City of Cockburn | Public Health Service

Owners Guide to Installing Domestic Air Conditioners

As we use more air conditioners in our homes and our houses become larger and are closer together, residential air conditioners are making a significant contribution to the increasing level of environmental noise in our communities.

Noise is an everyday part of urban life, however excessive or unreasonable levels can cause stress, interrupt sleep, affect normal activities such as watching TV or reading a book, and generally leaves people feeling flustered and annoyed.

In Western Australia, the responsibility to ensure that air conditioners do not compromise our quality of life through unreasonable noise levels is placed upon both installers and owners or occupiers under the Environmental Protection Act 1986.

Noise–there is a limit

The Environmental Protection (Noise) Regulations 1997 effectively limit noise emissions from sources such as air conditioners by setting levels that must not be exceeded at the property boundary. Many complaints about noisy air conditioners are investigated by Environmental Health Officers, and it may be necessary for owners or occupiers to stop using their unit until it is modified to comply with legal requirements.

You and Your Installer

By making an informed decision when purchasing an air conditioner, and discussing its installation with your installer, potential noise impacts on your neighbours can be calculated, and compared with permitted levels, prior to installation.

Your installer is both professionally and legally required to carry out a noise impact assessment prior to the air conditioner installation, using noise output information for that unit as well as the site characteristics for that situation. The government and air conditioning industry provide an easy-to-use guideline (see last page in this guide) to assist your installer to determine which air conditioner is appropriate for your situation.

Disclaimer: This document is a guide only. It is not a legal document. For full details of your legal obligations, please refer to the Environmental Protection Act 1986 and Environmental Protection (Noise) Regulations 1997. For details on the noise output of specific air conditioning units, please contact your installer or manufacturer. Potential solutions are presented for domestic situations and are intended as a generic guide only.

What types of air conditioners are available?

There are 2 types of air conditioner, evaporative or refrigerative.

Evaporative Air Conditioners

These are installed on the roof of your house, and are generally ducted into each room to cool the entire home.

Advantages: The unit can be positioned as far as possible from all boundaries in the middle of the property, to increase the distance to each boundary.

Disadvantages: The units are often directly visible from the neighbouring properties, so there is no barrier to 'block' the noise entering nearby properties.

Refrigerative Air Conditioners

These may be either a ducted system that cools and/or heats the entire home (or large sections of the home) with one or two external units located outside the house, or a smaller split system servicing a single room with both an interior unit and exterior unit.

Advantages: 'Inverter' units are now available, which are quieter than non-inverters.

The external units are installed on the ground, meaning the boundary fence, if solid, can help to 'block' the noise. Positioning them in the middle of the property, (at the back or front of the house) may be the best option, as it can maximise the distance to your neighbours. They can also be placed on the roof on a roof mount if necessary, however the fence will not then provide a noise barrier.

Disadvantages: These units are often installed on the 'dead' side of the house, where the neighbouring house is quite close. This causes problems in most situations, regardless of whether it is close to your neighbours 'noise-sensitive' areas, such as bedrooms.

The noise produced by refrigerative units usually has a tonal 'whine', 'drone' or 'hum', meaning the noise is more intrusive. As a result, a 5 decibel (dB) tonal penalty is added to the noise level that the unit produces, resulting in an overall higher noise level.

Considerations to minimise noise from a new air conditioner

Select a suitable air conditioning unit for your situation.

Ensure that you purchase an air conditioner for residential use, and that it is not oversized. Domestic air conditioners are designed for use in residential areas—the noise level they produce outside must be lower than that which is permitted in commercial areas. Select the appropriate air conditioner for your situation, either an evaporative unit, or a refrigerative unit.

If you are installing more than one air conditioner, be aware that the noise produced will be higher if they are operated at the same time. One consideration if you are installing 2 units is to have 1 for cooling living areas, which is only used during the day, and 1 for cooling bedrooms, that is only used at night. Be aware that the permitted noise levels are very low at night-time, so the correct type and positioning is essential to ensure it does not impact on neighbouring bedrooms.

Considerations to minimise noise from a new air conditioner (continued)

Where will the external parts of the air conditioner be located?

When installing an air conditioner, the most important thing to consider is the location it will be installed in. The external components of the air conditioner should be positioned as far away from the closest neighbour. Consider the areas of your neighbours home that are noise sensitive (bedrooms, living areas, alfresco areas) and locate the external components as far as possible from these areas. The location of the external components may be limited by the type of air conditioner you purchase.

What is the sound power level?

Small to medium size refrigerative units will display a label identifying the Sound Power Level for the exterior component of the air conditioning unit. The lower the number, the lower the noise level. Information on the Sound Power Level for an evaporative unit may be obtained from the manufacturer. Comparing the Sound Power Level for different units can help you choose the quietest unit appropriate to your situation. Be aware that reverse cycle units are generally louder when heating.

Remember, spending a bit more to be able to purchase a quiet air conditioner may prevent even more costly modifications being necessary in the future.

Noise attenuation

Even the quietest unit positioned in the most appropriate location may create unreasonable noise on smaller blocks. Measures to reduce the noise, once the unit is installed are outlined below.

Reducing noise from an existing air conditioner

Generally the noise created by your air conditioner will come from either:

1. **The compressor** - noise associated with the operations of the valves and/or motor.
2. **The housing** - if the panels on the cabinet have loosened or vibrate they may contribute to noise from the unit.
3. **The fans** - depending on the number, their size, speed of operation, and/or the clearance between the fans and cabinet.

The following can be considered to reduce noise emissions:

- Your installer may acoustically treat the interior of the compressor or line it with a lead vinyl jacket
- Provide a barrier to block 'line of sight' noise to affected neighbours or to reflective surfaces
- Your contractor may install vibration mounts or silencers as appropriate to the installation, they may fit head pressure controller or dip-switches to reduce the maximum capacity at which the unit can be used (in some cases the noise may only be unreasonable at high fan speeds)
- Discuss with your neighbours when the noise is a problem. Adopt a day-night approach, eg. Operate the unit on 2/3 capacity during the day, and 1/3 capacity at night
- Relocate the unit (check the Fairair website) - this may ultimately prove to be the cheapest option.

Be aware that these options are only a guide and any modifications made to the unit must be done by a qualified person. A poorly designed noise enclosure could actually make the noise worse. Interfering with the unit or its housing may also void the warranty. Acoustical consultants can be found on the Australian Acoustical Society webpage **www.acoustics.org.au**

If the air conditioner is less than 2 years old, it may be covered by a warranty. You should also contact your air conditioner installer and discuss the problem with them, as well as what consideration they made regarding noise when installing the unit.

Case Example

Mark and Michelle are considering where to install their new air conditioning unit. They can put it 1 metre from the boundary fence on the side next to their neighbours patio (as pictured above) or at the rear of the house **4 metres** from the back fence.

The unit will cool their bedroom, so they want to use it at night. They use the Fairair website to find they need a unit that meets the following levels:

1 metre from the fence: 50dB

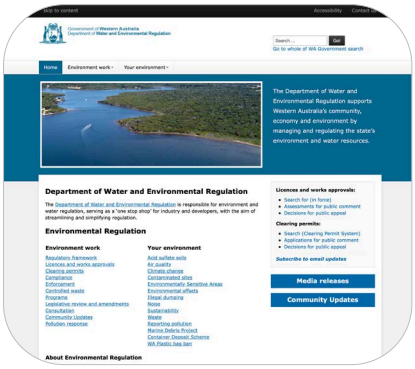
4 metres from the fence: 62dB

They investigate a number of units and find one that meets all of their requirements for interior use, and noting the sound pressure level of 61dB, place it at the rear of the property to ensure that their neighbours are not bothered by the noise.

Need more information ?

Other sources of helpful information:

The Department of Water and Environment Regulation (DWER) deals with pollution, under the Environmental Protection Act. Working closely with the local government Environmental Health Officers that investigate noise, the DWER develop and implement noise laws and policies throughout the state. Other general information on noise legislation is included under pollution prevention, at **www.der.wa.gov.au**



The Australian Institute of Refrigeration Air Conditioning and Heating (ARIAH) have created a website to provide in-depth information to consumers about home cooling options and products. Located at **www.fairair.com.au**, this website contains information and calculators to assist you to determine the anticipated energy use, select an air conditioner with an appropriate Sound Power Level and how to suitably size the unit for your situation. Remember: if your unit has a tonal hum to the noise it produces, you might need to look for a unit that is 5dB quieter.

General Advisory Notice Public Health Service
9 Coleville Crescent, Spearwood | **T** 08 9411 3444 | **F** 08 9411 3333
health@cockburn.wa.gov.au | **www.cockburn.wa.gov.au**