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Main Components of an Open Loop Ground Source Heat Pump System

Along with the heat pump and ground loop a heat pump system consists of some other important components, a brief outline of them is given below:

Borehole and borehole pumping system

This pumps the ground water from approximately 60 – 100 metres below the surface. The exact components of the system will vary depending upon whether the system uses a variable speed pump controller or a fixed speed system but basically it's a pump in the borehole and control system on the surface connected into the heat pump, other water sources can also be used.

Water treatment (if required)

Sometimes the quality of water from boreholes can have a detrimental effect on heat pump components. Testing the water prior to the installation will highlight the requirement for any additional water treatment.

Heat Pump

The heart of the system that converts bulk low-grade heat from borehole water to sufficiently high-grade heat for heating purposes using similar technology to that of a domestic refrigerator or freezer.

Buffer Vessel

Optional but strongly recommended system element. Heat pumps do not like frequent starts and stops (short cycling). A suitably sized buffer vessel gives the heat pump(s) a load to drive regardless of demand from heating zones, this allows the heat pump to work at its own pace and prevents problems arising from short cycling, such as 'lock-out' due to high return water temperatures.

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Domestic Hot Water Cylinder (if required)

The type of hot water cylinder required to work most efficiently with the proposed heat source would be an indirect type cylinder featuring additional heat exchange coils (themselves being optimised for surface area and flow rate) and be extremely well insulated.