

# Neighbourly installation of Heat Pumps



With the increasing number of heat pumps being installed in Dunedin, there has been a corresponding increase in the number of noise complaints about the units. If installed inappropriately, they can cause sleep and amenity disturbance.

This pamphlet provides simple advice to owners and installers of heat pumps on how to prevent a noise nuisance.

## Siting heat pumps

Noise complaints are mainly due to the inappropriate location of heat pumps close to, and facing, neighbouring bedrooms and living areas. Before installing a heat pump you should consider the effects noise from the unit may have on yourself and your neighbours.

- Heat pumps should be as far away from your own and your neighbours' bedrooms as possible. 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 other options such as acoustic barriers or acoustic treatment.

## Selecting a heat pump

Installers and retailers have a community obligation to provide responsible advice and service to prevent noise nuisance.

Discuss noise issues with your installer before the heat pump is installed. Ask for advice on the most appropriate size of unit 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. The sound power level is different from the sound pressure 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

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. We have a detailed handout called 'Heat Pumps and Noise Reduction' that describes some of the principles of noise control that can be employed to reduce noise from the heat pumps.

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.

## Noise rules

Generally noise is measured at or within the boundary of any dwelling not on the same site. We will respond to noise complaints and determine if it is necessary to reduce noise emissions to ensure a reasonable level of noise is achieved. A failure to comply with Section 16 of the Resource Management Act 1991 may result in enforcement action being taken in accordance with the Resource Management Act 1991.

## 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.

## Dunedin City District Plan

The District Plan contains noise maps that identify appropriate noise limits for different areas of the city during different times of the day. These limits are used to identify a reasonable level for noise emissions from heating and ventilation equipment.

The District Plan noise limits are measured in dBA (L10), which is a sound pressure level with a frequency weighting that more closely approximates the response of the human ear to sound.

While District Plan maps should be used to precisely determine the reasonable level of noise for an area, indicative noise limits are provided in the table below:

		Time of day		
		Day-time 7.00am to 9.00pm	Night-time 9.00pm to 7.00am 24 hours on Sundays & Statutory Holidays	Shoulder period 7.00am to 8.00am Monday to Friday 6.00pm to 9.00pm Monday to Saturday
City Area	Inner Suburbs	50 or 55 dba	40 dba	45 dba
	Outer Suburbs	50 dba	35 dba	45 dba
	City Centre	60 dba	60 dba	n/a
	Rural	55 dba	40 dba	n/a

\* Penalty upward adjust 5dba