

The heat pump revolution

The UK's first carbon dioxide-based heat pump installation is expected to herald a surge in demand as installers seize on the technology's ability to reliably heat both hot water and radiators. **Andrew Gaved** reports

The UK's first installation of Sanyo's ECO carbon dioxide-based heat pump heating system has sent rac and heating firms beating a path to the door of Oceanair Distribution, which has installed the technology at its Bristol centre.

The surge in interest from the installer community comes from the fact that unlike heat pump-based heaters which operate on HFC refrigerants, the air-to-water heat pump can heat water up to 65deg C, hot enough to be used directly in showers and baths without the need for an electric booster heater.

The system, pre-charged with the refrigerant, produces around 50 per cent less carbon emissions than comparable gas-fired boilers. Because it isn't a conventional gas boiler, it does not need to be covered an annual landlord's safety certificate, according to the manufacturer.

Richard Tyson, Oceanair managing director, said: "It is an important innovation – not only for Sanyo but for the industry as a whole, as it has major efficiency and environmental advantages over the traditional gas-fired boiler."

Mr Tyson said the potential of the heat pump technology would spell an opportunity for the rac sector: "It opens up a major new market for refrigeration and air conditioning engineers, and we will be supporting them every step of the way."

At the heart of the system is Sanyo's two-stage rotary compressor, claimed to be the world's first operating on R744 and able to operate at ambient temperatures a low as -25degC.

The inverter-controlled direct current unit delivers COPs of up to 3.75 with the two-stage compressor enabling safe load dispersion and thus able to accommodate the high working pressures generated by carbon dioxide. The system is fully welded to virtually eliminate the risk of leaks, Sanyo said.

Automatic adjustment

The system consists of an outdoor heat pump unit linked to an indoor unit containing a heat exchanger and hot water tank. The hot water can either be supplied as running water or directly connected up to radiators or an underfloor heating system, with the ECO's control system able to simultaneously deliver the water at different temperatures for different uses. It also automatically adjusts the water temperature according to the outdoor temperature, so as the external temperature drops, the heating inside the premises increases.

Significantly for the heating sector, Sanyo's system requires only water and electrical connection and is compatible with existing radiators and under floor systems, so can be used as a direct replacement for ageing boiler installations. It can also be linked to other energy sources, such as solar heating.

Mr Tyson says: "With energy costs rising and pressure to reduce carbon emissions increasing, we believe that this is a technology whose time has come. The Sanyo system transforms the efficiency of domestic and small commercial heating systems, and beats conventional gas boiler technology hands down. I have no doubt



Richard Tyson, Oceanair managing director, is full of praise for the new system

it will have a major impact on the market, and presents the industry with an exciting new sector to develop."

The development of a product that can reliably heat water to 65 degrees is seen as a turning point by Sanyo. Business Planning Manager Bob Cowlard said: "The ability to retrofit into the existing radiators is a real turning point, since it provides a real efficient alternative to the conventional boiler for refurbishment projects, with the added advantage that all you have in the house is water, so there are no problems with the risk of carbon monoxide."

Mr Cowlard added "It also performs better at lower temperatures than a HFC based heat pump and doesn't require booster heating for the water. Although it costs more, the lifetime costs really add up."

Industry expectations are that Sanyo will bring out a bigger CO2 heat pump at some point next year, as well as looking at connectability between units, in a bid to target heating and cooling for larger commercial applications.

The development of CO2 and HFC heat pumps could potentially have a huge impact on the UK heating and cooling market. The UK volume is expected to be around 10,000 this year, but many believe it will reach similar levels to France, where volumes top 125,000/