# Efficient pump performance equals increased savings

Choosing the right pump gives you optimum flexibility, efficiency and ROI says Mike Deed from Geoquip Water Solutions

Between ever-escalating energy prices and the UK government's drive towards greener, cleaner energy, the installation of geothermal heating systems is (quite literally) a hot topic.

Yes, installing a ground source heat pump system will tick the environmental boxes, but a key decision that impacts both ROI and energy efficiency is making the right choice around the type of pump to install.

All too often systems will have a green heat transfer system but fall down because the pump managing the water abstraction is simply too inefficient, requiring far too much electricity to do the job properly.

We believe the High Efficiency System (HES) pump from the Franklin Electric E-Tech brand, with the added benefit of a permanent magnet (PM) motor, provides the optimum solution – not least because it delivers energy savings of up to 21 per cent.

Available in 4in, 6in, 8in and 10in sizes for a range of installations – both commercial and domestic – the 4in size is especially suited in geothermal and/or domestic markets where there may be lower flow levels. The HES fits perfectly within open loop ground source heat pump installations, where its technology reduces the amount of parasitic energy required to run the pumping equipment.

Permanent magnet technology plays an important part in this as, instead of a short-circuit induction type rotor, the high-efficiency motor contains a PM rotor design with buried magnets. This means the windings are permanently magnetised, therefore using less energy when starting and running and, with less slip, it delivers both a smoother and faster solution.

An associated variable frequency drive and output filter also deliver greater efficiency with higher power density, while embedded software allows customers to see straight away what their payback period will be.

With ground source heat pumps requiring a major capital outlay – a typical domestic installation for an average home will cost upwards of £15,000 (US$20,000), while commercial projects are likely to be far greater, that payback period is critical.

Research shows that, with a HES installation, return on investment will be between six and 24 months, depending on variables, such as the size of the property and geological conditions.

A further advantage of fitting a system with a PM Motor is that, because it is more efficient, it can run off a lower current, something that allows the installer to potentially downsize other hardware components too.

In the unlikely event of any problems, bespoke remote monitoring and telemetry systems include triggers and alarm points and raise an alert when faults or particular combinations of problems arise. Having full remote access and round-the-clock checks in place means once a problem is identified, the monitoring team can then decide on the best approach.

And for those looking to go even higher up the environment stakes, the HES also comes with a solar-powered version – the Franklin Electric E-Tech SOLAR.

## Permanent magnet motors

Richard Knipe, from Franklin Electric, says the government's drive to encourage investment in greener heating systems combined with incentives to reach carbon zero, has created much greater interest in pumps that use a permanent magnet motor for open loop systems.

"We're seeing enquiries from smaller, private customers right up to large commercial district heating systems for anything from shopping centres to blocks of apartments and business units.

"The HES range goes from 0.55kW, which is effectively a domestic unit, right up to 250KW, suitable for large commercial projects, so customers of all shapes and sizes can benefit from the energy savings and efficiencies available."

The key, he says, is to select a pump at the right point on the curve to deliver the greatest efficiency. By then partnering this with a PM motor and variable speed drive inverter, further savings can be achieved.

Mark Aylwin, technical manager, Nicholls Boreholes, adds that installing a system with a PM motor is the secret to improved efficiency and longevity when installing an open loop heat source pump system.

"The motor is at the heart of the system and, given it is down the hole, you want something you can trust," he says. "Whenever we put in open loop systems, we always use a PM motor because longevity and efficiency are key, and by demonstrating that to the client, they can see the benefits of both saving money and gaining a longer-lasting pump."