**HEAT LOSS**

The heat loss calculation is a fundamental aspect of sizing the correct heat pump for a property or building.

The heat loss provides a clear gateway to the amount of energy the property or building requires against the materials that make up the fabric of the property or building this is known as fabric loss per Hour.

The heat loss also considers the age of the property and air changes that each room or area would be expected to achieve in a 1 Hour period  this is known as ventilated losses.

The accumulated information allows a calculated measure of the amount of energy and power the property or building would need against the outside temperature differential to the inside target temperature i.e. Outside -3.5°C inside target 21°C a 24.5°C temperature difference.

The heat loss calculation would allow the correct sized heat pump to be selected to achieve as an example the target suggested above.

The heat loss from the size of the heat pump selected allows the running costs to be calculated for the generation of space heating and hot water production for the property or building.

The heat Loss expands the information revealed to allow for the correct room by room heat loss which allows the correct sizing of heat emitters such as radiators or underfloor heating using the designed flow temperature in order to allow the calculations needed to match the emitters at the design flow temperature to the correct radiator or underfloor design.

Our heat loss calculations are based on MCS standards and Cibse design guide which are recognised under the British standard EN 12831 ensuring accurate reports for all types of properties and building of any age or construction.

**HYDRONIC DESIGN**

With aid of a comprehensive heat loss report informing of the size of heat pump required and the design flow temperatures selected, the secret of a successful heat pump system is high source with a low sink

* Source being the air temperature around the heat pump.
* Sink being the heating system internally.

The next stage is to recognise the symbiosis of the power from the heat pump being correctly distributed around the selected emitters (Radiators and of Underfloor Heating).

The hydronic design allows the pipework system to be correctly sized between the relevant points of the system and considers the volume of flow required, the speed at which the flow must be transported and the difference in temperature between the flow pipe delivering to the emitters and the return pipe to the heat pump. The factors being

* The loss in pressure through resistance in the pipe work system (this is the speed aspect)
* The size of the pipes needed at each delivery aspect (this carries the volume aspect)
* The sizing of the circulation pump (this manages the difference in the flow and return temperatures)

The hydronic design then allows a detailed system design sizing all aspects, radiators, pipes, valves and pumps.

Our hydronic design allows for the materials inventory and detailed instruction for installation to allow best practice design for performance and efficiency once correctly commissioned, for the following

* Copper pipeworks or MLCP
* Radiators / Underfloor heating / fan coil units
* Heat pumps / ASHP / GSHP (client model preference catered for)
* Fossil systems all types
* Hybrid based combinations

**ELECTRICAL DESIGN**

The system will require a detailed electrical design to allow simplicity of installation by the selected electrician along with set up instruction.

The control becomes the next part of the relationship.

 **Heat Loss / Hydronic Design / Control**

Control systems allow the information from the property or building to the heat pump to be correctly interpreted allowing the speed, volume and the temperature differential to be accounted against the next important aspect the temperature of flow against the temperature outside and the difference needed to achieve the target internal temperature, going back to high source low sink principle using a control strategy  called advanced weather compensation as the outside temperature rises (Source) the difference drops between the outside temperature and the internal target so the control strategy lowers the flow temperature allowing the theory to practice maximising system efficiency and minimum running costs.

We can provide the required electrical schematics and set up detail

Applications for the permission to connect to the District Network (Grid)

**SOUND PRESSURE CALCULATION**

Permission to install a heat pump has a bearing on the sound pressure of the compressor and fan on neighbouring properties and must achieve 42DBa or less.

For ASHPs less than 0.6CMts in volume, if the sound pressure test passes and the location meets acceptable standards then the installation is permissible.

(Less than 42DBa from the nearest opening in a habitable space of the nearest neighbouring property)

However, if the test fails then planning consent must be sought from the controlling authority.

Heat pumps above 0.6CMts will require both the sound pressure test and local planning consent.

Siting of heat pumps can vary from authority to authority and local conditions must be checked.

We can provide the soundness reports and assist with planning applications.