

Ductless Heating & Cooling Systems: Frequently Asked Questions

What is a ductless heating and cooling system?

Ductless systems, also known as ductless heat pumps or ductless mini-splits, are highly efficient easily installed primary heating and cooling systems for electrically heated homes. They're safe, durable and quiet; and they heat rooms evenly at a fraction of the cost of baseboard, wall and ceiling heat or electric furnaces.

Ductless systems utilize heat pump technology to distribute warm or cool air more quietly and efficiently than traditional electric heaters. With three main components (outdoor unit, indoor wall-mounted unit, remote control), ductless heat pumps are easily installed by a professional in less than a day and can reduce your electric heating costs by 25% -50% while keeping you comfortable all year long.

Where do ductless systems work best?

Replacing an existing heating system

Ductless systems are ideal for replacing or supplementing baseboard, wall and ceiling heat, wood stoves, electric furnaces and other electric plug-in space heaters, such as those using propane or kerosene. A cost-effective solution for a small electrically heated home consists of a single-zone system serving the main area of the house, with existing electric baseboards remaining in bedrooms and bathrooms.

Room additions

A ductless system provides efficient heating and cooling for a room added onto a house or an attic converted to a living space. It is an efficient alternative to extending the home's existing ductwork or pipes or adding electric resistance heaters. Please note that homes that are not primarily electrically heated may not be eligible for utility rebates; check with your electric utility for rebate eligibility requirements.

New construction

New home designs can be adapted to take advantage of a ductless system's many benefits. One or two systems can be installed in various zones of the house to simplify installation and minimize refrigerant line length. Please note that homes under construction are generally not eligible for utility rebates, although home that are complete or permitted for occupancy are now eligible for rebates from most utility territories. Be sure to check with your electric utility for rebate eligibility requirements.

How does a ductless system work and how is it controlled?

Ductless heating and cooling systems are two-way heat pumps that transfer heat between outdoor and indoor air by compressing and expanding refrigerant. Using a refrigerant vapor compression cycle, like a common household refrigerator, ductless systems collect heat from outside and deliver it inside the house on the heating cycle, and the opposite on the cooling cycle. Ductless systems use variable speed compressors with inverter technology (AC to DC) in order to continuously match the heating or cooling load. This avoids the inefficient on/off cycling of conventional electric resistance and central heating systems, which is commonly associated with uncomfortable temperature variations and high energy consumption.

Ductless systems consist of several parts, including:

- An outdoor unit that contains a condensing coil, an inverter-driven variable speed compressor, an expansion valve and a fan to cool the condenser coil
- An indoor unit that contains an evaporator and a quiet oscillating fan to distribute air throughout the living space
- A refrigerant line-set that is made of insulated copper tubing and is housed in a conduit alongside a power cable, and a condensation drain
- A remote control that can be used to set the desired temperature and program for nighttime settings; some units also have wall-mounted or Wi-Fi enabled controls

Do I still need my old heater?

While a ductless system can be used as a primary heat source, homeowners are encouraged to keep their existing electric heating units as supplementary heating in case of extreme weather conditions or for use in hard-to-reach extremities of the home.

Are ductless systems efficient?

Ductless systems are highly efficient, using 25%–50% less energy than electric zonal heaters, such as baseboard, wall and ceiling heat or electric forced-air furnaces. Three key factors account for the high efficiency of a ductless system:

- 1.** Ductless systems allow the user to control each heating and cooling zone independently, eliminating costly overheating and over-cooling common to central air systems. You no longer need to pay to heat or cool unoccupied rooms.
- 2.** While central air systems lose as much as 30% of their efficiency through air leaks and conduction in the ductwork, ductless systems distribute heat directly to each zone, resulting in 25% greater efficiency. Ductless systems use inverter-driven variable speed compressors that allow the system to maintain constant indoor temperatures by running continuously at higher or lower speeds. Thus, the system can ramp up or down without great losses in operating efficiency, avoiding the energy-intensive on/off cycling common in electric heating systems.
- 3.** Modern ductless systems have extremely good seasonal energy efficiency ratios, or SEER, between 16 and 22, and heating seasonal performance factors, or HSPF, that range from 9 to 12 or greater.

What is the difference between a ductless mini-split and a ducted mini-split?

A **ductless** mini-split moves heat into the home from the outdoor unit using refrigerant. Heat is delivered to an indoor unit (head) mounted on an interior wall and circulated throughout the zone served by that head. A **ducted** mini-split employs the same technology to move the heat using refrigerant, but the indoor head is located in unfinished space, such as an attic or crawlspace. Heat is delivered to the living area of the home via short-run ductwork and registers that serve multiple rooms from a single indoor unit. This allows for more areas to be served with one indoor head, but there are additional costs involved in running the ductwork.

How long have ductless systems been around?

Ductless heating and cooling systems were developed in Japan in the 1970s and have since become a preferred heating and cooling system throughout Asia and much of Europe. In the United States, ductless systems have been used in commercial applications for over 20 years.

How much does a ductless system cost?

The average cost of an installed ductless system with a single indoor heating/cooling head is between \$3,000 and \$5,000. Additional heads and greater heating capacities will increase the cost of the system. Other factors that will affect the cost of an installed system include manufacturer and model, geographic location, refrigerant line-set length, difficulty of installation and installer rates.

What rebates are available for ductless systems?

Many utilities in the Northwest offer their customers rebates up to \$1,500 for upgrading an existing electric heating system to a ductless system. Some also offer rebates for ducted mini-splits, multi-zone systems and central air handler mini-splits. Interest-free financing may also be available. Check with your local electric utility for details.

Federal tax credits and additional rebates

Residential energy tax credits for high-efficiency heating, cooling and water heating equipment may be available for qualified equipment. Find federal tax credits for qualified ductless systems at [ENERGY STAR®](#).

Rebates for similar technologies

In addition to rebates for ductless mini-splits, some utilities offer rebates for other mini-split heat pump technologies, including ducted mini-splits, multizone systems and central air handler mini-splits. They may also offer incentives to new construction homes and existing homes for additions that do not have ductwork (for example, bonus rooms or newly finished attics or basements).

Low-income assistance

All states have assistance programs for low-income residents. See if you qualify in [Idaho](#), [Montana](#), [Oregon](#) or [Washington](#).



Additional resources

Visit the [Database of State Incentives for Renewables & Efficiency](#) for a comprehensive list of rebates that support energy efficiency in the United States.

Will a ductless heat pump work in cold climates?

Today, every major manufacturer (along with some of the smaller ones, too) offers “extended capacity,” or cold-climate ductless heat pumps. In fact, cold-climate ductless systems are able to provide at least 80–85% of their heating “oomph” at temperatures as cold as 5 °F, making them the go-to for many HVAC contractors who work in colder areas.

If you live in an area where temperatures frequently dip below freezing and you have electric resistance heat, then a cold-climate ductless heat pump is an ultra-efficient — and comfortable — option worth looking into.

How long will a ductless system last?

With proper maintenance and care, a ductless system should perform for over 20 years. Many of the systems installed during the 1980s are still functioning well today. Check the manufacturer's maintenance guidelines for proper maintenance of your system.

What kind of maintenance does a ductless system require?

Ductless systems require basic maintenance to ensure optimum performance, although periodic professional servicing of your system is recommended. In most cases, ductless system maintenance is limited to keeping indoor filters and outdoor coils clean, and these tasks can easily be performed by the homeowner.

How do I know what size of system my house needs?

Ductless systems are sized to meet the heating and cooling needs of a home's individual zones. There is a great deal of flexibility when it comes to system sizing as one indoor unit can provide between $\frac{3}{4}$ and $2\frac{1}{2}$ tons of heating and cooling depending on its BTU capacity rating. Some common capacities for indoor units are 9k, 12k, 18k, 24k, and 30k BTU. Outdoor units are sized to meet the combined load of all heating and cooling zones. More than one outdoor unit may be necessary for multi-zone systems.

Work with a qualified ductless installer to make sure you are getting a properly sized system for the heating and cooling needs of your home.

How can new homes incorporate ductless systems into their design?



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