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Meaco's cooling product buyer's guide

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With summer on the way we can all look forward to warmer weather. British summers are becoming longer and hotter, and four out of five of the hottest days in Britain's history have occurred since 2019. With temperatures reaching over 37°C in a heatwave, getting a good night's sleep can be especially difficult.

Cooling fans and portable air conditioners are the answer to keeping cool during sweltering days and nights, but what product is the most cost effective based on your needs and your budget? With the latest steep energy prices in the UK, energy prices and the cost of running any appliance are also critical.

This guide you will help you understand how to select the right fan or portable air conditioner for you and includes what features should form an important part of your selection process.

This guide will answer key questions such as:

- What type of cooling products should I consider?
- Which is most energy efficient for my need?
- What are the pros and cons of each?
- How can I keep cool and keep costs down?
- How do I calculate running costs for an appliance?

We have also included low-cost, practical tips on how to make your home or office as cool as possible this summer.

Understanding energy usage

Before purchasing any appliance, it is valuable to understand how much energy it consumes and what it will cost to run. Major appliances like washing machines, fridges, freezers, dishwashers, and portable air conditioners will have energy labels, where usage is outlined in kWh figures, smaller appliances will list their wattages on a sticker on the outside of the product called a rating label. The wattage should also be listed on the manufacturer's website in the specification section.

Appliances that use this measurement will be outlining the amount of energy that the appliance consumes in one hour's worth of usage. Every 100 watts costs 3.4p/hour to run (based on UK electricity cost of 34p/kWh).

This means that if you have an appliance that is listed as 300w (watts), then it will cost just over 10p per hour to run (3.4p x 3).

The real costs of ownership

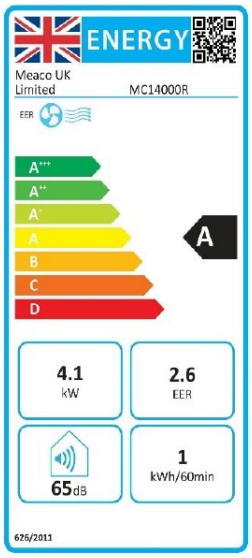
When choosing a cooling product that is the best value for money, you need to consider all costs involved, not just the initial purchase price.

For instance, DC (direct current) fans and air circulators are much cheaper to run than a traditional AC (alternating current) fan and are also much quieter.

Portable air conditioners can be energy hungry, so it is worth thinking about energy consumption when you are looking at selecting the right model for you. For example, you might choose to buy a larger portable air conditioner that will have to run for less time, rather than opting for a cheaper small air conditioner that will run for longer. Better quality large portable air conditioners also don't make any more noise than the smaller models. This means that you get much more cooling and a shorter run time, all at the same noise level. When researching portable air conditioners, look for a high rating on the energy label to keep running costs as low as possible.

Energy consumption is the invisible cost of ownership. Some products can cost hundreds of pounds a year more to run, resulting in significant sums of money spent which is hidden within your energy bill. Understanding the long-term overall costs and pros and cons of a products will help you make an informed choice based on your needs and your budget.

In addition to costs, consumers should factor in the length of warranties. If you buy a product with a shorter warranty, you could be purchasing another appliance sooner than expected. If nothing else, the longer warranty will give you peace of mind.



Through research, you will also be able to see whether products have been recognized by consumer or industry bodies, like awards, and find out what other consumers think of the product. This can help you to make a decision on whether the appliance is one of good quality and that will suit your need. Unbiased websites such as Which? can be a useful resource for this too.

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What to consider when buying a portable air conditioner or a fan

The first consideration when buying a portable air conditioner or fan is what level of cooling you are looking for.

For example, if you're finding temperatures a little warm and uncomfortable, then a personal fan may be all you need. However, if the room is very hot, then a portable air conditioner might be a better option. While fans can achieve a lot to cool you down and improve ventilation, they don't reduce air temperature. Sometimes the movement of air caused by a fan is enough, but if the temperature of the room itself is high then a portable air conditioner is a better option.

This is where portable air conditioners offer huge benefit. Cheaper and faster to set up than fixed air conditioning, a portable air conditioner can provide comfort from the heat and are a useful temporary solution in the summer.

Getting a cool night's sleep

Being able to sleep well in hot weather is a big motivator for many buying cooling products, and the level of cooling required to help you get a good night's sleep can vary throughout the year.

Sleep experts recommend optimum temperature for a restful sleep is 16-18˚C. In Britain from around April onwards, it is now often the case that this temperature is exceeded. This is especially the case in homes with bedrooms on the first floor, as heat rises from the rooms below and warm up the bedrooms. If sleep is the main driver in your cooling product purchase, then noise level will likely be a key consideration.

The table below outlines the benefits and limitations of both air circulators and portable air conditioners (PAC).

Ultimately the decision between fan and portable air conditioner comes down to function, preference, and personal budget. Whatever your choice, it is important to complete comprehensive research to ensure get the right machine for the size of your room (advice on this later in the guide), budget and requirement.

Product feature	Small air circulator	Large air circulator	Small PAC	Large PAC
Low running costs	✓	✓		
Creates airflow	✓	✓	✓	
Circulates all air in a room		✓		
Very quiet operation	✓	✓		
Portable	✓	✓	✓	✓
Battery powered option	✓			
Reduces room temperature			✓	✓
Removes humid air			✓	✓
Needs equipment to remove hot air			✓	✓
Small to store	✓	✓		

Cooling fans and air circulators

When you are choosing a fan, you likely want something that circulates the air well, operates quietly so it doesn't disturb you, and looks stylish and well designed for your home. The biggest differences are in size and whether the fan is for a surface or stands on its own pedestal.

Variations in function relate to different sized fans, which are often categorised into the following descriptions:

- Table fan
- Pedestal fan
- Tower fan

Tower fans can be less sturdy, which can mean they are unsuitable if young children are in the vicinity. Due to their design, the air comes out at a lower height. Other fans descriptions include ceiling fans, which are permanent installations in a room, and bladeless fans which are considered safer around the vulnerable and easier to clean.

Another way to differentiate fans is by their extra functions. Some will have multiple speeds to choose from, a remote control for ease of use, or perhaps a nightlight as a bonus. Several brands may also offer a temperature related modes that adjusts the fan speed automatically as the room temperature changes, or a night mode which reduce the fan speed during the night. This stops you from waking up feeling cold, as body temperature typically drops when sleeping.

When selecting a fan, it is important to consider what size would be best for your need and which functions are going to be most appropriate for your requirement.

The blades of any type of fan work by circulating the air around us and speeding up any evaporation of sweat, which provides a cooling effect. Despite not reducing the temperature of the room, the moving air will make the room feel more bearable and the air will feel cooler.

Overall, the main benefits of fans are:

- Inexpensive to buy and run (DC fans in particular) – a good quality DC fan could cost as little as 1p to run for 10 hours' use on low fan speed
- Quieter solution than portable air conditioner (especially DC variations)
- Simple to operate
- Portable, making it easy to move from room to room
- Easy to store when not in use
- Can help to dry washing indoors quickly

Standard fans tend to use an AC motor which can be noisy. This is less of a problem in large spaces with other background noises like an office, retail space or gym, however in a home office, lounge or bedroom where you might prefer a quieter environment, a DC fan or air circulator will be quieter and a better investment.

Air circulators vs. standard fans

An air circulator is a particular type of fan that has specially designed blades to move air over greater distances. The fan head itself also normally oscillates left, right, up and down to bounce the air off the walls and ceiling. This means that unlike a normal fan, all the air within the room is moving rather than creating a direct tunnel of air that is blown straight. This is far more effective and efficient, benefiting multiple people in the same room or if you don't want air blowing directly at you.

The fan head and blade of an air circulator fan will be a different shape to those in a standard fan. As the shape of an air circulator's head and fan blades move air over a far greater distance than a traditional fan, you can have the air circulator positioned further away from you and still benefit from its cooling effect. This is called the throw, and many air circulator fans have a throw of several metres.

Air circulators are becoming increasingly popular, and more widely available. When searching for the right air circulator for you, it is important to check reviews to ensure that you are buying a quality air circulator with the increased functions outlined above, and not just a traditional fan being referred to as an air circulator.

Not all fans or air circulators are created the same. The operating noise of fans can vary, and many can be cheap or low quality, costing you more over time or becoming expensive to run. Always look at the fan's oscillation capability to understand how much air it will circulate and if you're keen to purchase a quiet fan, look out for those with a Quiet Mark accreditation.

Finding the right fan for you

Deciding which is the best fan for you isn't always easy as there are many types available. When it comes to picking the right one, there are five important factors you should take into consideration.

1. **Where will you use it?**
Do you need a fan for your desk, your bedside table, the kitchen side or the sitting room? The space where you want it to sit can help to determine the size of fan that you will buy. If you only have a small space like a windowsill, or the edge of your work desk to put the fan on, then a smaller fan is likely to make more sense.

Additionally, you might be looking to move the fan from room to room, or perhaps take it out with you for the day. A portable fan running off a single USB cable or just batteries will be one to look out for.

2. **How close to the fan will you be?**
If you are going to have the fan very close to you, for example next to your head in bed or on the table next to a PC, then a smaller fan might again be better. But if you are looking to position the fan further away, perhaps in the centre of the sitting room to cool the whole family, then a larger fan would be better with its much more powerful airflow.

3. **Where will the fan sit?**
In a bedroom, you might want the fan at the bottom of the bed but have nothing to sit it on. In this case a pedestal fan would be best, as it can stand on the floor and is tall enough to keep you cool in bed. This would be the same in a lounge, but in this case make sure that the pedestal fan is tall enough to blow air over items like armchairs and sofas.

4. **Do you want night lights, or not?**
For those wanting a dim light while they sleep, whether it's for you or your child, many fans that have an optional night light can offer you a reassuring glow at night. Alternatively, many fans have the option to turn any displays and sound off entirely if you prefer total darkness and don't want to be disturbed by potential beeping.

Portable air conditioners

There are many differences to understand when considering types of air conditioning. Fixed, wall-mounted air conditioning needs to be professionally installed and once established, it cannot be moved to another room or house. In contrast, a portable unit could be easily moved. Fixed air conditioning will be quieter and more efficient than a portable one, but not as flexible. Permission might also be needed for the sighting of the external kit with a fixed model, and there may be servicing and maintenance costs.

Air coolers are also regularly mentioned alongside portable air conditioners, but they are very different machines, built for different environments. Air coolers are typically cheaper (usually under £100) and don't require a duct to push hot air out of the window. They have a water tank to soak a filter material and air is passed over the filter, then cooler humid air is pushed into the room. For an air cooler to work effectively, windows or doors open at opposite ends of the room to allow airflow to dry the air. These machines work best in arid countries but are not very effective in Britain, where we have humid summers.

Fixed air conditioning may be a good long-term solution, but the initial cost will be high, and its permanence means you need to consider any future uses of that room. The installation is very difficult and costly to remove. Portable air conditioners are a practical solution and a simpler way to trial whether you might be interested in a fixed air conditioner.

How does a portable air conditioner work?

Portable air conditioners pull in air from a room and moving it across a cold surface, which cools and removes any excess moisture from the air. Heat that is removed from the air is blown out of the room – along with the excess moisture – via a duct (normally out of a room window) and the cool, dry air is blown into the room.

On very humid days, there is a small amount of moisture that the portable air conditioner is not able to evaporate and blow down the duct. The machine collects this as water in a small internal reservoir. This is particularly common on humid days where there may be a thunderstorm.

Although the machines are bulkier and noisier than a fan, due to the power and nature of a portable air conditioner, the cooling impact on a room is far more noticeable. While they are generally more expensive to buy and run, they are a preferred choice for many in particularly hot weather.

While standard fixed air conditioning cools the air by recirculating it within the space, portable air conditioners expel the hot air outside. This increases the number of air exchanges within space and stops the air within the room from becoming stale. Due to the air exchange and ventilation, portable air conditioning makes for a safer COVID-friendly cooling solution for spaces like offices or event spaces, where people are mixing indoors.

The cooling capacity of portable air conditioners is expressed in either kilowatts (kW), or more commonly British thermal Units (BTUs). The higher the number, the more cooling power on offer. 1kW is the equivalent to 3412BTU, so a 3kW portable air conditioner would be called a 10,000BTU model (10,236BTU).

What to consider when using a portable air conditioner

The option to move a portable air conditioner from room to room provides flexibility, but naturally you can only cool one room at a time. A lot of machines have castors to enable you to move between spaces, but many find it inconvenient to move one up and down stairs regularly due to their weight and size. If you're keen to feel the benefit of air conditioning in multiple rooms without the inconvenience – to cool down many bedrooms before going to bed, for example – then you could consider purchasing multiple machines.

The positioning of a portable air conditioner needs to be considered, as each machine uses a window exhaust kit to take the warm air outside. These machines also treat the air to some extent. While they shouldn't be considered as a replacement for an air purifier or dehumidifier, a portable air conditioner helps to remove some dust particles from the air while cooling it and reducing humidity.

How much a portable air conditioner can truly reduce the temperature of a room will depend on several factors. These include:

- The starting temperature of the room
- The heat retained in the walls and fabric of the room
- The number of people in the room
- What activity is taking place in the room
- The amount of equipment running in the room
- Whether the room is facing south and getting a full sun all day
- How well insulated the room is
- How large the air conditioner is and how long it is allowed to run for

The outside walls of a room tend to act like a battery and store up energy and heat. In summer's increased temperatures, the walls get warmer and therefore the room takes longer to cool down. This is why later in summer after consistently warm weather, it takes longer to cool the room than it did at the beginning of the season.

Humans and appliances produce heat. The more a room is occupied and the more appliances that are plugged in, the higher the temperature of the room will be and therefore a portable air conditioner will need to work harder to cool down the space. Older houses with less insulation and south facing rooms that are not shaded from the sun will also warm up quicker and therefore take longer to cool with a portable air conditioner.

Finding the right portable air conditioner for you

Many people underestimate the cooling size of a portable air conditioner and can be disappointed when they find that it does not offer enough cooling for them on the hottest evenings. A bigger unit provides more cool air in a larger space and will also be quieter in comparison.

It's important to consider how much heat you want to remove to ensure the machine to purchase is fit for purpose. The size of the room that you are looking to cool will also impact the type of portable air conditioner you need.

Portable air conditioner	Room guide
7,000BTU	12 to 22m^2
8,000BTU	14 to 24m^2
9,000BTU	16 to 26m^2
10,000BTU	18 to 28m^2
12,000BTU	20 to 30m^2
14,000BTU	22 to 32m^2
16,000BTU	24 to 34m^2

A rough guide to portable air conditioning sizing

Though there are a lot of variables when it comes to room temperature and therefore the size of portable air conditioner required, below is a rough guide to room size and portable air conditioner size. This is based on average usage and amount of appliances in a room in a UK household.

How to accurately calculate the right portable air conditioner size for your need

To accurately calculate the required BTU (British thermal unit) output of your room, you would need to consider the various heat sources and add them together to determine the cooling you require.

You need to know:

1. The floor area of the room
2. The size and position of windows, and whether they have blinds or shades
3. The number of room occupants (if any)
4. The heat generated by equipment
5. The heat generated by lighting

Here we have outlined details for calculating the BTU output of your room. By following these steps and adding all the BTU figures together, you can gauge the total heat load in a space. The BTU figure will be the amount of cooling you require, and the number to look for when purchasing an air conditioner.

Floor Area of Room

Naturally, the larger the floor space of a room, the more cooling will be required. To calculate the area in square metres, and the BTU required for that space, use the below calculation.

length of room (m) x width of room (m) x 337

Window Size and Position

If the room you are looking to cool has windows, then their size and orientation needs to be considered. The calculations below can be used to identify this and combined for a window BTU figure.

South Window BTU
= South Facing window Length (m) x Width (m) x 870

North Window BTU
= North Facing windows Length (m) x Width (m) x 165

If there are no blinds on the windows multiply the result(s) by 1.5

Occupants

You need to take into account the number of people who would normally be spending time in the space. The heat output is around 400 BTU per person so the calculation to use to total the occupant BTU is below.

Number of occupants x 400

Equipment

Most heat in a room is generated by the appliances and equipment in the space. While wattage information of appliances provided is the maximum power consumption rather than the reality in every instance, using the total wattage and overestimating ensures that your calculations allow for any usage of those appliances. The equipment BTU can be defined by the following calculation.

Total wattage for all equipment x 3.5

Lighting

The information to understand the wattage of your lighting will be on your light bulbs, and the calculation below will help you identify the total BTU for your lighting.

Total wattage for all lighting x 4.25

How to keep cool for less

Whether you have a cooling product or not, there's lots you can do to stay as cool as possible in warm weather. Here are some tips for coping in high temperatures and getting the most out of any cooling products you own to keep cool for less.

Help rooms to stay cool

It's important to try to not let the room get hot in the first place, so keep windows, curtains and blinds closed throughout the day to stop the heat from the sun warming up the room. If you need to open a window to allow fresh air through the space, then only open the window when the outside air temperature is cooler than the room temperature.

If you do want some fresh air, then look to open windows and doors at opposite ends of the house or room so that you get a through breeze and you are not just increasing the temperature of the room by trapping even more hot air within the room. When you do open doors and windows keep blinds and curtains closed to prevent solar gain from heating up the room.

Pre-cool the room for bedtime

If getting a good night's sleep is your priority, then put any fan or portable air conditioner on mid-afternoon, with the blinds and curtains drawn and the door closed. Aim for an ideal bedroom temperature of around 16-18˚C (60-65˚F). Temperatures over 24˚C (71˚F) are likely to cause restlessness, while a cold room below 16˚C (60˚F) will make it difficult to fall asleep.

If you have dual aspect windows, open two windows on opposite walls once the sun has gone down and place an air circulator so that it is blowing the air out of one of the windows. This will suck the hot air out of the room, while cooler fresh air comes in from the other window resulting in a significant drop in temperature in a very short time.

Turn off electrical devices

All electrical products give off heat, so if items are not being used, turn them off. This saves money and stops the room warming up more than necessary.

Sleep cool

Consider using sheets rather than duvets in the hotter months for bedding, made from natural fibres such as cotton or linen for extra cooling. The same goes for pyjamas. If it is exceptionally hot, try placing them for a short while in the freezer before bed.

Have a warm shower or bath about 30 minutes before bedtime to relax and help your body to cool naturally. It should be warm, as taking a cold shower will push blood to your skin to warm you up.

Don't forget to keep a glass of cool water handy to keep hydrated if you wake up feeling hot and bothered.

Cool down pets

If you sleep with pets on the bed, then their body heat will make it harder to stay cool. Try putting a hot water bottle in the freezer and then place it somewhere comfortable in your bed to snuggle up to.

And for those extreme heatwave days...

If you're fortunate to own both a portable air conditioner and a fan, using both can help to cool a space down very quickly. A portable air conditioner will reduce the room temperature and a fan help to circulate that cooler air around the room faster.

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