

Noise considerations for residential air conditioning

In recent years, the increase of residential air conditioning systems used in Australian homes has generated an increase in complaints about noise.

When noise becomes too loud in our living places, it can have significant impact on our health and wellbeing by disturbing and preventing sleep, relaxation and communication.

Suppliers, installers and maintainers of residential air conditioning systems have a professional and legal obligation to make sure that every practical and reasonable effort is made to reduce inappropriate noise from air conditioning systems.

Residential appliance noise

Changing lifestyles and new technologies has seen an increase in use of powered appliances. Air conditioner noise complaints made to city councils have greatly increased over the past few years and may be attributed to a number of factors including a decrease in distance between neighbours due to an increase in high density living, combined with an increase in domestic air conditioning sales.

Allowable noise levels

A scale called the 'decibel scale' (dB(A)) is used to represent how loud a particular noise is.

Noise levels are typically measured at the boundary of the property emitting the noise. In multi-unit complexes the measurement is taken inside the neighbours' unit.

Each Australian state has regulations on allowable noise limits, and if these are not adhered to, fines may be issued.

It is therefore important to select the quietest air conditioner possible and have it installed as far away from any surrounding dwellings and houses as possible.

Noise labelling

Most Australian regulations now require that residential air conditioners have a label clearly displayed which shows the Sound Power Level (Lw) of the unit.



Split system outdoor unit.

The Sound Power Level will give you an indication on how noisy the air conditioner will be outside the house. The higher the number, the louder the air conditioning unit will be.

Some air conditioners may also have Sound Pressure Levels (Lp) stated on the label. This number is different from the Sound Power Level.

Education

Noise issues associated with the use of appliances such as air conditioners are often the result of homeowners being unaware that their actions are adversely affecting neighbours. Homeowners are also unaware that by exceeding noise levels, they are breaking the law and could be fined for such activities.

Raising people's awareness of noise nuisances and potential penalties that may apply will ensure reduction of these nuisances.

Likewise, limited advice from retailers and installers, and lack of forethought and planning by owners, retailers and installers on the location and use of air conditioners also contributes to noise impacts in the community.

Manufacturers, installers and retailers have an obligation to provide responsible advice and service to prevent noise nuisance up-front.

Practical steps to minimise air conditioner noise

Where will the air conditioner be installed?

Consider where the air conditioner is likely to be installed. Some air conditioning systems are quieter than others and some have more flexibility in where they can be located.



Evaporative cooler outdoor unit.

Air conditioners should not be located adjacent to neighbours windows, bedrooms or living areas.

Split systems have more flexibility in the way they are installed and the outside unit can be located closer to the ground. This allows fences and barriers to be used to screen the noise from the unit.

The closer the air conditioner is to the neighbour the quieter it will need to be.

Just as light reflects from shiny surfaces, noise can be reflected from hard surfaces onto a neighbour's property.

Avoid locating the air conditioner near multiple reflective surfaces such as walls and eaves.

Acoustic barriers

If the air conditioner is well maintained and operating properly, but is still causing excessive noise, consider the use of acoustic barriers.

Fences and garden walls can be used effectively to screen neighbours from noise, however to be effective, any fences or walls must block the line of sight of the air conditioner, be of solid construction and contain no gaps or holes.

If a dividing fence is located between the air conditioner and the neighbour, it may be constructed of standard wooden palings with gaps between the palings. The fitting of additional overlapping palings could make an existing fence an effective noise barrier.

If room permits, an air conditioning barrier

could be a cost effective option. In order for this to be effective, the barrier must block line of sight to the affected neighbours and the air conditioner must be located away from multiple reflective surfaces, such as corners and eaves, which could reflect noise and decrease the effectiveness of the barrier.

Air conditioning enclosures

There are a number of companies that market full noise enclosures for air conditioning units.

Check with the manufacturer of your air conditioner to see whether they have any after market sales of noise enclosures.

Always make sure when enclosing air conditioning units that you check the manufacturers' specifications for ventilation, to avoid damage to the outdoor unit and voiding of the warranty.

Determining the noise impact of the air conditioner

AIRAH has developed www.fairair.com.au, a website that provides in-depth, unbiased information about home cooling options and products. It also provides an easy to use noise calculator.

This noise calculator provides the maximum noise values allowable by the air conditioner and in-turn assists in deciding which unit will

be the most appropriate to use. Under law, compulsory labels must now stipulate the noise value made by the air conditioner. This label can be found on the outdoor unit.

The maximum noise values provided by the fairair noise calculator are based on the AIRAH recommended maximum noise levels from the air conditioner at the property boundary; 45dB(A) maximum during the day and 35dB(A) maximum at night.

Please note that this is a recommended figure only – most councils around Australia have varying noise regulations.

The noise calculator prompts users to input data based on three factors that impact air conditioner noise.

- **Distance from air conditioner to boundary (metres)**
- **Barrier factors**
- **Reflective surfaces**

1. Distance to boundary (metres)

User's must input the distance in metres from the air conditioner to the boundary of the property.

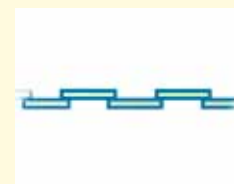
2. Barrier factor

Having a barrier between the proposed air conditioner location and the noise-sensitive location on the neighbouring property will reduce noise problems.

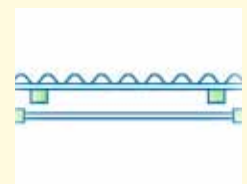
The calculator takes into account the following factors.

- Is there a fence/barrier which prevents the air conditioner being seen from the noise sensitive location on the neighbouring premises?

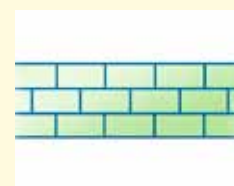
Barrier factors



Typical paling fence.



Solid fences with no gaps.



Solid concrete block.

- Is there a fence / barrier which only just blocks the "line of sight", and it has gaps in it (standard picket fence, brick fence with decorative open inserts, etc)?
- Is there a fence / barrier which only just blocks the "line of sight" and is made of solid material?
- Is there a fence / barrier with gaps (eg. hedges / bushes / trees, picket fence, fence in disrepair with holes or missing planks, wire mesh fence, brick fence with decorative open inserts)
- Is there a typical paling fence (eg. 13mm thick planks overlapped by 25mm, air gaps between palings due to warping etc.) which completely blocks "line of sight" to the air conditioner from noise sensitive locations' view?
- Is there a solid fence with no gaps, flush to the ground (eg. galvanised iron, fibre cement sheeting, 20mm pine planking with 35mm overlap) which completely blocks "line of sight" to the air conditioner from noise sensitive locations view?
- Is there a solid concrete block / masonry / brick fence / barrier which completely blocks "line of sight" to the air conditioner from noise sensitive locations?

3. Reflective surfaces

Noise can bounce (or 'reflect') off flat surfaces, so the number of flat surfaces near the proposed installation site and their locations need to be taken into account.

Where is the reflective surface?

One reflective surface: Side of building?
On ground? On roof?

Two reflective surfaces: On ground?
Side of building? Between two walls? On roof?
Under carport?

One reflective surface



One reflective surface – on roof.



One reflective surface – on ground



One reflective surface – on side of building.



Residential air conditioning has become increasingly popular in Australian homes.

Two reflective surfaces



Two reflective surfaces – on ground.



Two reflective surfaces – under carport.



Two reflective surfaces – on roof.



Two reflective surfaces – side of building.



Two reflective surfaces – between two walls.

The calculation

The noise calculation provides users with a maximum sound power level: Day= dB(A) and Night= dB(A)

The figure given is based on the data supplied and is indicative only. Further advice should be sought on the exact location of the unit to ensure compliance with state and local noise regulations.

Installers should also be aware that local noise regulations change from time to time, and some councils may have exceptions or differing regulations.

Visit www.fairair.com.au ■

This month's skills workshop is intended as a guide only.

AIRAH has developed residential air conditioning best practice guidelines for all Australian states. These are available to download from www.airah.org.au

Please consult your local regulations prior to determining your residential air conditioning installation.