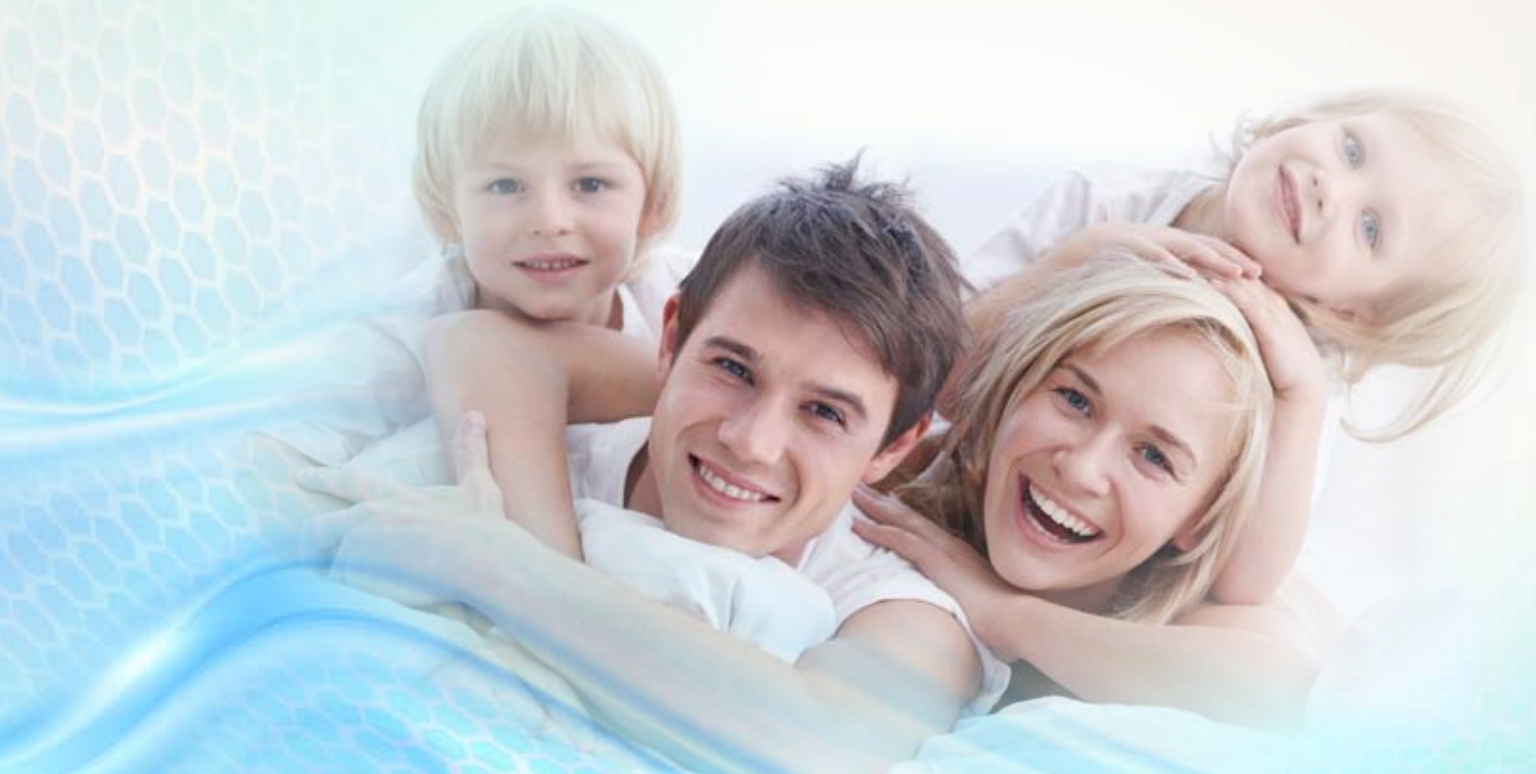
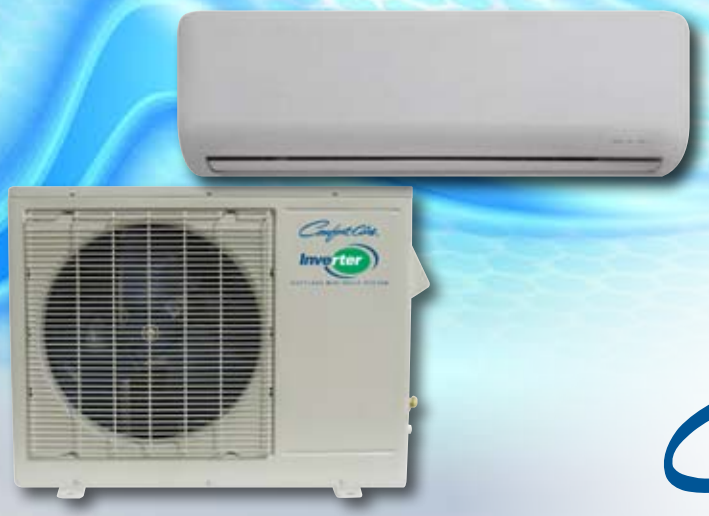
DUCTLESS MINI-SPLIT SYSTEMS

Comfort. . .

where you need it, when you need it





MARS® Delivering Confidence

Comfort-Aire®

Ductless mini-Splits

THE COMFORT SOLUTION

Ductless mini-split systems are a great solution to a wide variety of installation challenges, giving contractors the ability to add cooling and heating in locations that previously seemed impossible. They're ideal when installing ductwork is difficult, prohibitively expensive, or simply impractical. Residential and commercial structures, new construction and existing buildings, are candidates for mini-splits.

Basically a mini-split does away with the need for ductwork. Like a regular split system A/C or heat pump, the condenser is located outdoors; one or more air handlers are placed indoors. The two are connected by electrical, refrigerant, and condensate drain lines that run through a small hole in an exterior wall, generally 3" in diameter or less.

In addition to eliminating the need for ducting, one of the other big advantages of mini-split systems is true zone control. The air handler is dedicated to the room being conditioned and is controlled by a wireless remote. That room can be kept at a temperature and humidity level different from the rest of the house or building.

Multi-zone systems for up to five rooms (or one large space) feature a single condenser that handles one, two, three, four or five air handlers. Each air handler is independently controlled, with its own remote and electronic-based climate controls to regulate temperature and humidity levels, as well as air flow. Units in a bedroom and a home office, for instance, can be programmed for different hours of operation with the 24-hour timer, or two classrooms situated side by side can be set at different temperatures. (although units cannot operate in heating and cooling modes simultaneously).

Mini-split systems have the flexibility to fit virtually anywhere and with SEER ratings up to 23.5, they're also economical to operate.

WHERE CAN YOU USE A MINI-SPLIT?

Common applications include:

- Historic homes (*the aesthetics of the exterior are maintained*)
- Homes with hydronic heat
- Residential additions such as a sunroom or bedroom
- Rooms with inadequate heating and/or cooling
- Vacation homes and cabins
- Schools (*individual classroom control*)
- Church sanctuaries and fellowship halls
- Nursing homes and hospitals
- Restaurants
- Remote offices such as those inside a warehouse or factory
- Utility transfer stations
- Arena sky boxes
- ATMs and office lobbies

There's more to comfort

THAN JUST TEMPERATURE. . .

MINI-SPLITS AND INDOOR AIR QUALITY

According to the EPA, the air inside our homes is often more polluted than outside air. What's needed to protect yourself from airborne contaminants is a high quality filtration system, and that's just what you get with all ductless mini-splits from Comfort-Aire.

In fact, our high wall mount indoor units are equipped with a superior filtration system. The nano silver ion filter releases silver ions that eliminate bacteria in the air, while the gold fin coating on the evaporator itself inhibits the growth and spreading of bacteria into the living space. Ceiling cassettes also have a special evaporator coating to prevent the breeding and dissemination of airborne bacteria.

Additionally, the units can be operated in the dehumidification mode without cooling or heating. This removes excess humidity from the indoor air, one of the keys to preventing the growth of mold, mildew and other contaminants.

Advantages of an inverter ductless mini-split system

Quiet Operation—The indoor air handler is "library quiet," operating so quietly you may not realize it's on, because the compressor operates at low frequency most of the time with no on/off cycling and the fan delivers balanced airflow

Easy Installation—All it takes to connect the outdoor condenser and the indoor air handler is a hole about 3" in diameter to run refrigerant lines, condensate drain and electrical wires between the two components

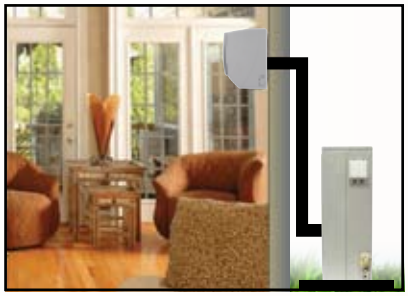
Efficiency—Units are designed to be energy efficient with high SEER ratings that meet or exceed government mandated standards; and only the room or area being used is conditioned, potentially decreasing electricity usage when compared to traditional systems

Attractive Appearance—High wall models feature a low profile indoor unit in a clean white finish that blends with any décor; ceiling cassettes have a white panel that virtually disappears in ceiling installations

Security—With a room air conditioner, there's always the worry that access to the home can be gained through the window where the unit is mounted; that worry is eliminated with a ductless system

Consistent Comfort—Electronic climate controls regulate operation to maintain a preset temperature level; auto swing airflow continually adjusts the air direction for a gentle, breeze-like effect preferred by most people; auto mode adjusts the temperature and fan speed to maintain the setpoint you've selected

Simple Operation—One fully featured remote is included for each indoor air handler or ceiling cassette, making it simple to select the mode, set the temperature and the timer, and change the airflow direction; ceiling cassettes also come with a wired wall-mount thermostat.



This diagram shows a typical high wall mount installation:

- The condensing unit is installed outdoors while the air handler is mounted inside on an exterior wall. A hole approximately 3" in diameter is drilled through the wall. The lines that carry refrigerant from the air handler to the condensing unit and back run through this hole.
- A communication wire runs between the two components: power is supplied by the outdoor unit so there are no cords and plugs visible on the interior. A bracket mounted to the wall supports the high wall mount air handler.
- A drain line runs from the air handler to the outside to carry away condensate.

Ductless mini-splits can save you money when it comes to adding on to your house. If your current HVAC system is correctly sized for your existing structure, it may not have the capacity to handle the new square footage. Rather than replacing the entire system, you can cool and heat your new space with a mini-split—and save the cost of installing ductwork.

HOW DOES A MINI-SPLIT WORK?

Cooling without Ductwork

A ductless mini-split air conditioner works the same way central air conditioning does with one big difference—there's no ductwork.

Both the central system and the mini-split can be classified as split systems because they consist of an outdoor condensing unit and an indoor air handler/evaporator. With a central A/C system, the indoor components include a cooling coil and an air handler (the furnace's blower or a separate air handler) that circulate the conditioned air throughout the structure by way of the ductwork.

The mini-split indoor unit functions as both the indoor coil and the air handler, delivering conditioned air directly into a single room without sending it through any ductwork.

Heat Pump Models

A heat pump mini-split operates in basically the same manner, but adds heating capability. In the summer it transfers heat from inside the home to the outdoors. A reversing valve makes it possible for the unit to reverse this procedure during cold weather, absorbing heat from the outdoors and transferring it indoors to warm the space (yes, there is warm air outside, even when it's below freezing).

Heat Gain/Loss

One of the advantages this "ductless" operation provides is efficiency. In a central system, the cooled air absorbs heat as it travels through the ductwork. The longer the duct run, the greater the temperature gain. In winter, heat can also be lost as the conditioned air travels through the ducts.

Don't forget that it takes air pressure to move the conditioned air through the ducting system and that involves some noise from the fan and the actual movement of air. A mini-split system, however, is ultra-quiet because it doesn't have to push the warm or cool air through many feet of ductwork.

Inverter Technology:

'CRUISE CONTROL' FOR YOUR MINI-SPLIT SYSTEM

All Comfort-Aire mini-splits use inverter technology to maximize comfort by reducing temperature fluctuations while saving an estimated 40% or more on energy consumption, compared with traditional mini-split systems.

An inverter is an electrical device that varies the frequency of the power going to the compressor. This allows the compressor to adapt its power output to precisely match the load requirement.

You might say it's like the cruise control on a vehicle. The inverter-driven compressor automatically adjusts its speed to quickly reach and then maintain the set point. When maximum capacity is not needed, the compressor speed decreases—and with it, the power needed also decreases, resulting in improved energy efficiency.

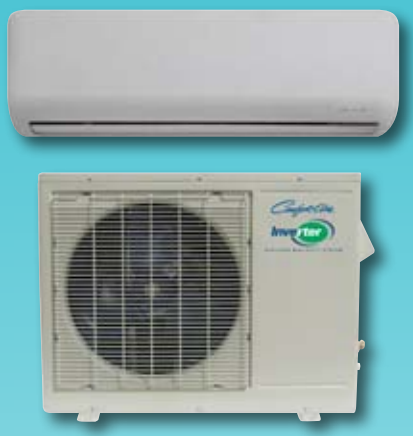
Indoors one or more air handlers are equipped with temperature sensing devices. The inverter reacts to both indoor and outdoor temperature fluctuations, constantly adjusting the compressor speed to match the demand for cooling or heat. When the outdoor condenser fan runs, its speed matches the need for heat rejection.

Highly accurate sensors also allow one compressor to meet the demands of multiple indoor zones. The inverter-driven compressor will operate at the speed necessary to maintain the set temperatures of up to five zones.

Once the set point is reached, the system "cruises along," keeping the temperature constant, but responding if the demand changes.

Compare this to a conventional mini-split which cools or heats by running the compressor until the setpoint is reached and then turns off, turning on again when the temperature falls below the setting. This on-off cycling results in temperature fluctuations that affect comfort, and also adds to wear and tear of the components, similar to the effects of driving in stop-and-go traffic.

Temperature isn't the only contributor to comfort: humidity is critical. Dehumidification, especially during hot, muggy weather, is an integral component of cooling. When the compressor in a conventional system cycles off, dehumidification also stops. With an inverter system, excess moisture in the air is removed all the time because the unit runs constantly, even when it's running at low frequency—or "economy" speed.



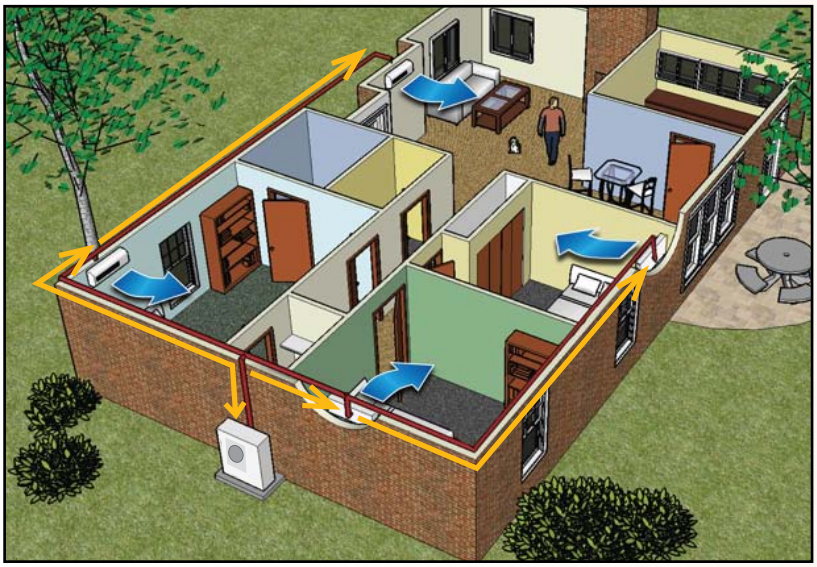
Advantages of Inverter Technology

- Reaches the desired temperature quickly
- Provides precise temperature control and continuous dehumidification (cooling mode)
- Extends component life by eliminating on-off cycling
- Operates exceptionally quietly because the DC compressor runs mostly at low speed, which also reduces any vibration and associated noise
- Saves energy by matching the compressor speed to the demand; rated at up to 23.5 SEER
- Delivers extra heating capacity even at low ambient temperatures

Multi-Zone

INVERTER FLEXIBILITY

InverterFlex®



You can see how one outdoor condenser is used in conjunction with multiple indoor air handlers in a single structure. Air handlers can be installed up to 82' (depending on model) from the condenser, so you can place the condenser in the best location for your landscaping.

For high wall mount

Operation is controlled by a fully featured wireless remote. Intuitive design makes it easy to select the operational mode. For multi-zone units, one remote is included for each indoor unit.

For ceiling cassette

When you need to condition more than one space, it's not necessary to install separate systems. You can choose multi-zone models that let you cool and heat multiple rooms, and with our InverterFlex models, you can mix and match 1 to 5 air handlers to best match your room requirements. Each system uses one outdoor condensing unit tied to multiple indoor units, and each of the indoor units is independently controlled to meet specific comfort requirements.

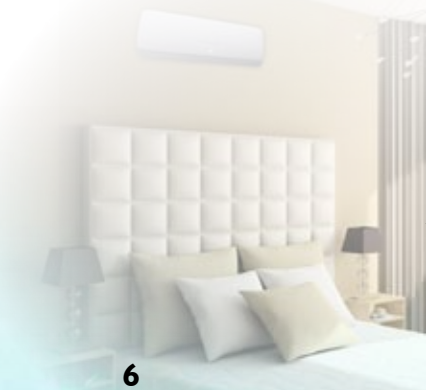
InverterFlex units make zoning practical and economical. No complicated systems and controls are required to cool and heat individual rooms. Setting the desired comfort level is a snap, using the wireless remote that comes with each indoor air handler.

This makes multi-zone mini-splits ideal not just for residential use, but also for nursing homes, classrooms, anywhere individual comfort control is preferred. Also, high wall mount and ceiling cassette air handlers can be mixed for installation flexibility.

The multi-zone design is also ideal for large spaces. One or more InverterFlex systems can be effective (and quiet) for a church sanctuary or fellowship hall, school commons area, even a warehouse setting, for example. As with all mini-splits, there's minimal disruption for installation and the sleek indoor units blend into the décor.

As for operating costs, the units use inverter technology for efficiency, but you may choose to heat/cool only the room or space being used, as needed, saving even more on utility bills.

Capacities for InverterFlex models range from 18,000 BTUH to 42,000 BTUH, with indoor air handlers sized from 9,000 to 24,000 BTUH per zone, depending on the model selected.



A ductless mini-split can contribute to a better night's rest by making your bedroom more comfortable. Not only can you control the temperature and humidity levels separately from the rest of the home, but you can also select Sleep Mode, if desired. This mode is programmed to automatically adjust the temperature during the night to coincide with the natural thermo-regulation process of the typical human body, maintaining comfort throughout the sleep period.

Mini-Splits:

ARE PACKED WITH COMFORT FEATURES

Ultra-Quiet Operation
Balanced air flow that's so quiet, you may not realize the unit is turned on; in most modes you can set the fan to the low setting for quietest operation, unlike central systems where the fan is either on or off

Attractive Appearance
The low profile of wall mount indoor units, along with sleek grille design, results in an attractive, unobtrusive installation; outdoor units can be installed close to the building to preserve landscaping and exterior appearance

Auto Swing
The unit automatically moves the louver direction for a natural breeze-like effect that is preferred by most people; can be selected in most modes

Airflow Direction Control
The vertical louvers can be set for desired airflow direction

Enhanced Filtration
Nano silver filter in high wall mounts helps improve indoor air quality: the filter releases silver ions that eliminate bacteria in the air. Special evaporator coatings on both high wall mount and ceiling cassettes prevent the breeding and spreading of bacteria

Auto Restart
The unit resumes operation when power is restored after a temporary outage, reverting to the last-used setting

24-Hour Timer
Turns the unit on and off during the day for comfort when you're home and energy savings when you're away

Low Ambient Operation
All high wall mini-splits can operate when the outside temperature is as low as 5°F without installing a separate low ambient kit

Environmentally Friendly Refrigerant
All Comfort-Aire mini-split systems use R-410A which does not contribute to depletion of the earth's vital ozone layer

Self-Diagnostics
Makes it easy to identify any operational problems

All features not available on all models: see individual spec sheets for specific features.

You can operate Comfort-Aire mini-splits in a variety of modes to suit your needs and your personal comfort level:

- **Auto Operation**—Climate controls sense the temperature in the room and adjust the fan speed and operation as needed to maintain the desired temperature
- **Cooling Mode**—Choose this mode when cooling is needed
- **Turbo Mode**—To quickly bring the room to the desired temperature, the fan operates at super high speed until the setting is reached
- **Heat Mode**—For heat pumps, the condenser extracts heat from outside air for economical comfort, even in low ambient conditions
- **Dehumidification Mode**—The unit automatically adjusts the air flow and temperature setting according to current room conditions for comfort even in the most humid conditions
- **Auto Sleep Mode**—Because our body temperature cools down as we sleep, the unit automatically adjusts the setting for all-night comfort
- **Air Circulation**—The fan circulates air without heating or cooling and can be set at low, medium or high speed

WHAT DO WE MEAN BY ENERGY EFFICIENCY?

In recent years, heating and cooling manufacturers have made significant advances in the efficiency of their systems in terms of energy usage. This is an especially important purchase consideration as fuel prices continue to rise.

Cooling efficiency is measured by a Seasonal Energy Efficiency Ratio (SEER) rating. The higher the number, the more efficient the equipment. All Comfort-Aire systems exceed the federally mandated ratings, and the VMH Series is rated as high as 23.5!

For heat pump models, efficiency is shown by a Heating Season Performance Factor (HSPF). This is an estimate calculated by dividing the seasonal heating output by the seasonal power consumption in watts. The most efficient heat pumps have an HSPF between 8 and 10. Our units are rated as high as 10 in the VMH Series.

All heating and cooling equipment comes with an Energy Guide label which shows the estimated energy usage—you can use these labels to compare equipment efficiency. Your dealer can help you determine which system is best for you, taking into account a number of factors including the average number of yearly cooling and heating days in your area of the country, in addition to your individual needs.

All Comfort-Aire mini-splits are pre-charged with R-410A, an environmentally friendly refrigerant.

READY TO BUY? HERE'S SOMETHING TO CONSIDER

Comfort-Aire offers a full line of ductless mini-split systems that are quality constructed and energy efficient to keep your family comfortable throughout the year. With single zone, multi-zone, and ceiling cassette models, there's a system in the size and type you need to add comfort to just about any location. All our mini-splits are backed by strong warranty coverage and after-sales support. Ask your dealer for recommendations on which models best suit your needs and lifestyle.

Delivering Confidence

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Comfort-Aire®