

N G Bailey-Mexborough High School, South Yorkshire.

HEAT FROM THE EARTH—GROUND SOURCE HEAT PUMP & SOLAR



Stiebel-Eltron 20KW GSHP & Schuco 3 Panel Flat Roof Installation for a large new build School.

Following a specification by engineers CAD21 we were asked by N G Bailey to price up a Ground Source Heat Pump integrated to a Solar Thermal Water Heating System for the new build School in South Yorkshire. The main contractors for this project were Norwest Holst.

After the initial enquiry and information gathering we designed a fully integrated system for the GSHP and Solar linked into one cylinder.

The specialist borehole drillers that we sub-contracted started in August and the connections for all boreholes we made and linked into a central concrete chamber ring encompassing the manifolds. From there flow and return pipes were installed underground to and from the plant room and into the heat pump. The next part of the installation was rooting the twin flexible solar pipes from the flat roof to the plant room. They then connect into a solar pump station and then into the solar coil in the cylinder.

The next part of the job was installing the heat pump with brine circuit and heating circuit and all the electrics, control items etc.

Stiebel Eltron Ground Source Heat Pump Features

- Available in five sizes of output levels
- Integral heat pump controller
- Flow temperature of up to 60 degrees +
- Extremely quiet operation
- COP of 4.5 at 35 degrees
- Perfect for under floor heating applications



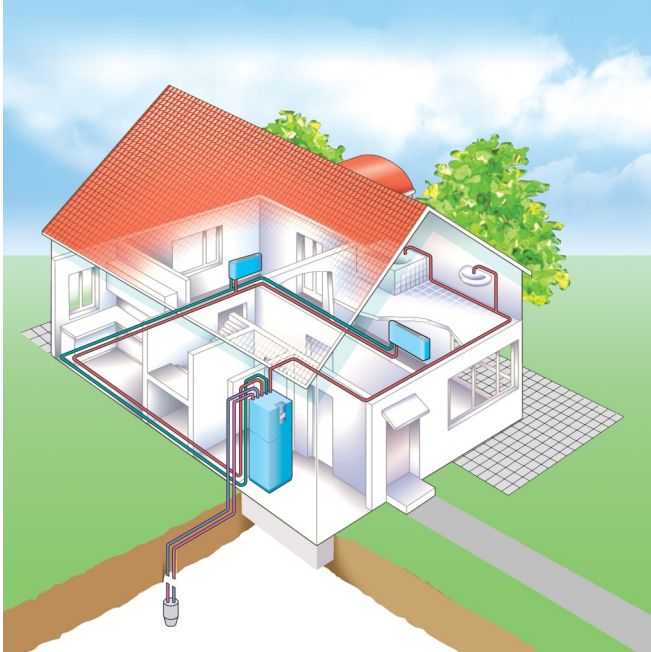
Above: showing a Stiebel-Eltron WPF20 20kW Ground Source Heat Pump installed and integrated to a DHW Cylinder heating.

On the left of the cylinder you can see the pump station for the Schuco Solar Thermal Integration.

Ground Source Heat Pump-How does it work?

The earth stores an enormous amount of solar energy from both solar radiation and rainfall. To extract this energy, ground collectors consisting of flexible poly ethylene pipes are buried in the earth, either horizontally or vertically. A mixture of water and anti-freeze is then circulated through the pipe loops, attracting the heat energy and transferring it to the heat pump.

The Ground Source Heat Pump is a 20KW Stiebel Eltron and the Geothermal pipes were laid several boreholes to take heat from the ground. The pump works like a refrigerator but it is the heat that is harnessed rather than the cooling effect. Some heat pumps can also be used in the summer for comfort cooling in a building. The heat pump then uses this energy to heat up water in the under floor heating/radiators and domestic hot water in the cylinder. As the centre is open six days a week and has a lot going on the demand for water is high.



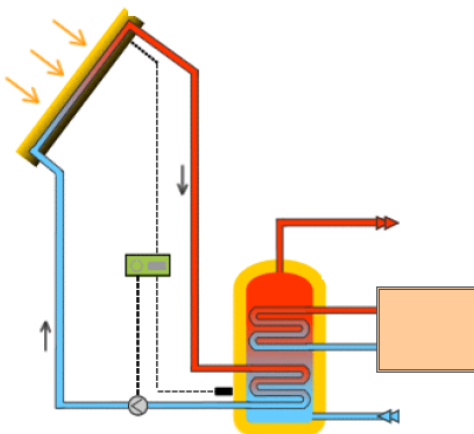
If a large enough land area is available, horizontal ground collectors provide an effective method of extracting heat from the ground. The pipework is buried at a depth of approximately 1.2m and spaced 60cm apart. The land area required is dependent on both the capacity of the heat pump and heat conductance of the soil type in which the

The Benefits!

- Reduced heating bills
- Minimal servicing required
- A perfect partner to under floor heating
- Reduced carbon emissions

Solar Thermal-How does it work?

The solar collectors on the roof transfer the heat radiation from the sun through a copper back plate and into an anti-freeze based fluid in copper pipes, which pumps through to the bottom coil in the hot water cylinder. This heats up the water in the cylinder, and switches off when the water is up to temperature. A system should provide 50 to 70% of the domestic hot water needs per year. The beauty of a solar thermal system means that your boiler doesn't need to be on in the summer for domestic water needs.



The Benefits

- Provides free hot water heating
- Extends your boiler lifespan
- Adds value to your property
- Reduces carbon emissions
- Government grant assisted

Further information