dependant on the ground temperature. At 45 deg C the heat pump can have a 42% increase in power consumption.

**Ground Temperatures**—These vary dramatically depending on the time of year and type of ground array used.