

# Adding heat pump to meet the Code

With house builders now having to comply with level three of the Code for Sustainable Homes for at least a portion of their newbuild developments, installers working in the newbuild sector are no doubt being relied on to recommend energy-efficient, low-carbon heating and hot water solutions.

In line with Part L1A, each new proposed property in the UK will have a Target CO<sub>2</sub> Emission Rate (TER) and, to be able to build, the Dwelling CO<sub>2</sub> Emission Rate (DER) must be the same or lower than the target.

However, since April 2008, all newbuild social housing schemes have needed to meet level three of the Code for Sustainable Homes, which calls for a 25% reduction on the Part L1A DER over the TER.

This doesn't just affect housing associations or local authorities either, as 20% of any new private housing development has to be dedicated to social housing.

Furthermore, it is also thought that the 2010 revisions to the Building Regulations will



The Elson Coral E cylinder

**Clyde Brown, managing director of HWA member Elson Hot Water, takes a look at the Code for Sustainable Homes**

closely mirror level three of the Code for Sustainable Homes.

This means that installers working on newbuild projects are increasingly likely to be installing heating and hot water products that produce minimum carbon emissions – and they could also be tasked with making recommendations.

The good news is that recent calculations have revealed that level three and above of the code can be met with an air source heat pump and a thermal store (calculations based on a three-bedroom semi-detached house, according to SAP 2005, Standard Assessment Procedure).

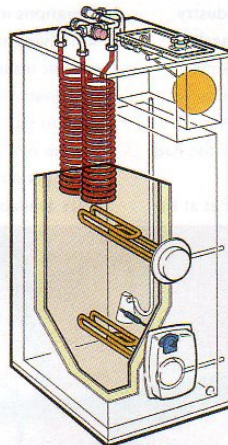
Air source heat pumps are a very efficient heating solution. They extract heat from the outside air and, using electricity, upgrade it to a higher, more useful temperature via a heat exchanger.

If designed and installed correctly, a heat pump can deliver between 3 and 4kW of heat for every 1kW of electrical energy used, thereby reducing carbon emissions as well as fuel costs for the homeowner.

Air source heat pumps can be used for space heating, employing underfloor heating or radiators with a large surface area, as well as water heating when coupled with a hot water storage cylinder.

For hot water storage, various

options are available, but choosing a thermal store enables a house builder to reach level three of the Code for Sustainable Homes with ease –



The inside configuration of the Elson Coral E cylinder

using the same calculations as earlier. It actually gets quite close to level four – which could be met if some other carbon-saving measures were implemented, for example improved fabric insulation, improved air tightness and low-energy lighting.

The thermal store offers a very similar end result to unvented water heating – namely powerful showers and fast filling baths – but uses a traditional vented system.

The principal of a thermal store is significantly different from a traditional domestic hot water storage system – whether vented or unvented. Whereas in a traditional system the water that is stored in the cylinder is the same water that is emitted through the taps, in a thermal store, the water within the tank remains static and is used as the energy source for heating the mains incoming water, instantaneously, via a very efficient coil located within the thermal store.

One of the main benefits of a thermal store is that it actually uses traditional vented system technology for the storage aspect.

This means that only traditional plumbing skills are needed for an installation, and because there is no need to incorporate devices to prevent over-pressurisation at high temperature, the worst case scenario is that an overflow pipe from the cistern will need to be installed.

Even this can be overcome by the installation of a manual-fill kit, which makes the thermal store a completely stand-alone unit, and therefore increases the options of where the unit can be sited.

A thermal store can be heated either indirectly, using a primary coil connected to a heating system – in a similar way to a traditional indirect hot water storage system – or directly, using electric immersion heaters.

When used in conjunction with an air source heat pump, the thermal store can be heated indirectly, using a primary coil connected to the heat pump.

Where necessary, an immersion heater will boost the temperature of the hot water, for end-user comfort and thermal disinfection.

For added efficiency, a buffer tank can be used, where any excess energy that is produced during the most efficient times can be stored for later use.

When tasked with meeting the requirements of the Code for Sustainable Homes, air source heat pumps offer an appropriate heating solution.

Also, to provide water heating as well as space heating, air source heat pumps need to be coupled with a storage cylinder, and using a thermal store means codes three and possibly four can still be achieved with minor upgrades to other build elements.

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