



Briefing Note

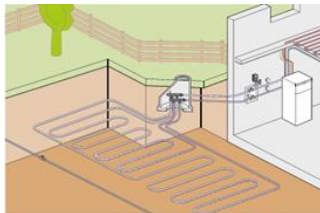
Heat Pumps

Heat pumps are part of the Government's strategy to reach net zero carbon emissions by 2050. However, the technology generates noise, and it can operate during the night and day. As a result, it has the potential to cause significant adverse effects to people living nearby. This briefing note provides guidance for those thinking about purchasing a heat pump in order to avoid significant adverse noise impacts associated with their use. More detailed information for installers is in our practitioners note [here](#).

Aims:

- Set out advice to enable the use of heat pumps (HP) as a source of low carbon heating and cooling, whilst minimising the risks of sound and vibration from the units causing significant adverse impacts or statutory nuisance.
- Outline the expectations for mitigation to minimise impacts as far as reasonably practicable, to protect amenity and quality of life and the quality of the existing acoustic environment.

Permitted Development (PD) rights allow Microgeneration Certification Scheme (MCS)¹ approved HP installations without the need for planning consent. It is important to check with the local planning authority (LPA) that an installation is considered to be PD². However, there may be regional variations in PD rights. Furthermore, adherence to the MCS scheme alone may not avoid the creation of significant adverse impacts from noise and vibration. This is because there are a number of factors that can increase the potential for disturbance that are not fully covered in the MCS Scheme³, including:



Ground Source Heat Pump (GSHP)

- Tonality
- Intermittency of operation
- Sound levels in reverse cycle
- Low background sound levels
- Structure borne sound and vibration transmission



Air Source Heat Pump (ASHP)

A heat pump works like a fridge but in reverse. For an ASHP, the main sources of noise are the fans and compressor. GSHPs often have pumps and compressors located inside a building, with a resultant risk of noise being transmitted through the structure.

Considerations

Whilst initial considerations regarding HPs are likely to focus on the purchase/running costs and its operating efficiency, the potential implications of noise and vibration should not be ignored. Advance planning can help avoid potentially costly problems for occupiers and neighbours. Resolving noise issues post-installation can be expensive and disruptive to the person responsible (as there can be

¹ Microgeneration Certification Scheme: <https://mcscertified.com/wp-content/uploads/2021/10/MCS-020.pdf>

² There is a difference in PD rights between nations of the UK, although the MCS method is the same.

³ The MCS scheme was designed to be relatively straightforward for ease of implementation and therefore could not cover all these issues.



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implications for the whole heating system) and can strain relationships with neighbours or others in the same household.

Do's and Don'ts when considering Heat Pumps



Source: Do carefully select the unit to minimise sound levels and avoid pronounced acoustic features such as tones.

Location: Do locate the unit as far away as possible from neighbouring premises and especially away from openable windows to noise sensitive rooms such as living rooms or bedrooms.

Position: Do place on facades that are already exposed to noise wherever possible (i.e., roadside).⁴

Screening: Do screen the unit so your neighbours do not have a line of sight to it (note 1).

Installers: Do use reputable installers (e.g. MCS Scheme) (Note 3).



Location: Don't locate in quieter locations, or near sensitive amenity spaces.

Position: Don't mount the unit on a wall or roof (note 2), especially if they are shared.

Note 1: Screening can be provided by existing structures such as a garden wall or fence. To be effective, the screen must have no gaps or holes in it and be of a material with at least 10kg/m² surface density (similar in weight to 18mm plywood). Hedges are not acoustic screening. As well as using existing structures, noise can be mitigated using purpose built acoustic enclosures. Care needs to be taken however, so that any enclosures are carefully engineered as they can affect the thermal output. Furthermore, they are not always as effective as claimed.

Note 2: There will be exceptions, for example, in urban areas where walls and roof space may be the only realistic option for locating an ASHP. In such instances, it is recommended that specialist advice is sought to assess and mitigate any sound transfer to windows and doors of nearby habitable rooms and external amenity spaces.

Note 3: The maximum operational sound level can be calculated. Advice on alternative criteria and calculation methodology is provided in our Professional Advice Note for practitioners ([click here](#)).

Note 4: When this note refers to the specific level of sound, it is describing the sound level produced by the unit alone as measured at a defined distance.

⁴ Having said that, the current MCS scheme discourages this good practice



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Summary

- It is recognised that heat pumps are part of the Government's drive towards net zero carbon emissions by 2050. This Briefing Note is offered to assist this transition towards a more sustainable future by addressing potential noise issues that might otherwise hinder this process.
- Prevention is better than cure. Noise and vibration impacts should be considered in advance of installation. Taking a precautionary approach is advised.
- The owner should take all reasonable steps by:
 - selecting units for quiet operation - units vary even for similar energy efficiency / cost.
 - using certified installers.
- For Permitted Developments - installers should provide an MCS noise assessment. Having said that, it does not allow for tonality or include vibration, and is no guarantee of avoiding significant adverse noise impacts.
- Check with LPA if a proposed installation is PD or not. If not, a noise impact assessment completed by a Suitably Qualified Acoustician (SQA),⁵ will probably be necessary to support a planning application to the LPA. This may avoid planning issues arising and subsequent significant adverse noise impacts occurring.
- Any assessment approach should be informed by, and proportionate to, the local circumstances and the degree of risk of a significant adverse noise impact occurring.
- Cumulative impacts that may result from multiple installations over time should be taken into account.

For more information please email: Briefings@ioa.org.uk

The Institute of Acoustics (IOA) is the UK's professional body for those working in the field of acoustics, sound and noise management. Its 3,000 members include consultants, academics and regulators and its activities include working for the building industry, developers and local authorities in all matters associated with sound and noise management in the built and natural environment. www.ioa.org.uk.

The Chartered Institute of Environmental Health (CIEH) is the professional voice for environmental health representing over 7,000 members, working in the public, private and third sectors, in 52 countries around the world. It ensures the highest standards of professional competence in its members, in the belief that through environmental health action people's health can be improved. <https://www.cieh.org/>

About this Good Practice Note

This note was produced by a joint working group of noise specialists, representing members of the Institute of Acoustics and the Chartered Institute of Environmental Health, including:

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A link to the Professional Advice version of this note is found [here](#).

⁵ A Suitable Qualified Acoustician (SQA) is a Corporate Member of the Institute of Acoustics with at least 3 years' relevant experience or an Environmental Health Practitioner with at least 3 years of experience of noise assessment and management, and supporting qualifications.