AC 101

How it works?

An air conditioner cools your space with a cold indoor coil called the evaporator. The condenser, a hot outdoor coil, releases the collected heat outside. The evaporator and condenser coils are serpentine tubing surrounded by aluminum fins. This tubing is usually made of copper. A pump, called the compressor, moves a heat transfer fluid (or refrigerant) between the evaporator and the condenser. The pump forces the refrigerant through the circuit of tubing and fins in the coils. The liquid refrigerant evaporates in the indoor evaporator coil, pulling heat out of indoor air and cooling your home. The hot refrigerant gas is pumped outdoors into the condenser where it reverts back to a liquid, giving up its heat to the outside air flowing over the condenser's metal tubing and fins.

The two most common types of air conditioners are room air conditioners and central air conditioners. A newer type of air conditioner is called ductless, mini-split air conditioners.

- Room air conditioners
- Central air conditioners
- Ductless mini-split air conditioners

According to Energy Star, the average household spends 13 percent of its annual utility bill on cooling. So it is very important to choose the right unit. An air conditioner that's too small won't do a great job cooling a room. One that's too big cools so quickly that it doesn't have time to remove enough moisture and dehumidify your space evenly, leaving you with a cold, clammy and uncomfortable space.

BTUs:

Choosing the right BTU (British thermal unit), for your room size will make sure you get the most energy-efficient cooling system for your space.

Generally speaking, an air conditioner needs 20 Btu for each square foot of living space. To measure your room, multiply the length of the room by the width.

BTU	ROOM SIZE RANGE(sq.ft)
5,000	100~150
6,000	150~250
8,000	250~350
10,000	350~450
12,000	450~550
15,000	550~700
18,000	700~1000
22,000	1000~1400
24,000	1400~1500

But don't go by Btu alone. Energy Star recommends you make allowance for other considerations—such as the height of your ceiling, where the unit will be placed, and the size of your windows and doorways.

- If the room is heavily shaded, reduce capacity by 10 percent.
- If the room is extra sunny, increase capacity by 10 percent.
- If more than two people regularly occupy the room, add 600 Btu for each additional person.
- If the unit is used in a kitchen, increase capacity by 4,000 Btu.

A common rating term for air conditioning size is the "ton," which is 12,000 Btu per hour.

Energy Saving:
Set your air conditioner's thermostat as high as is comfortably possible in the summer. The less difference between the indoor and outdoor temperatures, the lower your overall cooling bill will be.

Recommendations from Energy Star are pretty strict: 78° F when you're home, 85° F when you're at work or away, and 82° F when you're sleeping.

To gauge a unit's energy efficiency, look for two things in the product's specifications: Energy Star rating and/or CEER number. A CEER (Combined Energy Efficiency Ratio) measurement tells you how many BTUs the unit uses for each watt of power. The higher the CEER, the more efficient the air conditioner.

Energy Star-rated room air conditioners use approximately 10 percent less energy than comparable models and save you money on utility bills. These efficient ACs also have features that give you better control over operation and energy output. These include programmable timers,

digital thermostats, and multiple cooling speeds. Most states also offer rebates for customers who purchase an Energy Star model.

Consider using an interior fan in conjunction with your air conditioner to spread the cooled air through your home without greatly increasing electricity use.

Installation Location

North-facing windows receive the least sunlight, or look for a window on another wall that's shaded by trees or another source of coverage are better installation locations. Closing curtains and blinds is another way to reduce solar heat gain. It’s also important to keep heat-generating objects, such as a lamp or TV away from the air conditioner. That’s because the unit's thermostat can sense their heat, causing the unit to run longer than necessary.

Remember that efficient operation of any air conditioning system relies on a properly insulated and air sealed home. Inspect the window seals around your unit to make sure hot air isn’t getting into the room or cold air escaping. If leaks are present, reseal around your unit with weather-stripping.

Electrical Requirements

Because window air conditioners use more power than other common household appliances, make sure your existing electrical system meets the needs of the unit's electrical requirements. Smaller room air conditioners (i.e., those drawing less than 7.5 amps of electricity) can be plugged into any 15- or 20-amp, 115-volt household circuit that is not shared with any other major appliances. Larger room air conditioners (i.e., those drawing more than 7.5 amps) need their own dedicated 115-volt circuit. The largest models require a dedicated 230-volt circuit.

ACs with cooling capacities below 15,000 BTUs usually run on standard residential (115- to 125-volt) circuits. Window ACs with cooling capacities above 15,000 BTUs usually run on 220-volt circuits. With these models, you may need to install special electrical wiring or find an electrician to assist you.

Electrical requirements, including voltage, watts, and amps, will be listed in the specifications.

Maintenance

Simple maintenance helps keep an air conditioner operating efficiently and can maximize its lifespan. Unplug the air conditioner before performing maintenance.

All room air conditioners have a filter that can get clogged with dirt and dust, which reduces airflow through the unit, reducing its efficiency and ability to clean the air. A few times a season, slide out the filter, remove debris with a vacuum then wash the filter in warm, soapy water. Let the filter dry before reinstalling it. If the filter is badly worn, it’s time to get a new one.

Wipe down the cabinet with a damp cloth and mild detergent as needed. Keep water away from the control panel and power plug.

Prepare the unit for storage over the winter according to the manufacturer's instructions.