



Australian Government

Department of the Environment and Energy

The new zoned energy rating label for air conditioners

What installers and retailers need to know



© Commonwealth of Australia, 2019.



The new zoned energy rating label for air conditioners—What installers and retailers need to know is licensed by the Commonwealth of Australia for use under a Creative Commons Attribution 4.0 International licence with the exception of the Coat of Arms of the Commonwealth of Australia, the logo of the agency responsible for publishing the report, content supplied by third parties, and any images depicting people. For licence conditions see: <https://creativecommons.org/licenses/by/4.0/>

This report should be attributed as '*The new zoned energy rating label for air conditioners—What installers and retailers need to know*, Commonwealth of Australia 2019'.


The Commonwealth of Australia has made all reasonable efforts to identify content supplied by third parties using the following format '© Copyright, [name of third party]'.

Disclaimer

The views and opinions expressed in this publication are those of the authors and do not necessarily reflect those of the Australian Government or the Portfolio Ministers for the Department of the Environment and Energy.

Contents

Overview	1
Old Energy Rating Label (ERL)	1
Explanation of the new label	2
How to read and use the new label	4
Common questions from customers	6
Where can I get more information?	14
Contact us	14

The image shows two white air conditioning units mounted on a light blue wall. The unit on the left is in the foreground, showing its large circular fan grille and a vertical vent on the right side. The unit on the right is slightly behind and to the right, also showing its fan grille and vent. The background is a clear blue sky and a dark blue roofline with a wooden decorative element.

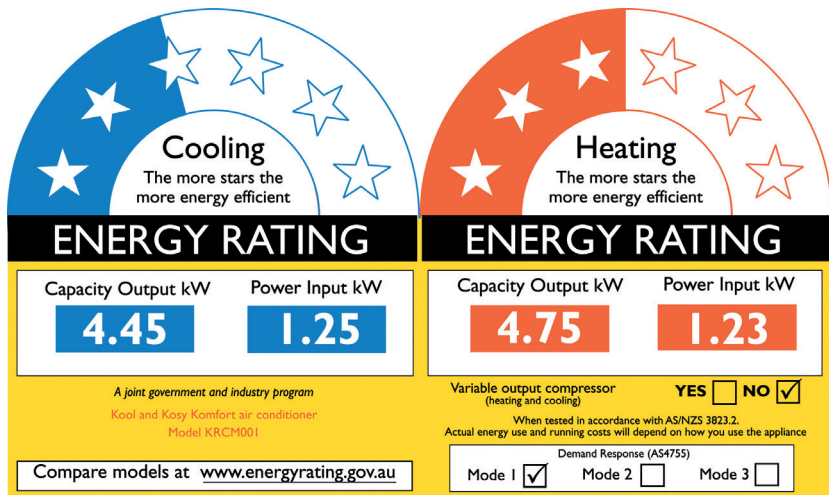
In Australia, air conditioners are regulated under the *Greenhouse and Energy Minimum Standards Act 2012* (GEMS Act), which provides a national framework for product energy efficiency in Australia.

Overview

There is a new zoned energy rating label for air conditioners. The new label is already on some air conditioners and will be mandatory for all new air conditioner models from 1 April 2020. Portable air conditioners will need to display energy rating labels for the first time.

This booklet provides an overview of the new label and the information it contains, answers to some questions that may be asked by customers and contact details of where to get more information.

Old Energy Rating Label (ERL)



The old energy rating label for air conditioners will still be able to be used for several years until the current set of registrations expires.

Explanation of the new label

This example tells you that if the temperature outside is hot (35 °C), then the air conditioner can provide 4 kilowatts (kW) of cooling.

This is the brand and model of the air conditioner, so you can be sure you are looking at the right information for the right air conditioner.

There are three bands of ratings, for **HOT**, **AVERAGE** and **COLD** areas in Australia and New Zealand. Use the map to see which band you should use.

For example:

- Melbourne is in a black '**COLD**' area—read the black Cold ratings.
- Brisbane is in a white '**HOT**' area—read the white Hot ratings.
- Sydney is in a grey '**AVERAGE**' area—read the grey Average ratings.

This tells you how loud the air conditioner will be when it is running. The number inside the house is how loud it will be inside the home, and the number outside the house is how loud it will be near the outside unit. Depending on the type of air conditioner there may be an indoor noise rating, an outdoor noise rating or both.

ENERGY

As tested to government regulations



COOLING

CAPACITY AT OUTDOOR TEMPERATURE

Fudaison Inverter Super
air conditioner

Model: KRCM001

Location changes
the efficiency of
this appliance

Noise (dB(A))

49

This tells you how much heating the air conditioner can provide.

- This example tells you that if the temperature outside is cold (7 °C), then the air conditioner can provide 5.5 kW of heating, and
- If the temperature outside is very cold (2 °C), then the air conditioner can provide 8.8 kW of heating.

RATING

ions – actual usage may vary

Compare models at
www.energyrating.gov.au [®]

A joint government and industry program

NG

RATURE ▶

35°C

4.00 kW



HEATING

CAPACITY AT OUTDOOR TEMPERATURE ▶

7°C

5.50 kW

2°C

8.80 kW

comfort

The more stars, the more energy efficient

Energy use

HOT Brisbane, Darwin, Pacific Is				933
				93 kWh per year
AVERAGE Adelaide, Perth, Sydney				315
				619 kWh per year
COLD Canberra, Hobart, Melbourne, New Zealand				205
				1568 kWh per year

T 59

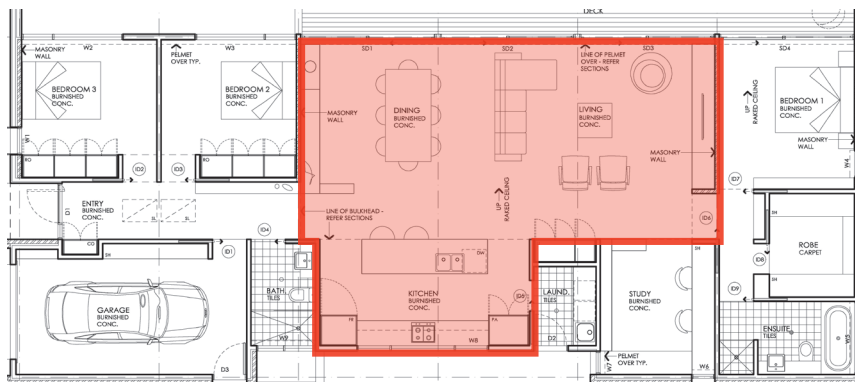
This tells you how efficient the air conditioner is:

- the **blue** stars show how efficient it is at cooling
- the **red** stars show how efficient it is at heating.

This gives an indication of how much electricity the air conditioner will use each year for cooling and heating. The lower the kilowatt hours (kWh) used, the lower the cost to run the air conditioner. If customers know their electricity tariff, you can multiply it by this rate to estimate the cost to run the air conditioner per year. Customers can get help finding their electricity tariff at energymadeeasy.gov.au/help/electricity-bill or by contacting their electricity retailer.

How to read and use the new label

The most important thing customers need to know when purchasing an air conditioner is the size of the space they are heating or cooling. Ideally they should also take into account other aspects of the space the air conditioner is going into such as the size and orientation of windows, insulation and shading. Having determined what size of air conditioner they require (through obtaining professional advice, use of an online air conditioner sizing calculator or the like) customers can then use the Zoned Energy Rating Label (ZERL) to compare air conditioners of similar capacity.



Air conditioners are sized based on their cooling or heating capacity. On the ZERL this is shown by the 35°C, 7°C and 2°C numbers in the blue and red boxes near the top of the label. Customers should size their unit with more emphasis on the function (cooling or heating) they will use most. If the customer lives in an area where the temperature regularly drops below 7°C they should check to see that the 2°C heating capacity figure on the label is not significantly less than the 7°C number.

Customers should look at the map to see which zone they are in. Some major cities are near the edges of their zones, but all the capital cities are listed in the star rating boxes to the right of the map, with Brisbane in the Hot zone and Adelaide, Perth and Sydney in the Average zone. Then customers should check the star ratings to find which air conditioner is more efficient for their climate zone.

The kWh per year figures at the right hand edge of the star rating box give an indication of how much electricity that air conditioner may use for heating and cooling in that zone. They are only an indication, because air conditioner use will vary by household.

Energy use

933

Note that as the heating function is not used much in the Hot zone, even a low efficiency air conditioner will not have a large kWh per year figure for heating.

93

kWh per year

For customers to get an idea of how much it may cost them to run the air conditioner in a year they should add the blue and red kWh figures for their zone together, then multiply by their electricity tariff. An average electricity tariff in Australia is about \$0.29 per kWh.



The house icon at the bottom of the label indicates how much noise the air conditioner will make when operating at full power. For air conditioners with both internal and external units, there are separate inside and outside noise ratings. Portable units will only have an indoor noise figure while ducted units will only have an outdoor noise figure. The external noise level may be important if the unit is near a window, bedrooms or close to a neighbour's house (particularly in body corporate situations where there may be specific requirements).

Common questions from customers

Why the change?

To provide consumers with more and better information about expected energy use for air conditioners, based on where they live. The new label will help people when buying an air conditioner and help people to save money on their household energy bills. The new labels provide information about likely energy use by the air conditioner over the course of the year. This information is more useful to consumers than the power draw at full load figure that the old label provided.

Why are there two different types of air conditioner labels in the shop?

There is a transition period where both the old Energy Rating Label (ERL) and the ZERL may appear on products in store. This may create confusion for customers and lead to additional questions for you as the product expert dealing with the customer.

All air conditioner models new to the market from 1 April 2020 will have the ZERL. Current models in stores may have registrations that run through to 2025 and can continue to use the old label until their registration expires. Over time the old ERL for air conditioners will disappear and be replaced by the ZERL.



Are the stars the same? Can I compare the stars on a product with the old label and another product with the new label?

No, they are not the same. Nor is it possible to convert the old stars to the new stars.

The star ratings on the old label measured how much cooling or heating output was achieved per unit of power. It related to the efficiency of the air conditioner at a particular temperature, but did not take into account consumer usage patterns to determine typical electricity use.

The star ratings on the new label reflect how the air conditioner will perform over a range of temperatures and allows an annual electricity figure to be calculated (these are the blue and red 'kWh per year' figures on the ZERL). This makes the new label more like the energy rating labels on other appliances such as fridges, televisions and washing machines, where you can also see a 'kWh per year' energy use figure.

My home should not be in that climate zone. How were the zones decided?

Two of the most important factors in how air conditioners perform are the level of humidity and the frequency of frosts.

Air conditioners are generally designed for optimal performance in different climatic conditions, with some units designed to perform best in cold, frosty conditions, or in hot and humid conditions.

The Hot zone is one where the summer cooling season is often associated with high levels of humidity. It is also one where reverse cycle air conditioners will not be used for heating very often and the unit will rarely have to run a defrost cycle.

While the Average zone can get as high or higher temperatures than the Hot zone reverse cycle air conditioners in the Average zone will also be used in their heating function for weeks or months over winter and the air conditioner is likely to need to run several defrosting cycles.

In the Cold zone the heating function is used much more than the cooling function and the performance of the air conditioner in frosting conditions (below 5.5°C) is critical in determining the overall performance of the air conditioner.

When the outside temperature is below 5.5°C, water that condenses from the air on the refrigerant coils of the air conditioner will freeze, which means that an air conditioner will need to run a defrost cycle to remove ice. This is why the performance of an air conditioner in frosting conditions is so important. Air conditioners designed to work in hot and humid conditions can perform very poorly in frosting conditions.

The three climate zones shown on the label are underpinned by the 69 NatHERS (Nationwide House Energy Rating Scheme) zones for Australia. More information on the detail underlying the development of the three zones for the label can be found at energyrating.gov.au.

How loud is that noise level on the label?

For comparison, here are some common sound levels (in decibels):

- **30dBA:** typical noise in a quiet home
- **50dBA:** inside of a quiet car while driving
- **60dBA:** having a typical conversation
- **75dBA:** an operating vacuum cleaner.

A noisy indoor unit may interfere with your activities, conversation or sleep. A noisy outdoor unit can disturb you (if it is too close to a bedroom or living room window) or your neighbours.

The noise levels on the label are measured with the air conditioner running at full capacity on its cooling function. For much of the time an air conditioner is running, its noise level will be lower than the level indicated on the label.

How much will it cost to run per year?

The label gives an indication of energy use per year for an air conditioner model. Customers need to add up the heating and cooling figures for their climate zone and multiply that by their electricity tariff to get an indication of how much it may cost to run per year. The average electricity tariff across Australia is \$0.29 per kilowatt hour (kWh). If customers use the air conditioner a lot, then the air conditioner will use more electricity per year and cost more to run.

What does one star mean?

The stars are a way to compare the performance of similar capacity air conditioners, with more stars being better. A one star air conditioner means that, compared to other air conditioners with similar capacity, it is one of the poorest performers in terms of energy efficiency.

In technical terms a one star air conditioner has a Total Cooling Seasonal Performance Factor or Heating Seasonal Performance Factor of between 2.5 and 3. In contrast a three star air conditioner has a Total Cooling Seasonal Performance Factor or Heating Seasonal Performance Factor of between 4.5 and 5.

Can I find a 10 star air conditioner?

The best unit at the time the ZERL was developed achieved an 8 star cooling rating in one zone. This leaves room for air conditioner efficiency to improve over time without having to re-calibrate the star ratings.

Why do portable air conditioners have zero stars?

Single duct (one hose) portables blow cool air out the front of the machine so that if you sit in front of it you feel cool, but the unit has no overall cooling effect on the room. Air conditioner stars are awarded on how efficiently they cool a room (or heat a room in the case of the heating stars). As single duct portables do not cool the room, they are awarded zero stars.

Some portable air conditioners may have two hoses ('double duct' air conditioners). These air conditioners can heat or cool a room and therefore can achieve more than zero stars.

Why do air conditioners work differently in different climates?

There are various aspects of an air conditioner that can be optimised for the most efficient performance. Some are designed to have their maximum efficiency when they are working at full capacity, such as on the hottest days. Others are designed to cope best when working at part-loads, when only a small amount of cooling is required. Some are optimised to remove humidity, and some are optimised to perform better in frosting conditions.

The feeling of being hot is a combination of both temperature and humidity. All air conditioners remove some humidity from the air, but in some climates, such as Darwin, a room will feel cooler if the air conditioner is designed to deal with high levels of humidity. In technical terms, this means the air conditioner will remove a higher proportion of 'latent heat', relative to 'sensible heat'. The Hot climate on the label covers primarily the hot and humid areas of Australia.

When the outside temperature is below 5.5°C, the air conditioner will need to deal with frosting conditions. This requires a diversion of some heating capacity to defrost the refrigerant coils. This can result in less efficient operation during a defrost cycle to maintain desired room temperature.

Why are there two heating capacity numbers but only one cooling number?

The star ratings are calculated based on the performance of an air conditioner across a range of temperatures. The first heating capacity number is based on an outside air temperature of 7°C. As it gets colder outside, more heating is required to maintain inside temperature. Some air conditioners are better able to provide this extra heating, as shown by having a larger capacity number at 2°C than 7°C.



Showing the heating capacity at 2°C gives an indication of how well the air conditioner can cope with frost. The outside unit of an air conditioner expels cold air, as part of the process of heating a room. The outside unit has to deal with frost at outside temperatures of less than 5.5°C. Some air conditioners are not well designed to cope with frost and may provide less heating at 2°C than at 7°C.

Customers should size their units on the 35°C cooling capacity, if they intend to use the air conditioner mainly for cooling. If a customer expects to use the air conditioner mainly for heating, they should use the 7°C heating capacity for sizing. However, if a customer lives in an area where overnight winter temperatures can get down to 2°C or less, they should check that the heating capacity at 2°C is the same or greater than the heating capacity at 7°C, and use this number as a point of comparison between different models.



How do I display the new labels?

As there is a long transition period, the requirements for displaying the correct energy rating label will depend on several factors such as the type of air conditioner and when the model was registered. Your supplier/distributor should provide you with the correct labels for the models you are supplying and displaying in store.

If the model has a ZERL, you need to ensure:

- each model being displayed in store, or represented by a display unit, has its own ZERL
- the ZERL is stuck on or attached to the model or display unit
- if there is no model out of its packaging, but the packaged model is on display, a ZERL must be displayed on the packaging
- for portable units (single and double duct): all portable units registered from 1 April 2020 must display the ZERL and meet the labelling requirements of the 2019 Determination. Stock that has already been manufactured or imported into Australia prior to 1 April 2020 can continue to be sold until that stock is exhausted, but no new stock may be manufactured or imported into Australia after that date unless it is registered to the 2019 Determination.

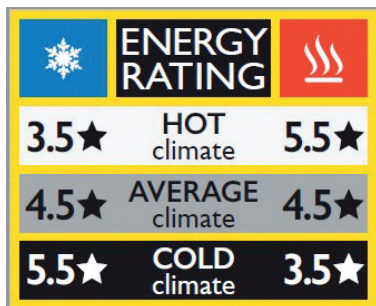
What about labelling on a dummy head display?

You must display a ZERL or ERL on a dummy head display, depending on the requirements for the models you are displaying (see previous section for more detail).

Where a model is required to display a ZERL, and you wish to advertise multiple models on a single dummy head unit with price tags and information, the ZERL for each model must be displayed.

What about online advertising?

A new Zoned Energy Rating icon has been developed that can be used in print and online advertising. It cannot be used on physical products or packages in store.



The icon is much simpler than the label, while still providing the heating and cooling star ratings for each zone. Unlike the label, which is a fixed 18cm by 13cm size, the icon can be shrunk or expanded to fit the available space. More information about the icon can be found at energyrating.gov.au/products/space-heating-and-cooling/air-conditioners.

How do I get a replacement label?

If a label is missing or damaged, contact the supplier of the air conditioner to get them to provide you with a replacement label. Ensure that you are aware of your responsibilities under the GEMS Act for labelling of display stock.

Where can I get more information?

The energy rating website has more information on the energy rating label, a registry listing all the air conditioner models for sale in Australia with further information on the energy performance and other useful energy efficiency information: energyrating.gov.au

Contact us

GEMS Regulator
Department of the Environment and Energy
GPO Box 787
Canberra ACT 2601

Web: energyrating.gov.au

Email: energyrating@environment.gov.au

YouTube: search for GEMS Regulator

