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The Noise impacts from Air Source Heat Pumps (ASHP)

Air Source Heat Pumps use basic thermodynamic principles to convert latent/sensible heat (contained within the ambient air) into heat energy that can be used to provide heating and hot water. In this respect the device can be classified as a renewable energy source because the heat in the ambient air is replenished by the sun.



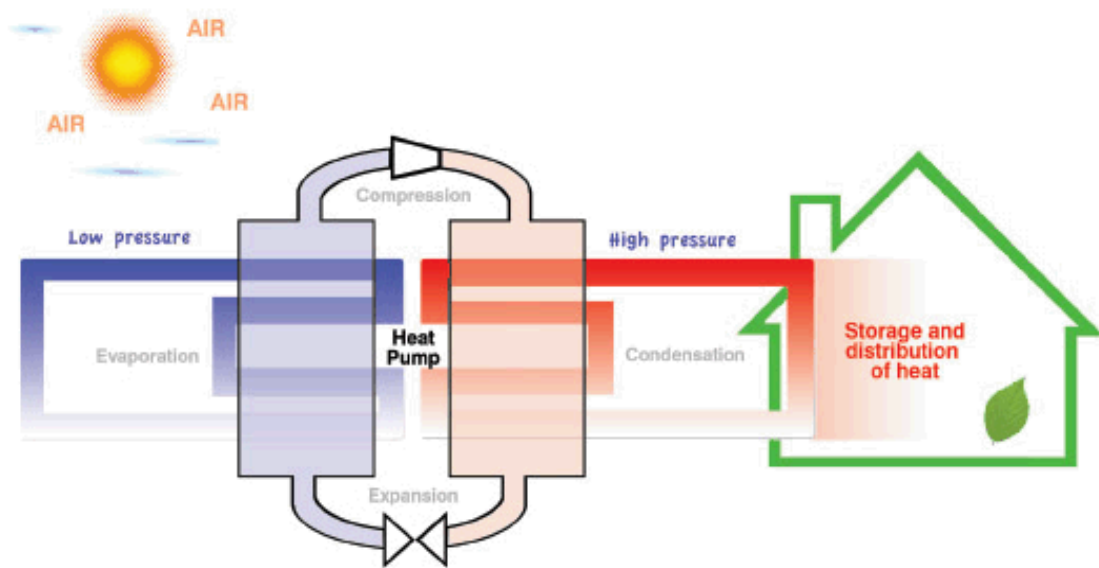
Ref; <http://www.thefueleffect.co.uk/>

ASHP Technology

There are two types of ASHP, 'air to air' and 'air to water'. Air to air heat pumps release the captured energy through an air heat exchanger, which is then forced (by fan) around the dwelling through trunking or directly into the room. Most commercial buildings use this type of heating medium. Air to water heat pumps release the energy into a water circuit which is then used in a wet heating system (radiators or under floor).

Vapour/Compression Cycle

Air to water heat pumps employ the dynamics of the vapour/compression cycle used for many years in the basic refrigeration process found within a domestic fridge. A low pressure, low boiling point liquid (refrigerant) is exposed to a higher temperature in the coil of the evaporator. The vapour boils off to a gas and in doing so, absorbs energy. The refrigerant gas is then compressed to a higher pressure and temperature before passing through a heat exchanger where it gives its heat energy to water. The heated water is then delivered to a cylinder or heating system. After passing through the heat exchanger the refrigerant condenses back into a liquid before starting the process again.



Noise Impacts of ASHP

Heat pumps incorporate a fan and compressor that will generate a degree of background noise under normal operation. As it is generally accepted that ASHP's are located near to the property's exterior walls for ease of pipe and power cable runs, it is important that consideration is given to the amount of noise generated. Noise is measured in decibels or dB(A) and gives an indication of sound pressure level, usually measured at a distance of one meter. The (A) refers to the A weighting added to the sound to mimic the human ear.

Ref: <http://www.grantuk.com/products/heat-pumps/>

Air Source heat pumps can produce relatively high levels of noise (dB decibels) which can cause noise nuisance to neighbouring property. The dominant frequencies within the noise can be low i.e. 50 – 200 Hertz (Hz) which travels further, can enter buildings and be heard as an annoying hum particularly through the night.

Care needs to be taken in placing of units so as to reduce the likelihood of complaints and Health Protection recommend the applicant arranges for a competent noise consultant to carry out a noise survey and advise on suitable locations.

Planning Aspects:

When a planning application is received by the Planning Department, which proposes a proposed air source heat pump, Planning will consult with Environmental Health. When this request is received, Environmental Health officers would normally visit the site to determine whether there may be any noise issues.

All planning applications are determined on the basis of information submitted within the application and thus applications may not be supported if a noise survey is not provided with the submission to enable a full assessment of the potential for noise issues. If the noise survey concludes that there may be noise issues, acoustic treatments and measures can be incorporated into the proposal and submitted for assessment at the time of the planning application.

This highlights the importance of good pre-application advice. Please contact Environmental Health on 445808 for more information. Environmental Health has produced a pre-application leaflet and guidance to Noise consultants on the information required in a noise survey. This is available at:

<http://www.gov.je/Home/Parish/Nuisances/Pages/NoisePollution.aspx>

For useful info on air-source heat pumps look at:

<http://oee.nrcan.gc.ca/publications/residential/heating-heat-pump/7081>

<http://www.nihe.gov.uk/> and search for air source heat pumps

<http://www.bsria.co.uk/news/air-source-heat-pumps/>