

# Cool air – quietly and efficiently

A guide to buying  
and operating an  
air conditioner

Noise from air conditioners can be a serious issue between neighbours. If an air conditioner is noisy or placed inappropriately it can disturb the quality of life of others, affecting concentration, mood and even causing loss of sleep.

It is illegal for Victorian residents to cause unreasonable noise, which can include noise from home air conditioners. There are also times during the night when you are not permitted to operate an air conditioner if your neighbour can hear it in their home.

If your local council receives a complaint and your air conditioner is causing unreasonable noise, they can direct it to be relocated or even switched off. To avoid noise issues, it is important to carefully select and locate your air conditioner, as well as maintain it over its life.

This guide gives tips on how to get the most from your air conditioner and avoid noise problems for your neighbours. Good purchasing, planning and design can also improve its efficiency, performance and value for money – while making your home a more comfortable place to live.

### **Good home design first**



If you are designing or renovating your home, remember that energy efficient and sustainable options are available that can reduce your air conditioning needs – helping to minimise noise and save operating costs in the long term.

- Make sure the house is well insulated, so that cooling and heating your home becomes more energy efficient. This includes insulating walls, double-glazing, heavy curtains and installing good seals around doors and windows.
- Consider other ways of reducing your need for an air conditioner. Layout of the living spaces and positioning of your home can improve the natural flow of air, giving a healthier and more comfortable environment. You might also consider installing ceiling fans as an alternative to air conditioning.
- Vegetation or awnings can screen windows from the western sun.

## Things to consider before you buy

### Noise from an air conditioner will be affected by:

- the noise level of the unit itself – you should be able to see the Sound Power (Lw) as shown on a sticker on the unit. The lower the number, the quieter the air conditioner
- where the motor of the air conditioner is located – the further from neighbours' bedrooms and other noise sensitive areas the better. Split systems offer more flexible placement of the motor than wall/window mounted units, which are a 'one box' design
- using an effective enclosure or barrier to reduce the noise. If the sound from the air conditioner is reflecting off nearby hard surfaces such as walls and eaves, noise levels can be increased
- ensuring the unit is working efficiently and is the correct choice for your home – choose the right size and design for the size and layout of the rooms which need cooling or heating
- the orientation, design and insulation of your home – energy efficient homes will need less heating and cooling and can have better natural ventilation – which reduces the need for an air conditioner or reduces its running costs
- if the air conditioner is well installed and maintained – poor installation or wear and tear can lead to noisy rattles and vibrations.

Remember - there is no Victorian law controlling the noise level of the air conditioner you purchase - it is your responsibility to ensure you don't install a unit that bothers your neighbours. Make sure you discuss noise impacts with your designer or installer.



### GREEN TIP

Using awnings or a pergola can protect your house from the heat of the western sun.

## Designing and buying an air conditioner

### Picking a model – buy quiet

Domestic air conditioners sold in Victoria usually have a label clearly displaying the sound power level (Lw). The number will indicate how noisy the air conditioning motor unit will be outside the house. The bigger the number; the louder the air conditioning unit.

The noise level will give you a general guide and will help a specialist to calculate how loud the unit will be once installed. If you want to be able to run the air conditioner at night, it will need to be quiet enough so that your neighbours can't hear it from inside their home, even with their windows open.

Different types of air conditioners will have different sound power levels. Generally the bigger the motor on each air conditioner type, the greater the noise level. Consider buying premium quality units designed for quiet operation.

If you want to be able to run the air conditioner at night, it will need to be quiet enough so that your neighbours can't hear it from inside their home, even with their windows open.

Also, look at the energy star rating for different systems. It is best to select an air conditioner with more stars. Tests conducted by the Australian Consumers' Association show that energy efficient models aren't always more expensive than those with higher energy consumption. Even if you do pay a bit more up front for a more efficient model, its lower running costs will compensate for the initial outlay.

### GREEN TIP

A well insulated house is more energy efficient, reducing the operating costs of your air conditioner.



## Choosing the right system for your home

It is important to plan your air conditioning needs. Ask yourself – do you want to air condition the whole house, or just a single room?

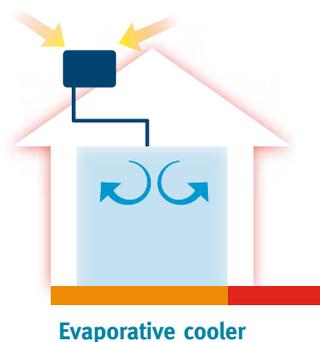
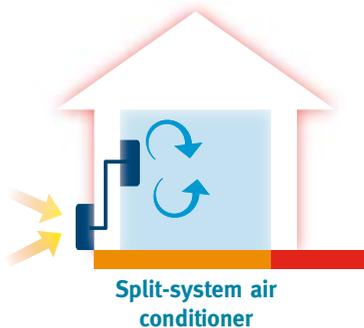
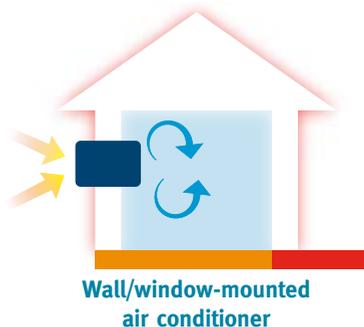
When air conditioning a single room, buy only the size needed to cool a single room. Trying to cool multiple rooms with an undersized air conditioner will cause the unit to work harder than it is designed for – causing greater noise, increasing maintenance requirements or contributing to motor burnout in the long term.

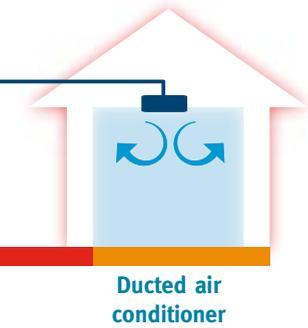
There are a number of different types of air conditioners currently on the market. These include wall/window mounted units, split systems, evaporative coolers and ducted systems. All types need to be installed correctly with consideration for noise, but some systems offer more flexibility than others.

**Wall/window mounted air conditioners** are usually fitted in a specially cut opening through a window or wall. All heating and/or cooling and circulation components are housed inside a single box. This type of air conditioner is usually mounted high in the window or wall of the room to be air-conditioned, which can be a problem if it is near to or facing a neighbour's bedroom or living area.

**Split-system air conditioners** have two main parts: the evaporator/control panel, which is located within your house; and the compressor/condenser/fan section, which is located outside. There is more flexibility in this type of system in where the outside motor/fan section can be located, making it easier to avoid directing noise towards a neighbour.

**Evaporative coolers** have a fan unit mounted on the roof, which is less noisy than a split system, but in built up areas the fan may be more exposed to neighbours living above your home.





**Ducted system air conditioners** can be designed with multiple zones, meaning you can air condition all of the home, or various zones at different times of the day. Ducted air conditioners have three main parts:

- compressor/motor/outdoor fan section (usually located outside)
- indoor section comprising indoor fan and other electric controls
- zone control box which controls the airflow to each of the selected ducts.

While ducted systems can be more expensive than other types of air conditioners, they are better at distributing cool/warm air around the house, and can offer greater flexibility in where noise-generating equipment can be located.

### Considering noise through ducts

Be mindful that noise can travel within ductwork, carrying sound from one room to another. A well designed room with good soundproofing can be compromised by poorly planned air conditioning. This is especially an issue when ductwork feeds into a home theatre/music room – sending noise from one room to another, or allowing it to exit your home, annoying neighbours. Special design and treatment will be required in these cases.

To avoid sound traveling through ducting, design for sufficient noise isolation in ventilation ducts. You may need to consult with an air conditioning specialist and acoustic consultant.

### GREEN TIP

Installing a ceiling fan can reduce your need to use air conditioning.



## When installing an air conditioner

Once you have decided on the best system for your home, remember the following when looking at installation:

- Plan your installation. Try sketching your house and your neighbour's house and locate any air conditioning units as far away from your neighbour's bedroom or sleeping areas as possible. The further away a sound source is, the quieter it sounds.
- Just as light reflects from shiny surfaces, noise can be reflected from hard surfaces onto neighbours. Noise levels can increase if the unit is located near to a number of reflective surfaces, such as in a corner or under eaves.
- Remember that outdoor spaces can also be negatively affected by noise. In particular, avoid placing the motor in hard surfaced areas like courtyards.
- Consider using barriers or enclosures – if a fence is solid with no gaps and blocks line of sight to your neighbours it can reduce noise levels. Air conditioning enclosures are also available.



- Installation of the unit and any barriers/enclosures must be done in accordance with manufacturer specifications for ventilation. This will avoid damage to the motor and voiding of the warranty.
- Air conditioners need to be well fastened as poor attachment can result in increased noise. This also applies to ductwork, which needs to be mounted and connected in a way that isolates it from transferring noise into the building. Methods such as resilient mounts, duct lagging and isolation springs or feet may be required.

Installation costs for a typical air conditioning system can be a significant part of the overall cost. It could turn out to be an expensive mistake if not planned properly.

Council can direct that a noisy unit be moved, enclosed or even switched off. Don't risk these costs – make sure the design and installation is right the first time.

Ask your supplier and installer to comply with the Residential Best Practice Guideline for Victoria published by AIRAH (Australian Institute of Refrigeration, Air Conditioning and Heating).

This publication can tell you and the installer what the maximum acceptable sound power rating will be for your proposed location of the unit. You can then consider options with the installer or supplier so that you can use the air conditioner without annoying the neighbours. Installation should be undertaken by a suitably qualified installer.



### GREEN TIP

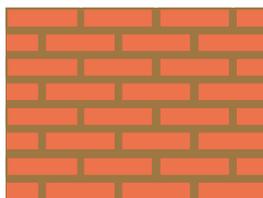
Buying the correct size air conditioner will reduce your initial and ongoing operation costs, and potential noise impacts on your neighbours.



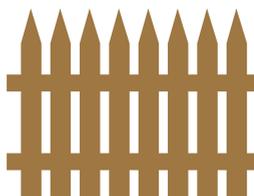
## Making use of barriers and enclosures

Barriers such as fences and garden walls can be used to screen noise from neighbours. To be effective, any fences or walls must block the line of sight from the neighbour's window to the air conditioner, be of solid construction and contain no gaps or holes. Examples of solid fences include brick, sheet metal and lapped palings – but not hedges, plants or picket fences.

If a fence located between the air conditioner and the neighbour is constructed of standard wooden palings that don't overlap, fitting additional palings could make it more effective.



**Solid wall with no gaps**



**Too many holes and gaps**

Check with the manufacturer of your air conditioner to see whether they have any after-market noise enclosures available. There are also a number of companies that sell noise enclosures, silencers and other treatments for air conditioning units.

Air conditioning units require ventilation to avoid overheating of the motor. Barriers and enclosures must not restrict airflow as this can affect the system's efficiency and noise levels.

You can obtain expert advice by looking in yellow pages under 'acoustical consultants' or 'acoustic materials &/or services'.



**Fitting additional overlapping palings could make an effective noise barrier.**


**GREEN TIP**

AIRAH's website, [www.fairair.com.au](http://www.fairair.com.au), offers a guide for choosing a cooling system, including size, energy and noise calculators.



## Ongoing maintenance



Noise from an air conditioner motor can increase over time due to things like worn bearings or rubber mounts, loose panels or fasteners, damaged fan blades, or a worn compressor. A rattling or whining sound may tell you the unit needs cleaning or maintenance.

General maintenance is important to make sure the unit is running properly and not causing unnecessary noise. However, when an older unit needs repair it's often cheaper to replace it with a newer, quieter and more energy efficient model.

- Make sure that all fixtures and fittings are secure and not causing any excessive vibration or rattling.
- Check rubber mounts and mounting brackets for deterioration and wear.
- Check to make sure the air conditioning unit and fan blades are clear of all vegetation and debris.
- Clean any dust grilles or air filters.
- Have the air conditioner serviced by an appropriately qualified technician.

All air conditioners should be maintained and serviced by a suitably qualified technician in accordance with manufacturer's recommendations.

## What to do if you have a noisy air conditioner

If you have a noisy unit, consider the following:

- Does the unit need maintenance or replacing? Older units may need a clean or maintenance, or you may find it better and cheaper to replace it with a newer model.
- Can you install a barrier or enclosure? These can be effective ways to reduce noise if a unit is well maintained and working properly.
- Do you have to restrict the hours you use the unit? If the noise is annoying you neighbours at night, then you may have to switch it off for certain hours
- Move the motor? If you need to run the air conditioner and there are no options for maintenance, barriers or enclosures then you may be required to relocate the unit further away from neighbours.

If the unit is causing unreasonable noise, including if it can be heard in a neighbour's home during nighttime hours (even with their windows open), then you may be required to take action to reduce the noise. It is more practical and cheaper to properly design and install an air conditioner than to try to fix problems later.

## Where to get more help

### EPA Victoria

**P:** 9695 2722

**W:** [www.epa.vic.gov.au](http://www.epa.vic.gov.au)

**Publications:**

*Annoyed by noise?* (EPA publication 406);  
*Noise control guidelines* (EPA publication TG302-92)

### Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH)

**P:** 9614 8868

**W:** [www.airah.org.au](http://www.airah.org.au)

**Publication:**

Residential Air Conditioning Best Practice Guideline (Victoria)

### Sustainability Victoria

**P:** 8626 8700

**W:** [www.sustainability.vic.gov.au](http://www.sustainability.vic.gov.au)

In case of domestic noise issues you should contact your local council for help.

## Air conditioner checklist – consider the following

- Consider air conditioning as part of home design that encourages energy efficiency.
- Consider cost effective alternatives such as ceiling fans.
- Can you use trees, shrubs or awnings to shade windows from the western sun?
- Are you looking at air conditioning the whole house, or just a single room? Bigger is not always better and there are many options available.
- Will the air conditioner service noisy home theatre/music rooms as sound may escape through ducts?
- Shop around for a reputable air conditioning installer with experience and all appropriate licences, who also has an understanding of noise issues associated with air conditioners.
- Discuss noise issues with your installer and make sure you make informed decisions when choosing a unit and its location.
- Buy quiet – check the sound power level (Lw) of each unit and buy the quietest model available to suit your needs.
- Where will the outside equipment be located and how close will it be to neighbours' bedrooms, living rooms and other sensitive spaces such as courtyards?
- Be aware of existing barriers and reflective surfaces.
- Consider the up-front installation of noise treatments such as acoustic enclosures, making sure the unit has proper airflow.
- Ask your installer to follow the AIRAH Residential Best Practice Guideline for Victoria.
- Maintain your air conditioner throughout its life.