

Home Air Conditioning



Overview

Air conditioning (A/C) and home cooling needs vary by region, home age and home energy efficiency. Whether purchasing a room A/C unit to get through a few weeks of high-summer heat or looking for a more powerful central A/C system, the key to saving energy and money is to buy a high-efficiency cooling system and to increase your home's overall energy efficiency.

How to Choose an Efficient Cooling System For Your Home

When it comes to keeping your home cool and comfortable during the hottest months – when you can break a sweat by stepping outside – you need to consider what type of cooling system is right for you, the efficiency of your cooling system and the overall energy efficiency of your home. Here are the options to make this decision:

Central Air Conditioners: If you live in a hot, humid area, your best bet is a high-efficiency air conditioner. Air conditioners are available in all shapes, sizes and efficiency levels. The first step to buying an air conditioner, heat pump or evaporative cooling system is to look for the ENERGY STAR® label. From there, check the Seasonal Energy Efficiency Ratios (SEER) rating. The higher the better, but in general, a 15 or a higher ratio is going to help you save a lot of money during the hot summers.

Evaporative Coolers: In hot and dry regions, you might be better off with an evaporative cooler. Rather than removing heat from the air to reduce the temperature in your home, an evaporative cooler pulls in air from outside, sending it through water-soaked pads. This cools the air as it moves into your home. Meanwhile, if you open some of your windows slightly, this will allow hot air inside your home to move out while the cool air moves in. These systems are two to three times more efficient than central air conditioning systems with the highest SEER ratings.

Room Air Conditioners: Mild climate dwellers who only suffer from a few spikes of high temperatures in late July and August can usually get away with having one or more energy-efficient room air conditioners.

Geothermal/Air-Source Heat Pumps: Also effective in milder climates, heat pumps can be used to both heat and cool your home. Rather than using non-renewable fuels to heat or cool air, they remove heat from the air and transfer it either into or out of your home, depending on the season.

Whole-House Fan: A whole-house fan can provide comfort in warm climates without air conditioning. With proper ventilation, they can create a wind chill within your home by sending heat out of your attic and allowing cooler air to flow in through open windows.

Decoding Air Conditioner Energy Efficiency

There are a lot of terms and abbreviations that get used when people are talking about energy-efficient air conditioners. The following is an explanation of what those terms mean and how you can apply them when searching for a new home cooling system.

SEER vs. EER: SEER and Energy Efficiency Ratios (EER) are used to rate air conditioner energy efficiency. SEER is used to rate central air conditioners and EER is used to rate room air conditioners. With both, the higher the SEER or EER number, the more efficient your system will be. Purchasing a system with a higher SEER or EER will cost more, but the extra cost for a more efficient system will easily pay for itself and more. Tax credits and rebates may be available if you purchase a more efficient system.

Heating Seasonal Performance

Factor (HSPF): Heat pumps are an alternative to central air conditioners that not only cool your home in the summer, but also heat your home in the winter. Just like an air conditioner, SEER or EER are used to rate a heat pump's cooling efficiency. Since it also has the ability to heat, heat pumps also have a heating efficiency rating called HSPF. Like SEER and EER, the higher the HSPF, the better.

Package vs. Split: Within a cooling system, there is a cold evaporator coil and a hot condenser coil. The hot condenser coil is located outdoors so it can release heat that has been removed from the air inside a home. The cold evaporator coil can be inside or outside. If it's located inside the home, the air conditioner is considered a split system and if it's outside, it's a package system. Central air conditioners are usually split systems and room air conditioners are usually packaged systems.

Sensible Heat Factor (SHF): The SHF becomes important when you live in a humid climate because it rates an air conditioner's ability to remove moisture from the air, which affects how cool the air inside your house feels. People living in humid climates should have an air conditioner with an SHF of 0.67 to 0.77. A lower SHF means that the overall efficiency of the AC will be lower, but having a living space with a humidity of less than 40 percent helps prevent respiratory problems.

Improving your Air Conditioner's Effectiveness

Home air sealing and duct sealing is extremely important if you're going to invest in a new cooling system. Inefficient or leaky ducts can waste 30 percent of the energy you are using to cool your homes. Meanwhile, if your home's "exterior shell" is leaky or poorly insulated, all of the expensive, conditioned air can seep out of your home around windows, doors and outlets. It's a good idea to work with an energy retrofit contractor who can help you bring your home up to speed before investing in a cooling system.

By insulating, air sealing and duct sealing, you may be able to buy a smaller air conditioner than you had before since it won't have to work so hard. You also may be able to reduce the amount of energy needed to keep your house cool through simple techniques like shade trees and shutters which are part of your cooling system as well! Thinking about your home as an interconnected system will save you money on the air conditioner itself, improve your overall energy efficiency, lower your utility bills and ultimately reduce your carbon footprint.