



## Heat Pumps

### Details Required

#### **Type of heat pump you intend to use**

Most people choose to install an air source heat pump (ASHP) because they're the easiest and quickest to install. A ground source heat pump (GSHP) will need either a lot of ground for trenches into which horizontal collector pipes are installed, or boreholes to be drilled for vertical collectors. The latter method is marginally more efficient than horizontal collectors, but is substantially more expensive, and it is unlikely that the additional cost is balanced by the additional benefit in efficiency.

#### **Plan of your plot - if ground source**

If intending to install horizontal collector pipes for a GSHP, a plan of your plot will allow us to estimate if there is enough room for the amount of collector pipe required. As a rough guide, you would need an area of ground at least two times the size of the total floor area of your property.

This will also give us an idea of the best location for an ASHP, if you choose this option.

#### **Floor plan for each floor**

The floor plans will show us how the rooms are laid out, and potential locations for the equipment.

#### **Elevation drawings**

Elevation drawings show the positions and sizes of windows and doors, which enable us to calculate the heat loss of the building, and thereby size the heat pump accurately.

#### **U-value information for the external walls, floors, windows, doors, and roof**

It's all about insulation, as you'll read in our [blog](#). Again, this is important information for calculating the heat loss of the building.

### **General**

- Location of your project.
- Your name, current postal address, and telephone number.
- Planning application number, if possible.

### Comparing Quotes

#### **MCS registration**

We are MCS accredited in our own right. We do not rely on a third party to perform the calculations required by MCS, which make you eligible to claim the appropriate grant. Being MCS accredited means that our installation and admin procedures are annually audited by an independent organisation to which we pay an annual subscription. They ensure that we comply with the MCS Standards. This means that we provide you with the best possible service and attention to detail.

Use the Energy Saving Trust's [Renewables Installer Finder](#) to check that other installation company being considered are MCS accredited in their own right for the installation of heat pumps. (They may be MCS accredited in their own right for other technologies, but not heat pumps.) The MCS calculation reports the other company send with their estimate may show the heat pump manufacturer's name, but this does not necessarily mean that your installer is MCS accredited.

Check that the other company has not used an assumed figure to calculate the size of heat pump. It is OK to do so for a provisional estimate for budgetary purposes, but unless a company has performed room by room heat loss calculations, you may be quoted for an incorrectly sized heat pump.

### **Heat pump specified**

Not all heat pumps are the same; some have better performance characteristics than others. The heat pumps we specify automatically vary their output depending on how much heat is required to account for the heat loss at any time. There are heat pumps that don't do this, and if the heat pump specified by others does not vary its output you could be using more electricity than necessary. When sending our estimate we will provide manufacturer's information about the heat pump specified.

- Check the characteristics of the heat pump specified by the other company by visiting the manufacturer's web site and searching for technical specifications and compare these with the details we sent.

### **Outside temperature**

Since the introduction of more efficient heat pumps, we now calculate all of our heat pump estimates using an outside air temperature of -5°C.

- Check the outside temperature the other company has used in their calculations.

### **Water supply temperature**

Because heat pumps work at their most efficient when providing water heated to 30 - 35°C, we perform our MCS calculations using 35°C flow temperature. This gives your heating system the maximum energy efficiency rating of 6 stars. One star is deducted for every 5°C added to the water temperature required, i.e. 40°C = 5 stars, 45°C = 4 stars, etc. This is because when running at temperatures higher than 35°C, heat pumps become less efficient, and their Seasonal Co-efficient of Performance (SCoP) reduces. The star rating is based on the space heating flow water temperature. The domestic hot water would be designed at 50 - 55°C, but this would normally need to be boosted to 60°C for 2 hours per fortnight for legionella protection. This is most often achieved by an immersion in the hot water cylinder, but some recently introduced heat pumps can achieve this without use of an immersion. The DHW water temperature does not have a bearing on the system's energy efficiency star rating.

- Check that the other company has used 35°C as the water flow temperature for space heating.
- If you're having underfloor heating, check that the other company will be using appropriate pipe spacing for a 35°C flow water temperature.

### **DHW cylinder**

The hot water cylinder should be sized according to the potential occupancy of the house. If you have a 5-bedroomed house with 3 bathrooms, but there are only two of you, the hot water cylinder should first be large enough to cater for the average occupancy of a 5-bedroomed house, and second should work with the size of heat pump required. In this scenario, a 250 - 300 litre cylinder would be required even though there may only be two occupants.

The surface area of the heat pump coil in the cylinder is vital to ensure that the heat pump can deliver as much heat as possible to the cylinder to heat the water.

The hot water will need to be boosted to 60 deg C for two hours per fortnight to protect you from legionella. Most heat pumps do this via an immersion heater in the cylinder, but it only tops the temperature up from whatever is already in the cylinder, not from zero. If the water in the cylinder is already 50 deg C, the immersion heater will only have to top up the last 10 deg C. Because today's DHW cylinders are well insulated, they don't lose much heat to the atmosphere, only when you open a hot tap.

- Check the size of DHW cylinder, the heat pump coil surface area, and the water temperature the other company has specified.

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### **Buffer cylinder**

Some heat pumps specify the need for a buffer cylinder. This is primarily to use as a heat dump in order to reduce short cycling which can shorten compressor life. The new generation of heat pumps using modern inverter compressor technology eliminates the need for a buffer. The installation of a buffer might be beneficial if you have solar PV panels or another means of generating your own electricity and you can utilise your electricity generation to pre-charge a buffer. The size of buffer cylinder is dependent on the size of the heat pump and the hydraulic arrangement of your heating system.

- Check the size of buffer cylinder the other company has specified, if included.

### **MVHR/DCMVHR?**

Forthcoming changes to building regulations as these relate to ventilation, will require that ventilation be considered along with energy efficiency. It will no longer be acceptable to include trickle vents above windows as a means of ventilation. Without proper ventilation there is the potential risk of sick building syndrome and a risk to the health of the occupants due to the build up of stale air. It would be counter-productive to open windows in order to provide adequate ventilation when you've spent good money on an energy efficient heating system and let your valuable heat out.

If installing a ventilation system with heat recovery, this may reduce the size of heat pump required because the heat recovery function pre-heats the incoming air using heat extracted from rooms like bathrooms, kitchens, and anywhere there is a wood burning stove, for example. The re-cycled heat covers some of the load that the heat pump would otherwise have to provide.

- Check if the other company has made an allowance for you having MVHR contributing to your space heating.

### **GSHP collector/s**

If using horizontal collector pipes, we will include an allowance for laying the ground collector pipes in the trenches. If opting for borehole collectors, these are installed by specialist drilling companies, but we will include for laying the connecting pipe between the boreholes and the heat pump indoors.

- Check that the other company has included the collectors and the labour for installing them.

### **Completion materials**

We always give an estimated figure for the materials required to connect between the heat pump, the DHW cylinder, and your heating system, and will provide a list of the components used, and their prices, when we send our completion invoice. The estimated figures we give in the estimate is based on our experience of previous installations.

- Check that the other company has included realistic costs for these materials or you might be issued with a substantial unexpected invoice when the work is complete. Other companies may expect the connections between the DHW cylinder and your heating system to be carried out by your domestic plumber.