

Air conditioner sizing and energy use

It is important to have a correctly sized air conditioner. An undersized unit will not provide adequate cooling or heating. Over-sizing can result in frequent on-off cycling, which is not efficient and increases wear and tear. It can also result in cooling with limited humidity reduction.

The air conditioner output, measured in kilowatts (kW), is stated on the label. As an approximate guide for sizing, allow 125 Watts (0.125kW) per square metre of floor area to be cooled in living areas, and 80 Watts (0.08kW) per square metre in bedrooms.

It is advisable to get a full heating and/or cooling load calculation from the air conditioning installer or manufacturer, to determine the appropriate capacity.

The amount of use an air conditioner gets, and therefore its annual energy consumption, varies widely around Australia, as the climate is quite different in different locations.

The table below gives typical annual operating hours at rated capacity for air conditioners in different locations. These figures can be used for estimating the annual energy consumption and running costs of air conditioners.

Check the typical annual operating hours for your location before estimating the annual running costs.

City	Cooling (Hours/yr)	Heating (Hours/yr)
Adelaide	200	250
Brisbane	600	100
Canberra	150	500
Darwin	2000	-
Hobart	50	450
Melbourne	100	350
Perth	300	150
Sydney	180	200

Estimating running costs

Use the number in the blue or red energy consumption box as a guide to the typical running cost of a model. Multiply the figure by your electricity tariff to estimate the hourly running cost, then by the typical hours of cooling/heating for your location to estimate the annual running cost. To estimate the lifetime running cost, multiply this figure by 12.

Example:

For a reverse-cycle air conditioner with an energy consumption of 1.57 kWh per hour on the cooling cycle and an electricity tariff of 13.94c/kWh (\$0.1394/kWh), the lifetime running cost for cooling would be:

$$1.57 \times \$0.1394 \times 300 \times 12 = \$788$$

The labels can also be used to estimate the lifetime greenhouse gas emissions. For each kWh of electricity consumed, around 1kg of carbon dioxide is emitted at the power station, so for the example above the greenhouse gas emissions are:

$$1.57 \times 1 \times 300 \times 12 = 5,652 \text{ kg or } 5.65 \text{ tonnes}$$

The actual running costs and greenhouse gas emissions will depend on your electricity tariff, the local climate, the size of the room being conditioned, house design, thermostat settings and operating times.

Log on to www.energyrating.gov.au or call the Sustainable Energy Development Office's Energy Smart Line (1300 658 158) if you need help estimating running costs.

Typical 12-year running cost for air conditioners



Based on reverse-cycle air conditioner, 150 hours each of heating and 300 hours cooling per year; 4.0 kW capacity, 13.94c/kWh tariff

Your guide to energy smart

air conditioners

Further information and advice

SEDO's Energy Smart Line (WA only)

Phone 1300 658 158

National energy rating web site

www.energyrating.gov.au

The Reach for the Stars program is a national initiative supported by the Sustainable Energy Development Authority in New South Wales, the Sustainable Energy Authority Victoria, Energy SA, the Sustainable Energy Development Office in Western Australia and the Australian Greenhouse Office.



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choosing an energy smart air conditioner

Most people consider features such as type, capacity, looks and price when buying a new air conditioner.

The lifetime running costs of different air conditioners can vary significantly. So, it's important to also check the energy efficiency and running costs when shopping around.

All new single phase domestic air conditioners are now required to carry Energy Rating labels which use star ratings to help you compare the energy efficiency of different models.

Quite simply, *the more stars you see, the more money you'll save and the better it will be for our environment.* Even a one star improvement can give savings of around 10% on running costs.

This consumer guide tells you how you can use the Energy Rating labels to compare different models of single phase air conditioners.

If you're about to buy a new air conditioner:

- Compare the *star ratings!*
- Ask for a **Top Energy Saver Award Winner (TESAW)** model—they are the most energy efficient appliances on the market!



Using the Energy Rating label



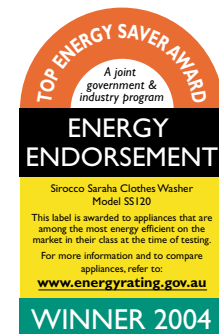
Reverse-cycle label

When comparing models, make sure you:

- **Check the star rating**
The more stars, the more energy efficient the model.
- **Check the energy consumption box**
The number in the blue (cooling) or red (heating) box is the amount of electricity used to run the air conditioner at rated capacity for one hour (in kWh per hour). It is based on testing to the Australian Standard listed on the label. The lower the number, the less it will cost to run and the lower the environmental impact.

If you are comparing two models with the same capacity which have the same star rating, the model with the lower energy consumption is the more energy efficient one.

Top Energy Saver Award winners



An easy way to make sure you choose the most energy efficient air conditioner is to ask for Australia's star energy performers—*TESAW* winners.

Each year, a government authority presents *TESAW* to air conditioners that have the highest star ratings.

TESAW winning appliances represent the top appliances on the market in terms of their energy efficiency.

Choosing a *TESAW* winning air conditioner could have a big impact on household energy costs.

For a 4.0 kW output from a reverse cycle air conditioner used for both heating and cooling, the savings could be as much as \$439 over a 12-year lifetime. This would also reduce your greenhouse gas emissions by some 3.1 tonnes.

For more information on Award winning appliances log onto the Top Energy Saver Award Winner web site www.energyrating.gov.au/tesaw-main.html.

top star rated air conditioners

For details on models on the market, contact the Sustainable Energy Development Office's Energy Smart Line on 1300 658 158, or visit the Energy Rating web site at www.energyrating.gov.au where you can find:

- ✓ More detailed information on Energy Rating labels for air conditioners
- ✓ Up-to-date listings for all registered air conditioners
- ✓ A cost calculator to help you more accurately estimate the lifetime running cost of air conditioners
- ✓ Information on country of manufacture by selecting the 'Show comprehensive detail' option

The web site even allows you to search for different types, brands and capacity ranges of air conditioners.

Inverter (variable speed drive) units

These use a variable speed motor to drive the compressor. Rather than cycling on and off when operating below rated load, the compressor runs continuously as it can vary speed to suit the output required. While these systems may look less efficient at full load (e.g. the star ratings may not be as high as for conventional air conditioners), they tend to operate more efficiently below full load.

If you intend to use the air conditioner for long periods of time it may be worth considering an inverter system.

The more stars you see, the more you'll save