

# Heat Pumps: Avoiding Noise Nuisances



# Incorrectly installed heat pumps can cause sleep and amenity disturbance. This brochure provides simple advice to owners and installers of heat pumps on how to prevent a noise nuisance.

## Noise Rules

Section 16 of the Resource Management Act 1991 makes every occupier of land responsible for adopting the best practicable option to limit noise emissions from their property to a reasonable level.

The Auckland Unitary Plan sets out noise limits for different areas of Auckland, based on the zoning of a property. There are different levels depending on the time of day. These limits are used to identify a reasonable level for noise emissions from heating and ventilation equipment. You can find out the zoning of your property and the relevant noise limits by visiting the Auckland Council website, or by contacting the Auckland Council call centre on **09 301 0101**.

While the Auckland Unitary Plan should be used to precisely determine the reasonable level of noise for a particular zone, indicative noise limits for properties located in residential zones are provided in the below table;

**Table E25.6.2.1 Noise levels in residential zones**

Time	Noise level
Monday-Saturday 7am-10pm	50 dB $L_{Aeq}$
Sunday 9am-6pm	
All other times	40 dB $L_{Aeq}$ 75 dB $L_{AFmax}$

The Auckland Unitary Plan noise limits are measured in dBA ( **$L_{Aeq}$  and  $L_{AFmax}$** ) which is a sound pressure level with a frequency weighting that more closely approximates the response of the human ear to sound. The  $L_{Aeq}$  level is a time averaged level, measured over a certain period of time. The  $L_{AFmax}$  is the maximum permitted noise level. Noise will normally be measured at or within the boundary of a property not on the same site as the noise source.

When responding to a heat pump noise complaint, Council Officers will measure the noise levels to determine if it is necessary to reduce noise emissions to ensure a reasonable level of noise is achieved. A failure to comply with the Auckland Unitary Plan noise limits may result in enforcement action being taken in accordance with the Resource Management Act 1991.

Section 16 of the Resource Management Act 1991 makes every occupier of land responsible for adopting the best practicable option to limit noise emissions from their property to a reasonable level.

## Maintenance of heat pumps

Tonal type sounds, or sounds with a narrow frequency range, are common from rotating parts in units, such as fans and motors. These noises can greatly increase if you do not maintain your heat pump regularly to replace worn bearings or limited life parts before they fail. Loose screws in a metal casing are a common source of buzzing or rattling noises. When you have your pump installed, ask the installer to provide you with an appropriate maintenance schedule

## Sound insulation methods

In urban areas there may not be enough space between residences for exterior heat pump units to be installed without causing noise problems.

Noise may be directly transmitted to a neighbour's house wall, or indirectly from reflection off the wall of the house being heated, or a combination of both. Higher frequency sounds are readily reduced by structure, but lower frequency sounds may penetrate structures unless they are reduced at the source. If you are unable to locate the unit away from the vicinity of neighbour's rooms, some degree of noise control is usually necessary.

Conceptually, a soundproof enclosure should provide a noise reduction of at least 5 decibels. If it is well constructed, you can be reasonably sure of a 10 decibel reduction, and you may be able to achieve a 15 to 20 decibel reduction.

## Selecting Heat Pumps

Manufacturers, installers and retailers have a community obligation to provide responsible advice and service to prevent noise nuisance. Ask your installer for advice on the most appropriate size of unit to install for the area to be heated.

Select the pump that is most suitable to prevent excessive operation times or load on the unit. Choose a heat pump with a low sound power level. The exterior sound power level will be specified on the side of the unit and will give you an indication on how noisy the heat pump will be outside your house. The higher the number the louder the heat pump unit will be. Note the sound power level is different from the sound pressure level.

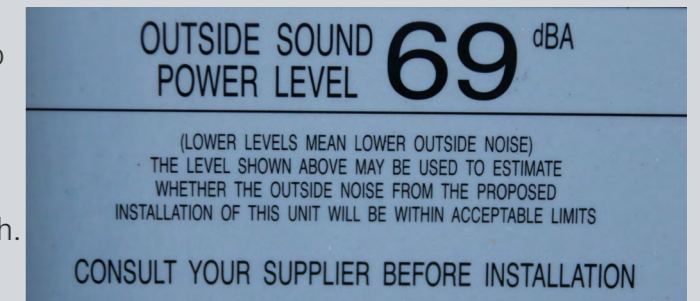
## Siting Heat Pumps

The main reason for noise complaints is the inappropriate location of heat pumps close to, and facing, neighbouring bedrooms and living areas. When installing a heat pump, you should first consider the effects noise from the unit may have on yourself and your neighbours.

Heat pumps should be located as far as possible from your and your neighbour's bedroom, and never with the fan facing directly towards the windows of a neighbouring residence, particularly habitable rooms and outdoor living areas. The fan unit should face the boundary of the property furthest away from the adjoining residences, not towards windows or outdoor living areas of a neighbouring residence. Try to avoid mounting the pump on a wall and in particular at a high level, as this can result in unimpeded transmission of noise to neighbouring properties. If possible, mount the heat pump at ground level and on a solid base, preferably a concrete pad or block. Use rubber pads between the unit and the base to eliminate vibration.

Ensure that where refrigeration lines pass through walls, they have adequate clearance and insulation. Vibration from within walls can magnify noise levels beyond acceptable levels.

Make use of fences and walls between you and your neighbour's home as these can help reduce the transmission of noise. If a nuisance eventuates, you may need to investigate other options such as acoustic barriers or acoustic treatment.



For more information visit our website

**[aucklandcouncil.govt.nz](https://aucklandcouncil.govt.nz)**

Get in touch with the Compliance Response Noise Team

Phone: **09 301 0101**

Email: **[Enquiry@aucklandcouncil.govt.nz](mailto:Enquiry@aucklandcouncil.govt.nz)**

