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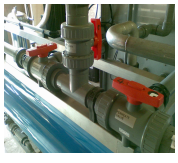
Complete Water Solutions

Heat pump sizing closed loop

Heat loss and system sizing -To achieve optimum long-term efficiency, we match the systems we install as closely as possible to the target heat load, i.e. the heat pump has to be capable of providing more heat (but not too much more) than the property will lose on the coldest of days, plus some extra capacity to take care of hot water generation. Many people feel happier with an amount of overcapacity in their heating system, however, this is seldom the best policy with ground source heat pumps and should only be considered if an extension to the area to be heated is a real and immediate possibility. Therefore, identifying the likely heat loss of a property is an important step in sizing a suitable heat pump system. The main factors involved in calculating heat loss are the materials and techniques used in the building of the property. Initially we use best-fit models to identify a suitable heat pump but where detailed plans are available or a site survey has been carried out we can derive a more accurate picture of likely heat loss. The Standard Assessment Procedure (SAP) report will be required to confirm the bespoke design for the system.

Example - The average pre 1980's 4-5 bedroom home that has good loft insulation and double glazing is likely to have an average heat loss in the order of 75W/m² (average heat loss per square metre of floor space). Such a property would be adequately served by a 17kW heat pump system. However, the same home constructed using the latest techniques and materials, may have an average heat loss as low as 40W/m² and therefore would be adequately served by an 8kW heat pump system.



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Ground Loop and trench sizes - Where space allows, we recommend the installation of Horizontal loops; they are the most cost effective and give shorter payback periods in most cases. FWT size all ground loops based on the ground being the worst possible soil type for conductivity, i.e. sands and light loams. Vertical loops, although potentially more efficient and compact in terms of surface area requirements are, more often than not, a more expensive alternative due to the drilling expense of around £3,000 per 100m hole.

Trench dimensions (Depth and width)

- Horizontal loop: up to 1metre wide x 1.5metres deep
- Slinky loop: 1metre wide x 1metre deep
- Vertical loop: Boreholes on average around 100metres deep

Example - To implement a GSHP system to suit an average pre 1980's 4-5 bedroom home that has good loft insulation and double glazing would require a 17kW heat pump. To support this arrangement, a horizontal ground loop would be installed in adjacent ground (Generally, heavier soils and clays are more favourable to ground loop installations, sands and light loams less so). In the case of clayey sub-soil, a 17kW heat pump would require 2 x 85m (or 4 x 43m) trenches.