




# DUCTLESS MINI SPLIT

— BUYER'S GUIDE —





## DUCTLESS MINI SPLIT BUYER'S GUIDE



The production of this guide is aimed at helping consumers learn about the ductless mini split system, understand what makes it as a powerful alternative to traditional air conditioners, and eventually make the right purchasing decision.





# TABLE OF CONTENTS

**01****INTRODUCTION****02****OVERVIEW: DUCTLESS MINI SPLIT AIR CONDITIONER**

- What is a Ductless Mini Split System?
- How Does a Ductless Mini Split Work?
- Is Ductless Mini Split a New Technology?
- What's the Idea Behind the Ductless Mini Split Innovation?
- What Makes Ductless Mini Split a Unique System?
- What Does It Mean When We Say a Mini Split is a Reversible System?
- Can You Use Mini Split Year-round?
- In What Sense a Mini Split System More Advanced than the Conventional Systems?
- What Makes Mini Splits a Low-cost, Versatile, and Easy-to-install System?
- Can a Mini Split Maintain Its Performance Even During Extreme Weather Condition?
- What Are the Mini Split's Different Control Options?

**03****LIFESPAN AND DURABILITY OF A MINI SPLIT UNIT**

- How Long Will Your Mini Split Last?
- What are the Factors that Affect the Durability and Lifespan of Your Mini Split Unit?

**04****AESTHETICS OF A DUCTLESS MINI SPLIT**

- Is a Ductless Mini Split Unsightly?
- Can You Conceal the Mini Split's Air Handler?

**05****BENEFITS OF USING A MINI SPLIT SYSTEM**

- Why Choose a Ductless Mini Split System for Your Home?
- Why Is Mini Split a Better Alternative to Traditional Cooling/Heating Systems?
- What are the Main Advantages of a Ductless Mini Split System?
- What Particular Issues Does a Mini Split Resolve?

**06****ENERGY-EFFICIENCY RATINGS**

- What Does the Energy Efficiency of Your Mini Split Mean?
- What are the Energy Efficiency Ratings?
- What is Seasonal Energy Efficiency Ratio (SEER)?
- What is Energy Efficiency Ratio (EER)?
- What is Heating Seasonal Performance Factor (HSPF)?
- Why Understanding the Energy Efficiency Ratings Matters?
- Who Sets these Energy Efficiency Ratings and Why?
- What are the Minimum SEER in the United States?
- What Do You Get from a Cooling/Heating Unit with a High Efficiency Ratings?

**07****MINI SPLIT BASIC CONFIGURATIONS: SINGLE-ZONE AND MULTI-ZONE**

- What is Ductless Mini Split Zoned Cooling/Heating?
- How Does Zoned Cooling/Heating Work?
- What are Your Zoning Options?
- What is a Single-zone Cooling/Heating?
- What is a Multi-zone Cooling/Heating?
- What are Your Outdoor Unit and Indoor Unit Choices?
- What are the Main Differences between Single-zone and Multi-zone Cooling/Heating?
- When Does a Single-zone Cooling/eating Work Best?
- When Does Multi-zone Cooling/Heating Work Best?
- What are the Benefits of Zoned Cooling/Heating?
- Single-zone or Multi-zone: Which One is the Best Choice for Your Home?



## 08 DUCTLESS MINI SPLIT AS A SMART AC SOLUTION

- What are the Smart Capabilities of a Mini Split System?
- What are the Smart Functionalities and Control Options that Are Built in a Mini Split?

## 09 SOUND LEVEL OF A DUCTLESS MINI SPLIT

- Are Ductless Mini Split Systems Among the Quietest Cooling and Heating Solutions?
- What Makes Mini Splits Quieter than Traditional Air Conditioners?
- Why is it Essential to Have a Quiet Air Conditioner?

## 10 CHOOSING A DUCTLESS MINI SPLIT

- How to Find the Right Information About the Perfect Mini Split for Your Home?
- 2 Essential Elements that You Should Be Looking for in a Mini Split
- 5 Things to Keep in Mind When Choosing a Mini Split
- 2 Things That Should Influence Your Purchasing Decision

## 11 SIZING YOUR MINI SPLIT

- Why Should Your Mini Split Unit Be Properly Sized?
- What Does “Size” Mean When It Pertains to Air Conditioners?
- What Happens If You Use an Oversized Mini Split?
- What Happens If You Use an Undersized Mini Split?

## 12 FINDING AN INSTALLER/HVAC CONTRACTOR

- How to Find a Good Installer?
- What Should You Be Looking for When It Comes to Hiring an HVAC Contractor?
- How to Effectively Compare Bids from Contractors?
- Why It’s Important to Call the Contractors’ References?
- What’s the Best Way to Evaluate the Installer Before and After the Job?

## 13 DUCTLESS MINI SPLIT: PRICE, COSTS, AND SAVINGS

- How Much Does a Ductless Mini Split Air Conditioner Cost?
- What are the Factors that Affect the Cost of a Mini Split Air Conditioner?
- How Much Would It Cost You to Install a Mini Split System?
- What Factors Affect the Cost of Your Mini Split Installation Project?
- Why It Pays to Invest in a High efficiency AC like Ductless Mini Split?

## 14 RECEIVING YOUR MINI SPLIT SHIPMENT

- How to Accept a Freight Shipment?
- How Much Time You’re Allowed to Inspect the Shipment?
- How Should You Prepare for a Curbside Delivery?
- How Can You File a Claim?

## 15 PREPARING FOR INSTALLATION

- Why It’s Best Not to Schedule an Installation Until Your Mini Split is Delivered?
- What Are the Things that You Should Prepare Prior to the Installation?
- What You Should Ask from Your Contractor?

## 16 INSTALLING A DUCTLESS MINI SPLIT SYSTEM

- When is the Best Time to Install a Ductless Mini Split System?
- What are the Essential Tools that You Might Need for a Mini Split Installation?
- What are the Safety Precautions and Important Considerations When Installing a Mini Split?
- How is Mini Split Installed?
- Why Hiring an HVAC Contractor Remain Your Best Option?



## 17 MINI SPLIT MAINTENANCE

- What are the Basic Ways to Properly Maintain a Mini Split Unit?
- Why You Should Regularly Clean Your Mini Split Unit?
- What You Should Do Before Cleaning a Mini Split Unit?
- What Cleaning Materials Should You Prepare or Buy Before Cleaning a Mini Split?
- How to Clean the Outdoor Compressor/Condenser Unit of a Mini Split?
- How to Clean the Indoor Air Handler Unit of a Mini Split?

## 18 AIR FILTERS OF A MINI SPLIT

- Where Can You Access Your Mini Split's Air Filters?
- Why Are the Air Filters Important?
- What are the Different Types of Air Filters?
- In What Aspects Do Air Filters Differ?
- How Can You Measure or Determine the Efficiency of an Air Filter?
- How Does MERV Helps?
- How to Choose the Air Filter with the Best MERV?
- Why Having a Good Air Filter Inside Your AC is Important?
- How Do Mini Splits Stand Out When It Comes to Air Filters?

## 19 DUCTLESS MINI SPLIT COMMON ISSUES AND SIMPLE TROUBLESHOOTING TIPS

- What to Do When the Unit Wouldn't Turn On?
- Are There Any Other Causes of Your Unit's Failure to Power On?
- Why Does Your Unit Emits Foul Odor?
- What Should You Do If Your Unit Emits Foul Odor?
- How to Prevent Your Unit from Emitting Foul Odor?
- What to Do if Your Unit Generates Abnormal Noise When in Operation?
- What's the Likely Reason if Your Unit is Not Blowing Enough Conditioned Air?
- What Should You Do if Your Unit is Not Blowing Enough Cool Air?

## 20 SAVING ENERGY

How to Save Energy from Using Your Unit?





# INTRODUCTION

As evolving demands for maximum efficiency and comfort drive recent massive advances in air conditioning technology, ductless mini split system has been noticeably popular in recent years.

Seen as one of the most innovative alternatives to traditional cooling and heating systems, the ductless mini split system uniquely resolves the common issues that are typically attributed to window air conditioners and central air conditioning systems.

With traditional HVAC systems, many issues such as temperature inconsistencies, inefficient use of energy, noisy operation, poor air quality, inability to eliminate humidity, inflexibility, complex installation procedures, not being eco-friendly, costly maintenance requirements, and weak system performance among many other things have become normal concerns.

The traditional AC systems—despite the introduction of newer technologies—leave much to be desired and often seen taking away the most fundamental benefit that a modern air conditioning system is supposed to be providing—maximum performance for comfort, lower energy-consumption, and higher money-savings.

And most importantly, as comfort, cost, and energy-efficiencies become the primary requirements when looking for an air conditioner, a demand for real control over temperature has immensely grown over the years. Essentially, it means control over the things that really matter—control over the exact temperature that you need; control over the amount of energy that you consume; and control over the money-savings that you wish to earn. Unfortunately, the traditional systems that many have been used to have, are not exactly living up to the billing except generating higher energy bills.

Amidst the new demands in air conditioners, a relatively new technology has emerged at the fore—ductless mini split systems. Where many types of traditional AC systems fail, a ductless mini split solution effectively delivers.

It is hoped that as a mini split user, this guide will help you gain a full understanding of the mini split system and eventually maximize its advantages.





# OVERVIEW: DUCTLESS MINI SPLIT AIR CONDITIONER

## WHAT IS A DUCTLESS MINI SPLIT SYSTEM?

As its name implies, a ductless mini split system is a type of cooling and heating system that is:



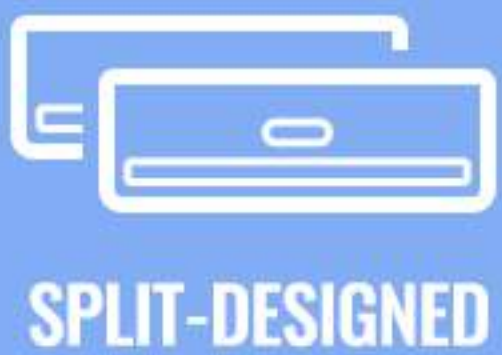
**DUCTLESS**

It doesn't use or require ductwork. Think of a system that does away with all those bulky network of solidly fabricated tubes that run through your home's ceiling, walls, or even floors and routed through different parts of your home if you are using a central air conditioning unit, a baseboard heater, or a radiator system. With ductless mini split, you can ditch these ducts for good.



**MINI-SIZED**

It is compact, which means it is designed small but performs just as good as any other system. Comparatively, it is actually more powerful, energy-efficient, versatile, cost-saving, and environment-friendly than any other type of traditional system.



**SPLIT-DESIGNED**

The term "split" refers to the way a ductless mini split is designed with two separate but interconnected components—an outdoor compressor unit and an indoor evaporator unit which functions as an air handler. If you're wondering why most traditional ACs, like a window-type unit, are noisy and clunky, it's because these systems are built with the compressor and the air handler packaged in one single unit. With a ductless mini split, you have a system in which the typically noisy compressor unit is placed outside the house. What you're installing inside is a compact, highly unobtrusive air handler.

## HOW DOES A DUCTLESS MINI SPLIT WORK?

A ductless mini split system is a reversible AC system, which means that it can work as an air conditioner or as a heat pump. It can cool or heat your room depending on your needs or desired mode of operation.

As an air conditioner, the mini split system absorbs the warm air inside the room where the unit is installed, processes it into a cool air, and then circulates it back inside the room as a conditioned air which is distributed through the air handling unit.

As a heat pump, the system takes warm air from outside through the outdoor unit. This air is brought inside and eventually distributed throughout the room through the air handling unit and with the aid of the unit's fan system.



## IS DUCTLESS MINI SPLIT A NEW TECHNOLOGY?

As a system, a ductless air conditioner is not new. While it has only recently gained popularity in the United States, it has long been popularly used in Asia and Europe since its early introduction in the 1970s. But technology-wise, the current generation of mini splits today is considered as among the most advanced air conditioning systems available. In fact, the ductless mini split system stands out as one of the very few highly significant innovations in air conditioning technology that continues to create huge impact in the way air conditioners are developed.





## WHAT'S THE IDEA BEHIND THE DUCTLESS MINI SPLIT INNOVATION?

The ductless air conditioner was conceptualized as an upgraded version of a window air conditioning unit, with the original developers hoping that it would provide ways to offset the latter system's limitations. Today, a ductless system is proving not only as the most efficient and better alternative to room air conditioners but also as a best supplement to any existing centralized HVAC system.

## WHAT DOES IT MEAN WHEN WE SAY A MINI SPLIT IS A REVERSIBLE SYSTEM?

It means a mini split can cool or heat your home, either as an air conditioning system or as a heat pump. This unique feature makes it one of the most cost-effective and versatile comfort solutions. Although you can use a mini split as a complementary system, it is also best to use as a standalone system, whether you want to cool/heat a single room or the whole house.

## IN WHAT SENSE A MINI SPLIT SYSTEM MORE ADVANCED THAN THE CONVENTIONAL SYSTEMS?

Most mini splits bring exceptional capabilities through a range of highly advanced features and components—from the powerful compressor and air handlers to highly intuitive controls. These assure you of maximum comfort experience through superior performance from a superior comfort solution.

## CAN A MINI SPLIT MAINTAIN ITS PERFORMANCE EVEN DURING EXTREME WEATHER CONDITION?

Whether it's freezing cold or scorching heat, many highly advanced mini splits can give you comfort just the same. In the case of mini split heat pumps, they actually have superior thermal performance, enabling you to consistently enjoy warm comfort even during extreme cold climate conditions.

## WHAT MAKES DUCTLESS MINI SPLIT A UNIQUE SYSTEM?

The ductless mini split system offers the kind of powerful performance, efficiencies, and versatility that you would normally find lacking in other systems, whether it's a window-type unit or a central air conditioning system. Its high-degree of energy-saving capabilities and features, coupled with its structural and operational flexibility to any cooling or heating applications makes it one if not the best alternative to traditional systems.

## CAN YOU USE MINI SPLIT YEAR-ROUND?

Most mini splits are inverter-driven, which makes them more efficient in cooling/heating your home no matter the weather or the season. This ensures you a consistent year-round comfort.

## WHAT MAKES MINI SPLITS A LOW-COST, VERSATILE, AND EASY-TO-INSTALL SYSTEM?

Unlike traditional systems, a mini split is very easy to install because it doesn't require the bulky and often costly ductwork. You can practically install it anywhere, which makes it a cost-effective, highly versatile alternative, especially if you have some complex application or specific cooling or heating issues that you can't easily tackle using the traditional systems.

## WHAT ARE THE MINI SPLIT'S DIFFERENT CONTROL OPTIONS?

When it comes to remote controllers, you can have two options: handheld or wireless remote controllers. Some advanced mini split systems also offer connectivity with smart mobile devices. This means that you can now easily control your ductless mini split system or manage your whole-home ductless HVAC system directly from your smart phone, tablet, or any smart mobile device where a specific app is installed.





# LIFESPAN AND DURABILITY OF A MINI SPLIT UNIT

## HOW LONG WILL YOUR MINI SPLIT LAST?

Ideally, ACs like a mini split can last up to 12-15 years. A properly maintained ductless mini split can even stay functional up to 20 years.



## WHAT ARE THE FACTORS THAT AFFECT THE DURABILITY AND LIFESPAN OF YOUR MINI SPLIT UNIT?

There are many factors that affect the performance and overall lifespan of your mini split unit. It could be the typical wear-and-tear, age of the system, extreme climate in the area where you live, improper use of the unit, or lack of maintenance.

# AESTHETICS OF A DUCTLESS MINI SPLIT

## IS A DUCTLESS MINI SPLIT UNSIGHTLY?

There are some concerns about the mini split's air handler being exposed in the wall. But does this make the system unsightly? The truth is, a mini split system is probably one of the most unobtrusive units that you can use in a room. In fact, the latest generations of mini splits are designed to blend with the surrounding environment.

The mini split air handlers are available in different sleek, contemporary designs, which is intentionally made to adapt to various applications and space requirements. Although most of the mini split brands that you can find today come with different designs, they still have common qualities—sleek, stylish, space-saving, flexible, and unobtrusive.

## CAN YOU CONCEAL THE MINI SPLIT'S AIR HANDLER?

Yes. In fact, it can be easily concealed due to its size and flexibility. So, if the appearance of your mini split remains an issue, here are the three ways that you can do to disguise or hide the system's indoor unit.

- Recess the unit.
- Hide it in a cabinet or shelf.
- Use a decorative cover or grille.

While these methods are effective, make sure that the airflow is not restricted so it would not impact the level of air distribution, and consequently, your comfort experience. Also, if you create a small cavity in the wall where you will insert the unit, make sure that the space has sufficient clearance. For the outdoor unit, a decorative grille might also work. It will not only hide the unit but will also protect the compressor system.





# BENEFITS OF USING A MINI SPLIT SYSTEM

## WHY CHOOSE A DUCTLESS MINI SPLIT SYSTEM FOR YOUR HOME?

Maximum comfort, high energy-savings, and total convenience are just three of the many reasons why a ductless mini split system is a smart choice. A mini split system is a great alternative due to certain reasons, such as the following:

As we currently face greater challenges in space cooling and heating, the traditional climate control systems are severely found wanting.

High energy costs, installation complexities, temperature inconsistencies, operational inconveniences, and high environmental impact make up some of the major issues that are associated with traditional cooling and heating systems.

Energy-efficiency, powerful performance, cost-savings capability, flexibility, user-convenience, and environmental-friendliness emerge as the major considerations when choosing a new climate control system.

Our temperature needs are highly influenced both by the changing natural climate conditions and the evolving people's lifestyle at home or in business environments.

The limitations posed by the traditional AC systems have spurred a greater demand for a cost-effective, energy-efficient, and a highly flexible solution that will enable us not only to achieve our desired comfort but will also allow us to gain energy-savings, reduce our carbon footprint, and experience better control over our comfort.



## WHY IS MINI SPLIT A BETTER ALTERNATIVE TO TRADITIONAL COOLING/HEATING SYSTEMS?

Let's face it—the traditional cooling and heating systems are not perfect. Whether you are using a window air conditioner, a portable unit, a gas heater, or a centralized air conditioning system, there's always a time when your conventional cooling and heating solution at home is not meeting your exact needs. The ducted systems, for instance, are oftentimes proving not too efficient and effective enough.

Impressively tackling the modern cooling and heating challenges, the mini split system is creating a new awareness in the efficacy of a ductless solution. In a nutshell, a ductless mini split system effectively creates new opportunities for whole-home climate control, delivers higher energy efficiencies, and provides powerful cooling and heating. Essentially, a cost-effective, easy-to-install mini split gives you more than just the chance to ditch the costly ducts.

## WHAT ARE THE MAIN ADVANTAGES OF A DUCTLESS MINI SPLIT SYSTEM?

A ductless mini split system offers a lot of advantages that you would not normally get from other conventional comfort solutions, like a central AC system. These exceptional benefits include the following:

Powerful cooling/heating	Easy installation
Versatile applications	High energy-efficiency
Capability to provide comfort even during extreme weather condition	
Smart controls	Remote access and management
Quality indoor air due to advanced filtration technology	
Secure and reliable as a system	
Low-noise operation that adds to convenience	
Unobtrusive design which makes it ideal to any home environment regardless of style	
Environment-friendly due to recyclable components and use of non-ozone-depleting refrigerant R410A	



## WHAT PARTICULAR ISSUES DOES A MINI SPLIT RESOLVE?

With a mini split system, you'd be able to avoid the following:

- **Costly and complex installation.**

As a ductless system, mini splits do not require the ductwork that makes the installation complex, and oftentimes, very costly.

- **Uneven temperature.**

Temperature inconsistency is very common with ducted systems, which is usually caused by improper sizing, poor insulation, ductwork damage, and leaks. By using a mini split, you can install a system that's specially designed for targeted cooling/heating.

- **Higher energy costs.**

Unlike traditional air conditioning systems that are proven energy-hogs due to their greater need to use energy, the ductless mini split systems are designed with higher energy-efficiency and built with energy-saving components and functionalities that enable you to lower your monthly energy consumption.

- **Very high maintenance costs.**

Compared with the traditional AC systems, the mini split units are very easy to manage and maintain.

- **Not flexible.**

Unlike the traditional systems, a mini split is versatile enough to accommodate all of your cooling and heating needs, especially those that require a unique type of installation.



## WHY LIVING IN A WARM WEATHER AREA GIVES YOU MORE REASON TO USE A MINI SPLIT?

Extreme heat and humidity affect the performance of any air conditioner unit because the system is usually strained and forced to work harder. But that's the case with traditional cooling systems; not with a mini split.

If you're living in a hot and humid area where the mercury level can reach up to 90 degrees Fahrenheit, a mini split air conditioner, at the very least, can help you:



Withstand the hot climate year-round and mitigate serious risks to your family's health and well-being.



Have a much lower energy bill despite your household's higher demand for air conditioning.



## ENERGY-EFFICIENCY RATINGS

### WHAT DOES THE ENERGY EFFICIENCY OF YOUR MINI SPLIT MEAN?

The energy-efficiency of your mini split unit pertains to its capability to achieve the maximum cooling comfort while using lesser amount of energy. One way to know the energy-efficiency of your particular cooling and heating system is by looking at its energy efficiency ratings.

### WHAT ARE THE ENERGY EFFICIENCY RATINGS?

Energy-efficiency ratings are the standard system performance ratings used in the HVAC industry to calculate, measure, and express the energy-efficiency of an air conditioner. Some of the most significant energy-efficiency ratings to look at are the Seasonal energy efficiency ratio (SEER), the Energy efficiency ratio (EER), and the Heating Seasonal Performance Factor (HSPF).





## WHAT IS SEASONAL ENERGY EFFICIENCY RATIO (SEER)?

The Seasonal Energy Efficiency Ratio (SEER) pertains to the efficiency or performance of a unit in relation to the amount of energy that it consumes in a specific period.

Technically, SEER is the cooling output (in British thermal units or Btu) of a unit in a given period or season divided into your total energy usage in watt hours that was consumed in the same period or season. The quotient is the efficiency rating of your unit.

Here's how it looks like:

$$\text{Cooling output} \div \text{Total energy consumption in a given period} = \text{SEER}$$

To give you a better idea, let's say that there are two units that were used simultaneously during the whole Summer period. The model that consumed lesser amount of energy has usually the highest SEER and considered the more efficient. In a nutshell, the higher the SEER, the more energy-efficient the unit is.



## WHAT IS ENERGY EFFICIENCY RATIO (EER)?

The Energy Efficiency Ratio (EER) provides you an insight how much cooling capacity the unit provides from a specific amount of energy that is used. Every air conditioner is assigned with a specific EER. It is expressed in values or number.

In computing the EER, the cooling output of a particular unit (expressed in British thermal units or Btu) is divided by the amount of energy used (in watt hours). The ratio derived is the EER of the system.

In other words, it's the unit's Btu rating over its wattage. In formula, it is expressed as follows:

$$\frac{\text{Cooling output (in Btu)}}{\text{Total energy usage (in watts)}} = \text{EER}$$

To help you get a better grasp of this idea, let us use Gree Crown+ as an example. This particular model has the highest capacity of 18,000 Btu. Let's say that you bought this model and in one instance it consumed 1200 watts of electricity.

To find the EER, you do the following calculation:

$$18,000 \text{ Btu} / 1200 \text{ watts} = 15 \text{ EER.}$$

Basically, the higher the EER means the more energy-efficient the system is.



## WHAT IS HEATING SEASONAL PERFORMANCE FACTOR (HSPF)?

The Heating Seasonal Performance Factor (HSPF) of a system refers to its total heating efficiency for a specific season. Just as SEER determines the efficiency of an air conditioning system for a specific cooling season, the HSPF is used to determine the efficiency of a heat pump for a specific heating season.

Since ductless mini splits can work both as an air conditioner and as a heat pump, determining the HSPF of mini splits is just as important as finding out their SEER.

Technically, the HSPF is the ratio derived when you divide the total heating output (expressed in Btu) of a unit with the total energy used during a specific season. To further explain, let's use a Gree mini split model as an example.

Let's say you purchased a Sapphire unit with a rated capacity of 18000. After using it over the whole winter season, you've determined that it consumed 1200 W. By dividing the total heating output with the total energy consumed, you get 15 HSPF. Now, let's assume that your current heat pump at home has a rated capacity of 36,600 with 8 HSPF. This unit can cost you 4575 W during the whole heating season. Now, if you replaced it with a Gree Neo ductless heat pump with the same rated capacity of 36,600 but with a 10.0 HSPF, your energy consumption on the same heating period will just be 3660.





## WHY UNDERSTANDING THE ENERGY EFFICIENCY RATINGS MATTERS?

While performance and features take much of the sales narrative when you're out shopping for a new air conditioner, don't forget that the system's energy efficiency can give you the most value for your dollars. Knowing about the energy efficiency ratings will help you properly compare the different systems in terms of their energy-savings capability and effectively avoid settling for a less efficient unit. Remember that a more energy-efficient unit can drastically cut your energy-costs. Knowing about the energy efficiency ratings will make you a smart buyer who knows the long-term financial benefits that come with picking a more energy-efficient unit.



## WHO SETS THESE ENERGY EFFICIENCY RATINGS AND WHY?

In the United States, the Department of Energy (DOE) regulates and sets these efficiency standards. As an initiative to conserve energy, lower greenhouse gas emissions, and curve energy costs, the government makes it mandatory for manufacturers to follow the minimum efficiency or performance standard for all energy-using equipment and appliances that they produce.

## WHAT ARE THE MINIMUM SEER IN THE UNITED STATES?

Currently, the DOE sets 14 SEER as the minimum standard rating in the Southeast region and Southwest region of the United States, which is understandable because these areas have a hot-humid and a hot-dry weather. In the northern parts of the country, the minimum SEER is 13. What this variation shows is simple—that the minimum standard SEER is set based on consideration to the climate differences among the regions.

As a side note, the minimum standard SEER for all areas in the US might again be adjusted after a consensus agreement was reached for the updated energy efficiency standards. By 2023, the Northern region will be mandated with a 14 SEER for units under or over 45,000 Btu/hr. In the Southern region, it will be 15 SEER for units under 45,000 Btu/hr and 14.5 SEER for those over 45,000 Btu/hr.

## WHAT DO YOU GET FROM A COOLING/HEATING UNIT WITH A HIGH EFFICIENCY RATINGS?

Choosing a cooling/heating system with higher energy efficiency ratings will normally give you the following benefits:

- **Significant energy savings**  
Low energy consumption translates to lower electricity bill. Lower utility bills mean more money-savings.
- **Enhanced cooling comfort.**  
Air conditioners with higher energy efficiency ratings are also known to be more effective in terms of cooling/heating performance due to better technology, design, and components.
- **Minimum cost of ownership**  
As an investment, air conditioners with higher energy efficiency ratings are typically built robust and durable, and therefore, less prone to system breakdowns.
- **Low carbon footprint.**  
Cooling/heating units with higher energy efficiency ratings are built with eco-friendlier components, including an ozone-friendly refrigerant.



# MINI SPLIT BASIC CONFIGURATIONS: SINGLE-ZONE AND MULTI-ZONE

## WHAT IS DUCTLESS MINI SPLIT ZONED COOLING/HEATING?

Zoned cooling/heating is a type of HVAC installation configuration where the home is divided into different zones. Each of these zones is a targeted space for climate control.

While central air conditioning system can also be used for temperature zoning, the more innovative ductless mini split system is specifically designed for this type of application, making it the more conducive system for single-room or whole-home climate control.

## HOW DOES ZONED COOLING/HEATING WORK?

In mini splits temperature zoning, your home is divided into different zones, where each zone is installed with a ductless mini split air handler. You can connect multiple air handlers or evaporator units with just one outdoor unit. This means that you can choose to heat or cool as many rooms as possible with just one outdoor condenser unit.

The air handler in every zone can be controlled independently of each other, either through a designated thermostat or remote controller. This means that you can set different levels of temperature in different rooms or even decide to turn on or off the indoor unit in each room without any impact on the rest of the units. The number of indoor units that you should use will really depend on the number of rooms that you need to heat or cool.

## WHAT ARE YOUR ZONING OPTIONS?

Zoned cooling/heating can be done in two ways—single-zone and multi-zone.

## WHAT IS A SINGLE-ZONE COOLING/HEATING?

The single-zone cooling/heating is a 1:1 configuration, which means it is set up in a single room using a single ductless mini split system which consists of one indoor unit and one outdoor unit.

## WHAT ARE YOUR OUTDOOR UNIT AND INDOOR UNIT CHOICES?

The outdoor unit of a ductless mini split system is basically just the compressor/condenser unit. All of the outdoor units may vary in capacities, but they all look the same. In contrast, the indoor units of a mini split system come in different styles, characteristics, and capabilities. While all of these are built for the same purpose, they are installed differently.

For the indoor unit, your choices include the wall-mounted which is set up on the wall; the horizontal-ducted which is normally concealed in a ceiling or below the floor; the ceiling-cassette that you can place discreetly even in a hard ceiling, the durable ducted air handler that you can practically place anywhere (even in cramped spaces); and the floor-mounted that is installed just a few inches from the floor.

## WHAT ARE THE MAIN DIFFERENCES BETWEEN SINGLE-ZONE AND MULTI-ZONE COOLING/HEATING?

Aside from the number of indoor units required, single-zone and multi-zone configurations differ in the following aspects:

- **Cost.** Understandably, a multi-zone ductless system installation would cost you more than a single-zone application. The cost, of course, would come proportionately with the number of indoor units that correspond to the number of your home's designated zones.
- **Simplicity/Complexity of installation.** Ductless mini splits are easy to install. Comparatively, however, a single-zone system is easier to set up than a multi-zone solution.
- **Requirement for additional materials or components.** A single-zone configuration would just typically require three basic main components—one outdoor unit, one indoor unit, and the accessories which include a refrigerant line set. A multi-zone application, on the other hand, would require you more combinations of these components depending on your specific cooling or heating requirements.



## WHEN DOES A SINGLE-ZONE COOLING/HEATING WORK BEST?

While the conventional single-room HVAC systems, like room air conditioners for example, can be practical options in many ways, the single-zone cooling/heating through the ductless mini split system remains the best choice. That is, if you're looking for higher efficiency, performance, and savings. This is in addition to the fact that traditional systems do not always work as you've expected based on your specific requirements, expectations, and situations. In particular, a single-zone cooling/heating using a mini split works best in the following conditions:

- When you are adding room to your home.
- When you are converting an area of the house into a new functional space.
- When you are constructing a new home or remodeling a house.
- When you are upgrading or replacing a part of your old cooling and heating system.

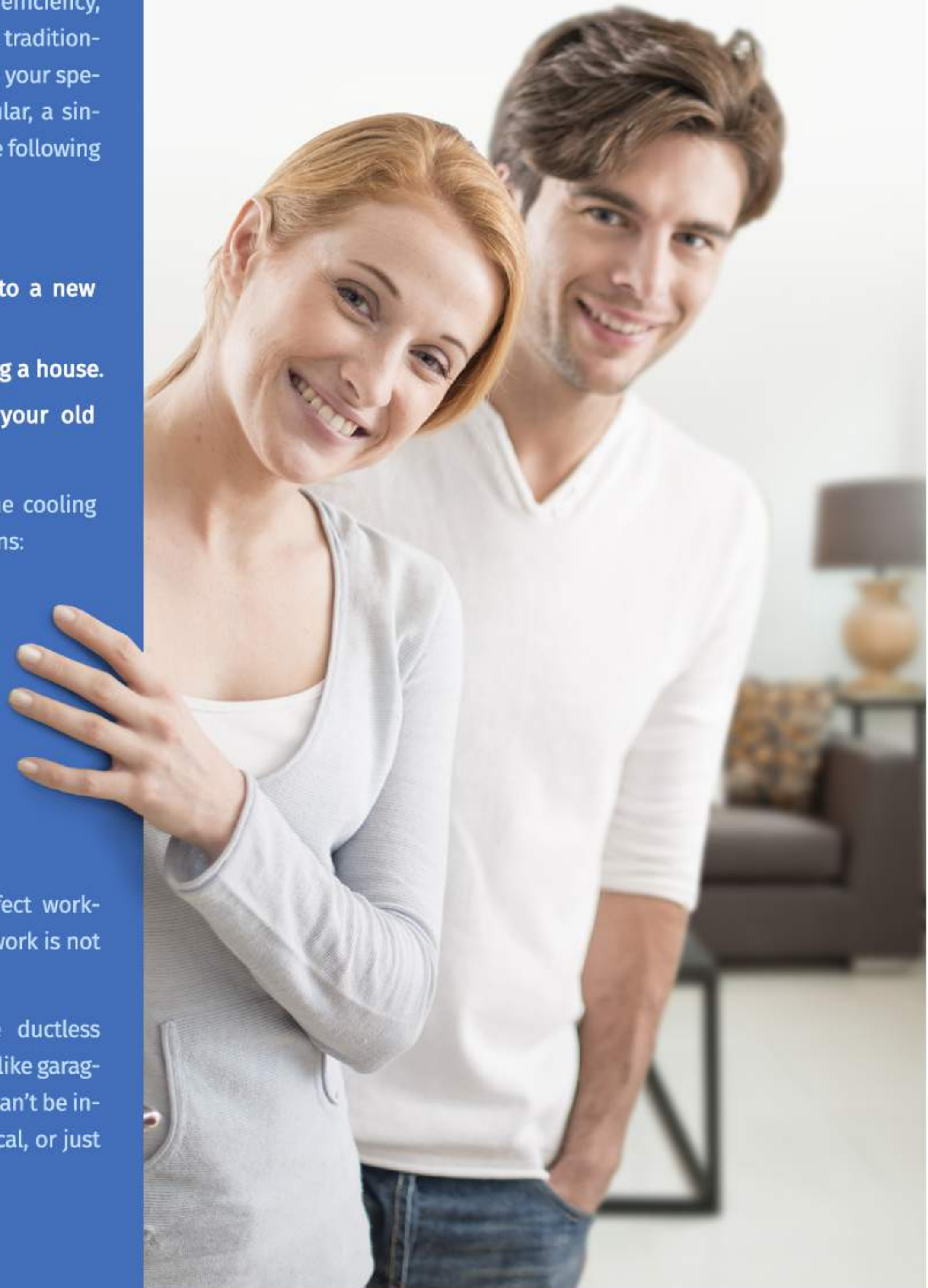
Why these given situations merit the need for single-zone cooling and heating via ductless system is due to two simple reasons:

1. Ductwork is an issue.
2. Energy-efficiency is a must.

Remember that despite the many advancements in HVAC solutions, it can't be denied that most of the cooling and heating issues that many households grapple with are directly caused by the limitations that are inherent to traditional, ducted systems.

Luckily, the single-zone ductless systems provide a perfect workaround when you want to cool or heat a room where ductwork is not possible or cost-effective.

Offering precise temperature control, your single-zone ductless system will enable you to effectively cool or heat any room (like garages, attics, basements, etc.) where ductwork is not present, can't be installed, or expanding it might be too expensive, not practical, or just entirely not possible.



## WHEN DOES MULTI-ZONE COOLING/HEATING WORK BEST?

Just like with the single-zone application, some of the issues that the multi-zone cooling/heating resolves are related to temperature inconsistency, energy-inefficiencies, and other limitations that are associated with the ducted systems. Specifically, here are the situations when the multi-zone cooling/heating might be your best option:

- Your home has two or more floors or levels.
- Your home's ducted system wouldn't be able to accommodate (for cooling or heating).
- You live in an old house and installing a new ductwork is not an option or just not practical.
- You are using a centralized HVAC system but the temperature inconsistencies are causing rift within your family due to different temperature needs and preference.

Essentially, effective climate control is one of the biggest reasons why multi-zone cooling/heating is your best choice for whole-home comfort. Through the individual controllers for each unit inside the room, you will be able to set different temperatures for different rooms or turn on or off the system in any unoccupied room. This provides an excellent way to enhance your temperature comfort at home while earning substantial savings from lower energy consumption.



## WHAT ARE THE BENEFITS OF ZONED COOLING/HEATING?

In view of the many cooling and heating challenges that we face with regard to the traditional HVAC systems, zoned cooling/heating via mini split systems provide the following benefits:

- **Precise temperature control.** Zoned cooling/heating enables you to effectively cool or heat a specific room, zone, or any space that is targeted for climate control whenever you want to (and as conveniently and as easily as possible).
- **Customized comfort.** Zoned cooling/heating enables you to select the temperature for any room based on your specific needs or preference, which in effect, allows you to experience more personalized comfort
- **Powerful cooling and heating.** Ductless mini split systems are typically designed with advanced HVAC technology. When used for zoned cooling/heating, you can be assured of maximum comfort regardless of the type of installation.
- **Cost-savings.** The ductless mini split systems consume less energy even when cooling or heating at full capacity and at a longer period than traditional systems. Using a mini split also enables you to completely avoid the usual problems that are related to loss of cool or warm air. Additionally, mini splits have excellent level of energy efficiencies as attested by their high SEER and EER ratings as well as Energy Star certification. If you're looking to really drastically reduce your utility bills and gain more savings in the long term, then choosing ductless units for zoned cooling and heating is a no-brainer decision.
- **Versatile applications.** The lack of requirement for ductwork as well as the compact and unobtrusive design of mini split systems only make zoned cooling/heating the best option for your unique applications.

## SINGLE-ZONE OR MULTI-ZONE: WHICH ONE IS THE BEST CHOICE FOR YOUR HOME?

Choosing between single-zone and multi-zone is not a matter of finding which one is better. The truth is, everything is going to boil down to your specific needs, requirements, and situation. To be able to really determine the best choice for your home, you will have to consider a few factors, like the size of your room, the feasibility of installation, the cost, and many others. You also need to determine if any of your choice fits to the specific situations where the single-zone or multi-zone cooling/heating might work best. If you're still finding it difficult to decide, it would not hurt if you seek the help of an HVAC professional.



## DUCTLESS MINI SPLIT AS A SMART AC SOLUTION

### WHAT ARE THE BENEFITS OF ZONED COOLING/HEATING?

Feature-rich and ultra-high efficient and powerful, the ductless mini split systems undeniably carry the hallmarks of a highly evolved and more sophisticated air-conditioning system that is a perfect match for automation. Specifically, a ductless air conditioner enables you to:

- **Control the unit from your smart device.** Wi-Fi-enabled, the system can be connected and accessed from your smart phone or tablet through the installed Smart app.
- **Set the unit to operate on a specific period of time.** Built with a timer, the unit can be programmed to run or turn off depending on a set amount of time.
- **Turn on the sleep mode.** Using the available sleep modes, you have the option to adjust the room's temperature during your sleep. This will enable you to save energy consumption without affecting your comfort level.
- **Sense and control the temperature at the remote controller instead of at the indoor unit.** Designed with the sensor function, some units can be programmed to adjust the airflow and temperature based on what is sensed by the remote controller.
- **Choose your desired room temperature.** Featuring a multi-operational mode, the controller provides you with the option of setting your unit to any of the available operational modes: heat, cool, dry, fan only, and auto.
- **Secure the unit with a touch of a button.** Built with a timer, the unit can be programmed to run or turn off depending on a set amount of time.
- **Conveniently read the temperature from the controller.** Featuring a large backlit LCD display, you can program the controllers to display the temperature reading in °F or °C. consumption.



As a side note, it is worth noting that not all mini splits share the same smart capabilities. Some smart functions sometimes vary by type of the unit or brand.



## WHAT ARE THE SMART FUNCTIONALITIES AND CONTROL OPTIONS THAT ARE BUILT IN A MINI SPLIT?

Ductless mini split units come with an array of smart operational functionalities and control options that enable you to personalize your whole comfort experience. With mini splits, you will have a range of options—whether you want to control the fan speed, adjust the airflow, time the unit's operation, or set the room temperature, among many other things.



Most of the mini split systems are available with easy-to-use and multi-functional smart remote controllers. Most notably, the recent models have controllers that are built with smart technologies, like an infrared system. Most mini split models are also Wi-Fi-enabled, which means that you can connect these units to the internet and conveniently control the whole system directly from your smartphone or any mobile device where a dedicated mobile app is installed.

Building on the existing smart capabilities of advanced air conditioners like ductless mini split systems, some add-on AC control tools are also made available to enable the deployment of wireless remote access, control, management, and maintenance. Among these accessories designed to create a smart system out of non-connected but automation-ready AC units are the sensor-equipped and Wi-Fi-enabled smart AC control devices.



## SOUND LEVEL OF A DUCTLESS MINI SPLIT

### ARE DUCTLESS MINI SPLIT SYSTEMS AMONG THE QUIETEST COOLING AND HEATING SOLUTIONS?

Currently, most of the air conditioners in the market have a sound level between 30 dBA to 70 dBA. That's a level of sound that ranges from a human conversation to a loud noise of people that are simultaneously talking inside a room. A 20 dBA air conditioner sounds like the ticking of a clock. But with mini split, you can have a system that's even more quiet.

Most mini split systems are available with as low as 19 decibels, and that's a sound level that's barely a whisper. At most, the noise level that a mini split could make is the same level as a quiet conversation between two people.

The outdoor unit of a mini split system has a bit higher noise level than the indoor unit for the obvious reason—it contains the compressor and motor systems. Nonetheless, they are still a lot quieter than most traditional ACs. And when you consider the fact that these units are placed in a convenient spot outside the house, then there would be no noise problem at all.



## WHAT MAKES MINI SPLITS QUIETER THAN TRADITIONAL AIR CONDITIONERS?

Essentially, these are the main reasons why the mini split is the quieter AC option:

**Split-type design.** A ductless mini split is a split-type system. Unlike a window AC where all of the main components are housed in one single casing, the mini split consists of two main units. The first one is the outdoor compressor/condenser unit which is normally placed outside the house. This particular unit has all the noisy parts, so to speak. The other one is the indoor air-handling unit that is mounted inside the house or room. These two main components are linked together by a set of refrigerant lines, power cable, and the condensate drain line that are all passed through a small hole in the wall. Obviously, because the compressor and the motor systems are located in the outdoor unit and what's left inside your room is just the component that quietly takes care of the evaporation, air filtration, and air distribution functions, then the noise problem, if there's any at all, is only concentrated outside. But then, this is not the only thing that makes a mini split system special, sound-pressure-wise. What's more amazing is how the compressor system of most mini splits comes as exceptionally quiet as well. And if there's any explanation for this, it would be advanced technology.



**Advance technology.** This is a given—ductless mini splits are more technologically advanced than many other traditional systems. With the advantage of an advanced technology in its system, mini splits tend to operate quietly. In fact, many mini splits operate at very low decibel level—both the outdoor and indoor units. The main reason why they can run at very low sound pressure level is because this type of system is normally engineered to reach the set temperature as quickly as possible. It means there would be no extra work that typically leads to those rumbling sounds that you'd normally hear from a packaged system like a room AC. Generally, the advanced compressor system makes this possible, but the mini split's low-noise operation is also facilitated by the integration of other innovative internal components. A major mini split brand, for instance, makes use of an insulated compressor compartment and a vibration dampener that extremely reduces the noise of the system while in operation.



**Built durable and robust.** Compared with the traditional ACs, mini splits are just better engineered, thanks mostly to the integration of advanced technologies, whether in the air conditioning, fan, or filtration system. Essentially, this makes the mini split system more durable and capable to handle bigger loads. The truth is, most mini split systems can work even in an extreme climate condition. A more advanced mini split system, for example, can still provide you the exact needed comfort even when the outside weather is at sub-zero temperature. An average window AC would just fail in this type of condition because it might have to work harder. And when an air conditioner is forced to work harder, it becomes prone to several system malfunctions. Most of the time, a loud, clunky noise is a sign of a malfunctioning system. In fact, your AC can get frozen anytime, mostly due to a leaking refrigerant. And when this happens, you can be sure that you will hear a disruptive, annoying sound from the unit.



## WHY IS IT ESSENTIAL TO HAVE A QUIET AIR CONDITIONER?

A noisy air conditioner or even a system that you can say runs a little bit loud has serious implications to your experience of comfort. A noisy air conditioner affects your peace of mind; it ruins your experience of a good rest; and to some, it has serious impact on health. In many occasions, the noise that comes from the unit also creates conflict among neighbors.







# CHOOSING A DUCTLESS MINI SPLIT

## HOW TO FIND THE RIGHT INFORMATION ABOUT THE PERFECT MINI SPLIT FOR YOUR HOME?

Let's be honest, nobody talks about HVAC systems outside shop talks. So no shame in not knowing a single thing about air conditioners. But when you're on the market for a new AC, a little knowledge about a few important things will come real handy. Sufficient information is key, and to make sure that you'd not make mistakes on your purchase, you might have to do the following homework:

**Research.** You can scour online, visit a few stores, look at different air conditioning systems that are available, weigh your options, and ask questions. A lot of it, if possible. While doing this, you should only have one goal—find the right system that suits your need and fits your budget. Fret not if you still end up failing to figure out the most ideal, and cost-effective system for your home. Your effort will still pay off. What you've learned along the way will most likely enable you to bridge (if even a little) the knowledge gap when you finally talk with the dealer and an HVAC contractor. Remember that the worst thing a consumer can do is to go buying blind.

**Get advice from a professional HVAC contractor.** Research is one thing, but seeking help from an HVAC pro will make your buying decision solidly supported by facts and expert knowledge. The HVAC contractor will play a very critical role—from the evaluation of your AC need, to your purchase, and down to the installation and upkeep of the system. This expansive role makes it imperative that your contractor is reputable, knowledgeable enough on the HVAC service trade, and offers fair, reasonable deal. To find the best contractor, try put an extra effort on your vetting process.



## 2 ESSENTIAL ELEMENTS THAT YOU SHOULD BE LOOKING FOR IN A MINI SPLIT

When everything is said and done, buying an AC always boils down to just one very specific goal: own a superior system that enables you to achieve maximum cooling comfort and energy-savings.

With a plethora of options and mind-boggling things to take into account, it is important that you never lose sight of this objective. And to do so, you have to keep in mind that when everything is stripped down to the basics, what you should really be looking for in an air conditioner are the following:



### Operational performance

There's nothing more important than having an operationally reliable system that can give you the exact comfort that you need. Many AC systems vary in terms of performance due to differences in components and functionalities. If you're looking for higher performance, you can select from many advanced, feature-rich systems that are available in the market today.



### Energy-efficiency

Air conditioning systems have come a long way. Most modern AC systems today are designed to be more energy-efficient than the old, traditional systems. Most are equipped with energy-saving components (like advanced inverter technologies) and smart features (like energy-saving modes).

Remember that knowing what to look for in an air conditioner prior to purchase, while extremely helpful, is just one part of the whole process. When you've finally covered all the basics as far as preparations are concerned, then you will have to start looking into a few important considerations prior to purchase.



## 5 THINGS TO KEEP IN MIND WHEN CHOOSING A MINI SPLIT

When buying a mini split air conditioner, you don't just drop in a dealership, pick one you liked, throw in some bucks, sign the paperwork, and voila you have the perfect AC. So much more come into play. So, before you go out shopping, it pays to consider the following:

### 1 The place where you live

That's right, the place where you live has a lot to do with the efficiency of your system. Let's say you're living in a warm, coastal region. Because the sun scorches hot every day, your most ideal choice is a system that is a real workhorse—one that is robust enough to endure the extreme climate and energy-efficient enough to keep you from losing money on utility costs.

### 2 The size of AC that you need

Yes, size matters, especially in air conditioners. And when we say size, we're not talking about dimensions or proportions. Size, in air conditioners, refers to the capacity of the system to remove heat on a specified amount of time. So, when you're buying an AC, don't just pick any size; choose the right size that's proportionate to the size of your specific space.

### 3 The size of the space and its cooling/heating needs

Consideration on the size of the AC would be impossible if you don't take into account the size of the place that you want to cool or heat and its particular cooling/heating needs. If you have a very small space to cool/heat, a bigger AC (in terms of its capacity to remove heat) is not the right size. If you have a large room, a small AC (again, in terms of its capacity to remove heat) is not the perfect one either. In other words, the capacity of the mini split that you should purchase should be proportionate to how big or small your space is and the level of cooling/heating that it requires so you can achieve your desired comfort. To avoid mistakes on this crucial task, you can always ask the help of your hired HVAC contractor.

### 4 The condition of the place

Aside from knowing the size of the place that you need to cool/heat, it is also very important that you consider the overall condition of the room. To do this, you need to determine the specific things that might affect the performance of the system. Ask yourself the pertinent questions, such as "Is the room properly insulated?" or "Is the wall in the room built with a material that can absorb more heat?" Again, your HVAC expert can also help you answer these questions when they visit for inspection.

### 5 The type of the room

The type of the room where you are going to use the air conditioning system is just as important as the other considerations. Mostly this is to avoid unforeseen issues when it comes to installation. So you ought to ask yourself: "Is it a garage, a basement, an attic, or any type of room addition?" Taking this into account will help you easily identify the exact type of mini split that you will have to buy.

## 2 THINGS THAT SHOULD INFLUENCE YOUR PURCHASING DECISION

Now that you've determined the critical things to consider before the purchase, you're ready to take the next step, which is to determine the following:

### 1. The type of system that you really need

Just like the other systems, mini splits are not all the same, whether in terms of size, capacities, configurations, features, and brands. So you will have to ask yourself a few important questions. One example is: "Do I need a single-zone mini split system or a multi-zone system?" Knowing what you really need will guide you all throughout the decision-making process.

### 2. The amount that you're willing to pay for the unit

Just as air conditioners vary in types and capabilities, so are the cost. Like any type of purchase, buying an air conditioner puts you in a "what you can afford is what you get" situation. Your budget, therefore, should be a major consideration when you start choosing for the right unit.





## SHOULD YOU CONSIDER THE BRAND?

This is the question that almost everyone who bought an AC almost always wrestled with.



There are too many brands of AC out there, and if we take all these brands into consideration, the choice is no brainer—you'd choose the top name brands. While familiarity is an influencing factor for the choice, there's also a logical explanation—these systems are better designed, their technology more advanced, their features more innovative, and their reputation is beyond question. When faced with a choice between a known brand and a lesser-known brand, you'd be wiser to pick the former.

But choosing the best brand is not the same as making the best choice.

Yes, it matters when among the given choices, the differences in brand present proportionate differences in the quality of operational performance, efficiencies, and possible cost-savings. And no, it doesn't matter when the brand choices are flat-out insignificant to the main purpose of your purchase. All things being equal, your perfect choice should always be the one that suits your requirements and budget.

Nevertheless, when buying an air conditioning system, always keep in mind that there are far more important things to pay attention to than brand.



## SIZING YOUR MINI SPLIT

### WHY SHOULD YOUR MINI SPLIT UNIT BE PROPERLY SIZED?

To get the best comfort and maximize energy savings from your mini split system, you need to make sure that the size or capacity of the unit is proportionate to the size of the room and other factors that may influence the distribution of cool/warm air.

### WHAT DOES “SIZE” MEAN WHEN IT PERTAINS TO AIR CONDITIONERS?

When it comes to air conditioners, size is measured based in “tons.” It pertains to the amount of heat (measured in British Thermal Units or BTUs) that an air conditioner can remove in a space per hour. One ton is equal to 12,000 BTUs per hour. This means that if you have a one-ton room air conditioner, your system can remove an amount of heat that is equal to 12,000 BTUs per hour. So, if you bought a 2-ton room air conditioner, then you can effectively cool/heat 24,000 BTU per hour. The idea is simple: the bigger ton means higher BTU; and the more BTU means the bigger the air conditioner is in terms of size. The main takeaway here is you need to get an air conditioner with a size that is right for the size of your room.

### WHAT HAPPENS IF YOU USE AN OVERSIZED MINI SPLIT?

Having an oversized mini split means you have a very high-capacity system for just a small room. An oversized unit can quickly cool a small room but it will undergo a process called short cycling, which is bad for your unit. In this case, here's what happens. When you turn on the unit and set the thermostat to a specific temperature, your system will run until it achieves that temperature. Because it is a high-capacity system and you are using it in a small room, the temperature will be quickly achieved. Normally, when the air conditioner reaches the set temperature, it shuts down, and then turns on again because it will have to maintain that temperature. This cycle repeats again and again and this process happens inside the unit without you even knowing it. As a result of short-cycling, the humidity in the air is not completely removed. Worse, your system wastes energy by simply turning on and off and on again. This will not only cost you money in terms of higher electricity bill but will also most likely contribute to unnecessary wear-and-tear on the unit that might soon completely damage the system.

### WHAT HAPPENS IF YOU USE AN UNDERSIZED MINI SPLIT?

Having an undersized unit means you have a low-capacity unit for a big room. You cannot expect that it would actually provide you with the much needed comfort. It might still cool/heat the room but it would take a longer time. And even so, it would not be enough. The system will just keep running and wasting energy. The result, obviously, would be higher energy consumption which is the last thing you need for an appliance that is already contributing a lot in your home's total energy use.

### WHAT SHOULD YOU DO TO DETERMINE THE PERFECT SIZE OF A MINI SPLIT FOR YOUR ROOM?

If you want to be sure that you can get the right system for a specific space, the best course of action is to seek the help of an HVAC expert who can properly calculate your cooling/heating requirements.



# FINDING AN INSTALLER/HVAC CONTRACTOR

## HOW TO FIND A GOOD INSTALLER?

Finding a good installer should be your priority if you are buying a mini split. According to ACDocor.com, poor installation can reduce the efficiency of your system by 50% (not to mention the cost of hiring someone to fix the mistakes).

Obviously, what you need is an HVAC guy who is comfortable with installing this type of system, and not some random guy that canvasses the neighborhood in a pickup truck. You need a certified technician to have the warranty kick in.

To ensure that you get a professional work on your system, your first order of business is finding the right HVAC company that provides installation services. Just remember that finding the best HVAC company is not so much about looking for the most popular, but more on finding the right one. This basically means you need to get the HVAC service provider with the expertise on mini splits and someone that can give you the best value for your money.

For starters, you can search the ACDocor's database to find the right contractor that operates in your area. Get the names and numbers of at least two or three companies so you would have more options. Call them and ask the right questions to get an idea about their credentials and expertise on mini split. Ask how long they've been in business. Ask for references. It could be names and phone numbers of former customers. If you feel you're being stonewalled, move on to the next company.



## WHAT SHOULD YOU BE LOOKING FOR WHEN IT COMES TO HIRING AN HVAC CONTRACTOR?

To help you weigh your different options, here are a few of the important things that you need to look for and consider before signing the dotted line and locking in the deal with an HVAC contractor.

**Expertise on mini splits.** With mini splits just recently became popular in the United States, it is safe to assume that not all of these installers or HVAC service providers have sufficient experience working on this particular air conditioning technology. Choose the one with the best expertise on a mini split system.

**The brands it carries.** You will have to determine whether this particular provider actually carries that same specific brand that you've chosen, and whether this company has the necessary expertise and experience in this particular brand, and whether the price tagged on this brand is within your budget. These considerations make up the real value—not just of the brand—but more importantly, of the deal that you're going to make with the HVAC company.

**The types and range of services it offers.** Different HVAC companies vary in types of services and their associated terms and conditions. To make sure that you'll get the best deal out of an HVAC contractor, make sure that the services being offered are not only comprehensive but just exactly the services that you really need.

**The cost of its services.** Cost, certainly, is an important consideration; and to a large extent, even a deal-breaker. Take note that going for the most expensive doesn't necessarily mean that you're getting the right deal. In the same vein, going for the less expensive is fraught with a lot of risks. Your best move is to consider cost without compromising the quality of the service that you'll get. The only way that you'll get more bang for your buck is to pick a contractor that can provide you with a cost-effective service package that's fully structured to your need.

**Its reputation.** Hiring a reputable contractor should be non-negotiable on your part because you're basically entrusting that company the stability and reliability of your cooling and heating system at home. To find the best one in your area, start by checking reviews online about the companies that you've narrowed down, ask about them from people you know who have availed of similar service, and call the company directly and ask for referrals or recommendations from previous clients. Take a special note of what the people generally say about these companies.

**Its licenses and credentials.** HVAC companies are required to secure licenses before they carry out some projects. They also have a duty to provide liability insurance. When dealing with an HVAC company, make a point to ask about its licenses and credentials. Knowing that your HVAC contractor is properly certified and legally permitted to work on an HVAC project gives you an assurance that you will get a quality service. The provided insurance is also important because it will protect you from unforeseen damages.

Remember that your HVAC system is a big investment, and choosing the best HVAC contractor is a major decision that you'll have to make. In the long run, whatever HVAC company you will eventually pick and hire will play a huge role on how you can totally enjoy and maximize the advantages of your mini split system at home.



## HOW TO EFFECTIVELY COMPARE BIDS FROM CONTRACTORS?

When looking for the right contractor, it's best to get at least three bids. It's usually difficult if they're showing you apples and oranges. For consistency's sake, give each contractor the brand and specific model that you plan to install. Ask them to break down any broad categories (labor, for instance). If you see a number that seems too high, poke it. Ask them to be specific. Be suspicious as well of numbers that are noticeably lower than their competitors.

Compare the bids side by side, but don't rush to accept the lowball estimate. Price is a factor but it's far from the only factor. Even if you think you could save a lot of money with the guy who goes door to door asking if you need a new air conditioner, it's not worth the risk. Ask the contractor to show his certifications. Is he qualified to handle refrigerants? Is she a member of a professional organization such as ACCA (Air Conditioning Contractors of America)?

Even if you've already identified a mini split that you like, ask the contractor for input. Does he or she agree with the size of the unit that you've chosen? If not, ask why not? If the contractor doesn't offer a Manual J, again, ask why not?

Don't— under any circumstances— accept an estimate that is phoned in. If your contractor doesn't have time to make a house call, that's not a good omen.

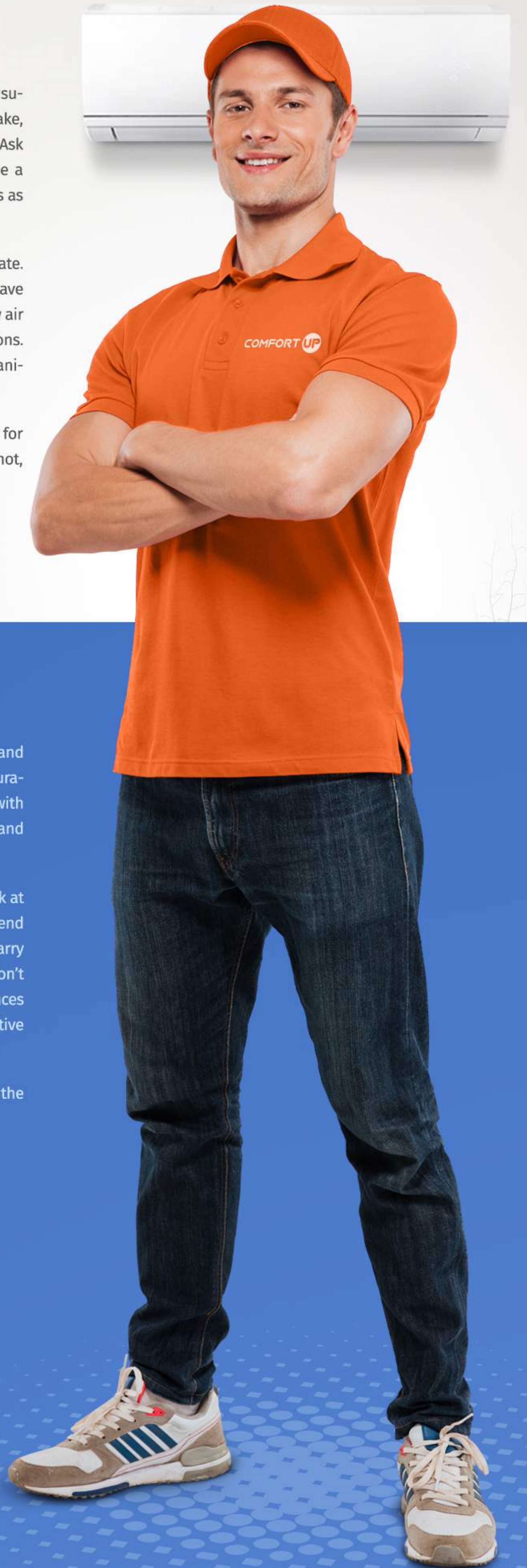
## WHY IT'S IMPORTANT TO CALL THE CONTRACTORS' REFERENCES?

By following up on the contractors' references, you'll be able to dig deeper and find out their expertise on mini split, the quality of their installation, the duration of the job that they usually perform, their service cost in comparison with the others, the extent of their support, the way they honor obligations, and many others.

The biggest mistake that most homeowners make is failing to seriously look at the reputation of the competing bidders on their project. As a result, many end up locked in a contract with HVAC companies that provide bad services, carry out bad practices, and still taking money. To avoid falling into this trap, don't hesitate to call the references. It's been our experience that 95% of references are happy to talk about their experience and will be honest with a prospective buyer or customer of an HVAC service.

When you call the reference, have a few questions at the ready. You can ask the following questions:

- Did the contractor show up on time?
- Was he or she forthcoming and honest about the time and expense of the installation?
- Did they clean up after the job?
- How long did it take them to finish the installation?
- Has the system worked as expected since the installation?
- Did the reference need to call them back to make it right?
- What kind of system did they have installed?
- Is it similar to the one you are considering?





## WHAT'S THE BEST WAY TO EVALUATE THE INSTALLER BEFORE AND AFTER THE JOB?

After you've interviewed the references, it's time to have a talk with the prospective installer. You've considered the bid, now here are some ways you can evaluate an installer— before and after the job:

Did he or she sit down and talk with you about your home and lifestyle? (i.e., how many people live here? Are they home all day? Is the home multi-story?)

- Did the HVAC installer inspect the system that you currently have?
- Did he or she perform a Manual J? Did they give you a copy of the load calculation?
- Did they suggest a programmable thermostat (if you don't have one)?
- Did they test and confirm the refrigerant levels after the installation?
- Did he or she make sure that the outdoor condenser is not buried under a deck or exposed to a watershed from a gutter or overhang?
- Did he or she show you how to change the filters?
- Did he or she leave the installation and service manuals where you can easily find them?
- Did the HVAC installer offer a service plan?

Remember that an HVAC relationship is not speed-dating. Your association with an HVAC guy is like a relationship, not a one-night-stand. Even if your new system works like a charm, you will need service. If there is a problem, you don't want to find yourself hunting for a better alternative.

Some tasks are made for DIY— changing filters, for instance, or raking leaves away from the outdoor condenser. But the other tasks require a professional (lubricating moving parts, checking refrigerant levels, adjusting thermostats and sensors). For this reason, forget the speed-dating. And if you get a sinking feeling after the job has been started, stop right there and reevaluate. Your installer has given you a contract, in terms of the estimate and what that entails, right? You both signed it. If you can identify areas of the contract that he or she is violating, you have grounds to back out (and that's another reason why the initial bid is so important). Think of it as a prenuptial: You need to protect yourself, no matter how much you love the guy.



## DUCTLESS MINI SPLIT: PRICE, COSTS, AND SAVINGS

### HOW MUCH DOES A DUCTLESS MINI SPLIT AIR CONDITIONER COST?

As for the ductless mini split, the system alone has an average price tag of \$1,500 up to \$5,000, although you can still get one with a much lower efficiency at a cost below \$1000. When it comes to installation, you might have to spend \$1,300 up to \$3700 on the average. When the costs for the unit, installation, and accessories for the mini split are all added up, you can expect to pay somewhere around \$4,000 to 6,000 at the minimum. The maximum expense would be around \$12,000. There are still variables involved, which include the size of the unit, number of air handlers, complexity of the installation, and even the system configuration that needed to be implemented. All of these will factor in to your overall cost.



# WHAT ARE THE FACTORS THAT AFFECT THE COST OF A MINI SPLIT AIR CONDITIONER?

The cost of mini split air conditioners is usually influenced by the following factors:

**Brand.** The mini split systems that are currently available in the market are produced by different manufacturers. Brand creates value on the product, and this brand value typically affects price. Well-known brands are normally more expensive than lesser-known brands. But while this is the typical case in a general sense, it is not a de facto situation in the HVAC market. Most of the time, brand comes secondary in value to other factors, such as system features, for instance.

**System Features and Capabilities.** A ductless mini split system is usually a feature-rich HVAC product. In the case of air conditioners, features normally translate to capabilities. It means, the more features a system has, the more capabilities it promises to deliver. Better features suggest higher capabilities. When a system, like a ductless mini split, is said to have higher capabilities, it subtly encourages a comparison with systems that are less capable in some aspects. Due to perceived advantages, comfort systems are priced differently according to their unique features and special capabilities. Most of the time, these cost-differentiating capabilities are driven by a couple of other important aspect of the system—capacity and energy-efficiency.

**Capacity and Energy-efficiency.** The capacity of a ductless mini split system to cool or heat a space and their energy-efficiencies are another determining factors for price. The higher their rated capacities are and the more they are energy-efficient, the more expensive they come. Capacity and energy-efficiencies can be expressed through the size of the system (in Btu) and energy-efficiency assurance is provided through high energy efficiency ratings. High-capacity and high energy-efficiency are unique characteristics of advanced AC systems. Just like any other products, this technological edge affects the price of the unit.

**Integrated Technology.** All of the ductless mini splits are typically technologically advanced when compared with traditional systems. Built with state-of-the-art components, ductless mini splits can understandably be commanded with higher price. But ductless mini split systems are not equal. Some are actually more advanced than the others. Any technological advantage that a particular mini split system has is a potential factor for price variation when the model is finally introduced to the market. The HVAC market, as you might be aware, is composed among other players, with dealers and contractors. These key players also play a large role in determining the HVAC product prices. In this regard, the price variation is also largely influenced by how the dealers and contractors provide additional support and services aside from providing the product.

**HVAC Support and Services.** When you buy an air conditioner, you normally would have to go through HVAC dealers and contractors. These entities do not only provide the system, but also normally offer services and support, which include installation, maintenance, and repairs. When buying a ductless mini split through an HVAC contract, it is important to factor in the costs that are normally associated with these services.



# WHAT ARE THE FACTORS THAT AFFECT THE COST OF A MINI SPLIT AIR CONDITIONER?

Generally, the overall cost of a mini split installation varies according to the type of system to be installed, the availability of other needed components, the amount of work needed, and complexity of the job, which is influenced by the location and type of application—whether it is a single-zone or multi-zone application.

In terms of cost, keep in mind that what you’re paying for the price of the installation are the following:



System



Labor/Installation work



Logistics and extra components

On the average, the installation work costs around \$1,300- \$3700. Typically, this covers the man-hours for two installing technicians who will work 8 hours on a given day, the equipment to be used, their logistics costs, taxes, premium on skills and specialization, and other intangible support that you will get from the deal.

When you get the mini split system from the same HVAC contractor that will provide the unit, your cost estimate would cover the costs of the system, required components, and installation. On the average the whole thing is going to cost you \$6,000 up to \$12,000 or more at the maximum. At the minimum, the cost can run from \$4,000 to 6,000. Of course, this overall cost can still go higher or lower depending on the many considerations as previously mentioned.



## WHAT FACTORS AFFECT THE COST OF YOUR MINI SPLIT INSTALLATION PROJECT?

The total amount that you will have to pay for the whole mini split installation project will be determined by the following:

- The type and size of the mini split system
- The quality of components
- The features and capabilities provided
- The specific application (single-room or multiple room application)
- The number of indoor units needed that matches the specific number of zones to be conditioned

## WHY IT PAYS TO INVEST IN A HIGH EFFICIENCY AC LIKE DUCTLESS MINI SPLIT?

It's true that costs can make or break our decision to make a purchase. When it comes to a high-efficiency solution like a ductless mini split system, it is important to keep in mind that the cost will be heavily offset by the many advantages that it can provide. Aside from the high-performance that ensures you maximum comfort experience, a ductless mini split is one of those systems that can practically pay for itself in the long-term. This cost-effectivity and money-saving capability come from the system's low energy consumption and lower maintenance cost.

## RECEIVING YOUR MINI SPLIT SHIPMENT

### HOW TO ACCEPT A FREIGHT SHIPMENT?

So you've selected your system, hired a contractor, and now you're waiting for the new unit to arrive. It could be a fairly substantial package. Not a grand piano, but heavier than the typical LL Bean package. You definitely want to be there when the delivery comes. Don't ask the neighbor or your teenage son to sign for this.

Chances are very good that the unit will arrive in good shape, and that everything you ordered will be included. But there is always a chance that your package was mishandled. Since ComfortUp is not in the shipping business, we rely on national freight carriers to get your system from the manufacturer to your home. It is your responsibility to make sure that you actually receive what you've ordered.



### When the delivery arrives, here's what you should do:

1. Don't sign before you've made a complete inspection.
2. Let the driver wait until you're done with the inspection. Ask him or her to give you a few minutes to make sure that the shipment is complete and in good condition.
3. If the driver fidgets, ask for his or her name and base location, just to put him on notice that you're not intimidated. You can be professional, but firm.
4. Check the outside of the packaging. Dents, holes, tears, cuts, or creases are all considered damage. If you see signs that the package has been cut or crushed, that may already indicate trouble inside. Even if the unit itself looks intact, there could be mechanical problems caused by careless handling.
5. Note the outside damage on the delivery receipt.
6. Open the package and remove the contents. Itemize and count. Compare the bill of lading against the actual contents.
7. Take note of any damaged, missing items, or discrepancies on the delivery receipt. If you don't specify that the goods arrived in a compromised condition, you wouldn't be able to reimburse for the damaged merchandise and freight charges.
8. Keep all the packaging just in case the freight company demands proof of damage.
9. Take photos of the packaging and contents.
10. Refuse receiving the shipment if the damage is noticeable. Accept only the pieces that are in good condition and refuse any damaged ones.

Remember the expression FOB or Freight On Board, which means that the factory or supplier is no longer responsible after the carrier accepts the merchandise. And once the carrier accepts the package, it is between the carrier and the consignee (that's you) to work out any problems. If you accept the package and then discover later that some parts are damaged, it is called concealed damage. You have just five days to report concealed damage to the carrier; after that time, you forfeit your right to file a claim.



## HOW MUCH TIME YOU'RE ALLOWED TO INSPECT THE SHIPMENT?

Remember that freight companies allow a specific amount of time for inspection (the time is based on the weight of the package). You have the right to insist on taking the time for inspection. Some of the time limitations for specific freight carriers are the following:

- FedEx Freight: 30 minutes for shipments that are less than 2,500 lbs.
- Yellow Freight: 15 minutes for shipments that are less than 1,000 lbs. and 30 minutes for shipments that weigh between 1,000 lbs. and 2,500 lbs.
- Roadway: 15 minutes for shipments that are less than 1,000 lbs. and 30 minutes for shipments that weight between 1,000 lbs. and 2,500 lbs.

## HOW SHOULD YOU PREPARE FOR A CURBSIDE DELIVERY?

Even if the unit weighs several hundred pounds, remember that the driver is responsible only for delivering the goods to the property address. He or she is not required to hump it up the stairs to your condo or wheel it into the garage. For this reason, you might want to have a dolly at hand— or at least an extra helper.

## HOW CAN YOU FILE A CLAIM?

It's critical to open the shipment as soon as it arrives. You'll have 24 hours to report any damaged or missing items to the ComfortUp Customer Care. While we offer free shipping on orders over \$399, we can't be responsible for the damage that wasn't reported to us on a timely basis.

If you wish to return an item that's not damaged, here's the drill: Obtain a return merchandise authorization (RMA) from the ComfortUp Customer Care. We will then email instructions to you about how to package your return, as well as an address for the return shipment.



## PREPARING FOR INSTALLATION

### WHY IT'S BEST NOT TO SCHEDULE AN INSTALLATION UNTIL YOUR MINI SPLIT IS DELIVERED?

It is common practice to accept a mini split delivery, then forget about it until the installation date. Don't follow this pattern! If your installer arrives two weeks later and tells you that the coils were crushed during shipping, you'll have no recourse. In fact, we recommend that you should not schedule an installation until you've received the shipment. ComfortUp.com uses third-party freight carriers and their scheduling is not under our control. So the unit may not arrive before your installer is at the door.

## WHAT ARE THE THINGS THAT YOU SHOULD PREPARE PRIOR TO THE INSTALLATION?

1. Before the contractor knocks on your door, there are a few things that you can do to prepare for the installation:
2. Make sure that you have all the parts and pieces (line sets and other accessories).  
Make sure that the line set fittings match the connections on your outside unit.
3. Check for the maximum length of the cable between the two units that's recommended by the manufacturer. Heat pumps are charged by the factory for a certain length of interconnect; any length over that would alter the amount of required refrigerant.
4. Determine where the indoor unit and the outdoor unit should be installed.
5. Plan to have the indoor unit and the outdoor condenser unit be placed as close as possible to each other.
6. Choose a site for the outdoor condenser unit. Make sure that the location is not where it will get hit by snow shedding from the roof or rain from a downspout.
7. Lay a firm foundation for the outdoor unit, such as a plastic or concrete pad.
8. Check with your contractor to ask if you can do any advance work (such as tearing open a wall or removing a kitchen cabinet). It will save you money and the contractor's time. Since he or she is an expert on HVAC stuff, why not have him or her do the specialized work and you do the general carpentry— if you are so inclined?
9. Call your installer to schedule the job. You might give them a heads-up on when you expect the system to be delivered. Many companies appreciate knowing roughly when the client will be ready. That way the company can pencil in your job.
10. Plan ahead so you can be sure that you're at home while the installation is taking place. Your contractor may have questions for you, may need access to certain areas such as the basement, for instance, or may need your permission to run wires or pipes on certain locations.



## WHAT YOU SHOULD ASK FROM YOUR CONTRACTOR?

It is important to cover all the bases, so it would help if you will make a list of things that you need to ask from your contractor. You can actually ask them to:

- Show you how to change the air filter.
- Leave a few extra filters.
- Demonstrate the controls.
- Clarifications about a service contract for annual maintenance.
- Provide you with all the paperwork for the warranty and a basic primer on maintenance and operation.



## INSTALLING A DUCTLESS MINI SPLIT SYSTEM

### WHEN IS THE BEST TIME TO INSTALL A DUCTLESS MINI SPLIT SYSTEM?

Specifically, ductless mini splits are ideal to use in the following situations:

- You want a system for a room addition but your centralized ducted system cannot be extended without you making a costly structural adjustment.
- When you want to convert an area of your house, like a garage, into a new functional space, but there is no other way to link it with your existing HVAC system.
- When constructing a new home or remodeling a house and you are planning to have a system that will enable you to have more control over your comfort.
- When you are upgrading or replacing a part of your old HVAC system and you are looking for the best alternative, whether in terms of performance, energy-efficiency, or both.
- Your existing centralized air conditioning system is causing problematic temperature swings that result to some areas of your house always becoming too hot or too cold.
- Your live in an old house—and let’s say a historic old home—and creating a ductwork is not an option, not only because it requires a complicated work but also because it might damage the historic integrity of the house.
- You live in a temporary home and it is not financially practical to spend on a costlier HVAC system or you have no rights whatsoever to create some structural modifications.
- You need a high-performance and high-efficiency system that is easy to install and simple to operate.
- You are currently using a non-ducted system for your cooling and heating needs at home and now looking for the same thing, but this time, you want it to be more powerful, efficient, easy-to-install, and simple to operate.



### WHAT ARE THE ESSENTIAL TOOLS THAT YOU MIGHT NEED FOR A MINI SPLIT INSTALLATION?

Compared with the other traditional, ducted climate control solutions like a central air conditioning system, ductless mini splits are easier to install. But while it requires less complex procedures, it is highly recommended that you seek help from your licensed HVAC contractor. Professional assistance is important to prevent errors.

Keep in mind that improper installation will affect the reliability, efficiency, and overall performance of your unit. But if you’re willing to take the risks and do the job on your own, here are some of the basic tools that you need to properly install a ductless mini split system:

Hole saw	Vacuum pump
Wrenches (standard, adjustable, Torque, Allen)	Clamp on Amp meter
Pipe cutter	Safety glasses
Screw drivers (Phillips, Flat blade)	Work gloves
Drill with drill bits	Micron gauge
Level	Refrigerant scale
Manifold and gauges	R410A Flaring tool



## WHAT ARE THE SAFETY PRECAUTIONS AND IMPORTANT CONSIDERATIONS WHEN INSTALLING A MINI SPLIT?

Prior to installation, make sure that you properly observed the following safety precautions and other important considerations:

- Make sure that the electrical power is disconnected.
- Use a properly sized circuit breaker.
- Observe the local codes, laws, and regulations.
- Comply with all the installation requirements.
- Protect the unit at all times.



## HOW IS MINI SPLIT INSTALLED?

In a mini split system, the outdoor unit is placed outside the house and linked to the indoor unit which is mounted inside your home by a set of piping and wiring systems. These are usually passed through a small hole in the wall (usually just a 2 ½-inch hole or a 3-inch hole), linking both units as one single system. The pipes are usually the cooper tubing called line set or refrigerant lines, while the wires are usually the electrical wiring system that connects the unit to a power outlet.

The line set of a mini split consists of suction line, which is the bigger pipe that connects the evaporator outlet and the compressor inlet, while the liquid line, which is the smaller copper pipe, connects the condenser to the expansion valve.

Take note that with a ductless system, you can connect multiple air handlers (usually up to 8 air handlers) to just one compressor.

### Indoor Unit Installation

1. Choose the most suitable location where you will install the unit. It should be a place that is easy to reach and where the unit can be easily accessed. Avoid mounting the unit in an area that is within reach of children, directly exposed to the elements, where airflows will be obstructed, and where the unit itself can obstruct movements.
2. When you've finally determined the mounting location, determine the correct area where you will drill a hole for the refrigerant lines.
3. Position the mounting bracket on the desired location on the wall. Keep in mind that the unit must be installed horizontally.
4. Using the level tool, make sure that the mounting bracket is level and then mark the exact points where you will drill the mounting holes.
5. Determine the exact points where you will drill the wall hole in the side of the unit. Also, determine the size of the hole.
6. Verify the exact length of the piping system and make sure that it has the proper length to connect the indoor unit and the outdoor unit.
7. Drill the mounting holes and then check if the mounting holes of the unit are perfectly aligned with the drilled holes in the wall.
8. Drill the hole in the wall for the piping system. When the hole is cut, insert a wall sleeve to protect the refrigerant pipes.
9. Weatherproof the surrounding area of the wall sleeve.
10. Attach the refrigerant pipes to the indoor unit. Make sure that the electrical cords are also secured.
11. Mount, press, screw, and properly secure the indoor unit to the wall.
12. Run the pipes, including the electrical cables to the hole in the wall and directly to the outdoor unit.

### Outdoor Unit Installation

1. Find a suitable location for the outdoor unit.
2. Mount and secure the outdoor unit on the desired location.
3. Pass the power cables and the refrigerant pipes from the hole in the wall and properly connect these line sets and wiring system to the outdoor unit.





## WHY HIRING AN HVAC CONTRACTOR REMAIN YOUR BEST OPTION?

While you can try installing the system yourself, some parts of the installation work—like with the refrigeration component—require sufficient license and certification, which most likely you do not have. Keep in mind that ductless systems are relatively new in the United States, and therefore, you need the expertise of the right professionals for this type of work.

Here are the other reasons why you need to let a professional handle the job:

- Most handy people (DIYers) are not certified to handle refrigerants.
- Your warranty won't go into effect unless you have a professional installation.
- If anything goes wrong, you have no recourse. You may still end up paying someone to come and straighten out what the DIYer did.



## MINI SPLIT MAINTENANCE

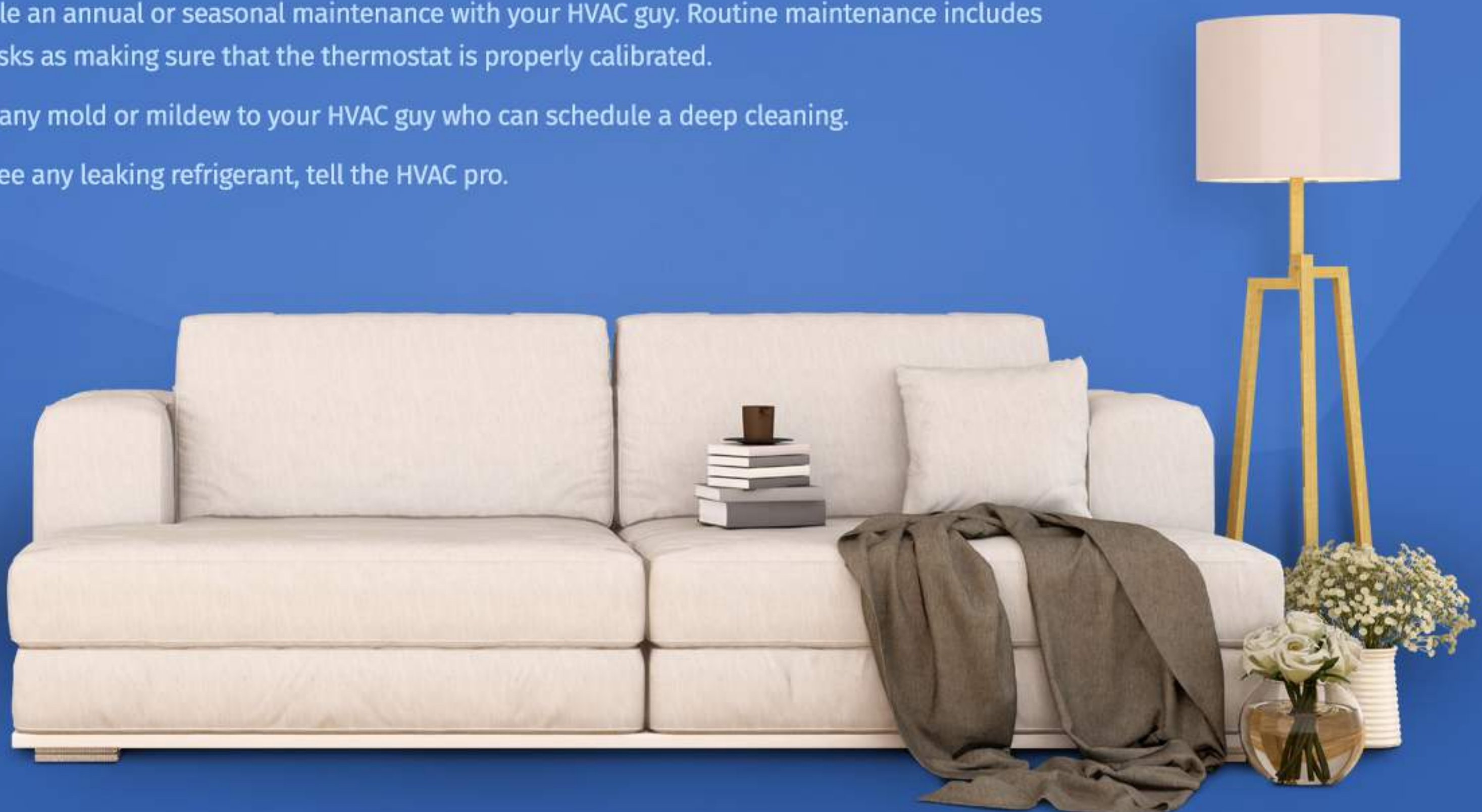
### WHAT ARE THE BASIC WAYS TO PROPERLY MAINTAIN A MINI SPLIT UNIT?

While proper installation is a major factor in determining the lifespan of your mini split, maintenance comes as close second.

One of the beauties of mini splits is they don't need much TLC. Not having ducts means not worrying about the loss of conditioned air through miles of piping. And not having to clean the ducts, and repair them, and replace them when they break or get twisted. Still, there are some fundamental principles and it wouldn't hurt to know.

To keep your mini split running as efficiently as possible, it pays to observe the following maintenance tips:

- Change the air filter regularly. If you have a washable filter, use a HEPA vacuum to remove the fine particles, or follow the manufacturer's directions for wet wash. Check for mold or mildew.
- Check the area around the outdoor condenser and remove any leaves, dirt, or debris.
- When you mow the lawn, take care not to send the cut grass towards the condenser.
- Make sure that the condenser is not vulnerable to snow or ice accumulation.
- Leave at least four feet of clearance around the outdoor unit.
- Check to make sure the unit is firmly planted on its base.
- Clean the coils by dusting them off once in a while— especially if you live in a dusty neighborhood. Make sure that there is an unimpeded air flow across the cooling coils in the indoor unit and around the outdoor condenser.
- Use a garden hose to gently spray the coils, holding the nozzle at a slant angle.
- Clean the cooling coil with a soft cloth.
- Schedule an annual or seasonal maintenance with your HVAC guy. Routine maintenance includes such tasks as making sure that the thermostat is properly calibrated.
- Report any mold or mildew to your HVAC guy who can schedule a deep cleaning.
- If you see any leaking refrigerant, tell the HVAC pro.





## WHY YOU SHOULD REGULARLY CLEAN YOUR MINI SPLIT UNIT?

Just like your other appliances and mechanical devices at home, your installed ductless mini split system can accumulate dirt, dusts, molds, and grime. Long-use and exposure to elements impact their physical integrity and affect their efficiency and performance in the long run. Cleaning the unit regularly will help keep it more smoothly and efficiently. Consider this task as an important type of preventative maintenance that will help extend the life of your unit and save you money on costly system replacement. While you can certainly avail of cleaning services from an HVAC professional, it is important to note that cleaning your mini split unit is not hard at all. It is a simple chore that you can easily accomplish on your own.

## WHAT YOU SHOULD DO BEFORE CLEANING A MINI SPLIT UNIT?

Before you clean a mini split unit, you have to observe a couple of pre-cleaning procedures, prepare some cleaning materials, and follow certain steps. These include the following:

1. Turn the unit off. Safety is very important, so before you do anything at all, you might want to make sure that your ductless mini split unit is not turned on or not connected to any power supply. If a circuit breaker is used, you can start by switching it off. For good measure, you can also check the power cable and unplug it from the outlet or the main electrical panel to shut the system off entirely.
2. Make the cleaning materials available. Cleaning your ductless unit doesn't have to cost you much. Your cleaning materials may have to include a combination of items that you readily have at home and items that you might have to buy if they're not available in your home.

## WHAT CLEANING MATERIALS SHOULD YOU PREPARE OR BUY BEFORE CLEANING A MINI SPLIT?

The common items that you can certainly get at home are a damp cloth and a dry cloth, leather gloves, shop vacuum, soap, household cleaners, water, and water hose with sprayer or water spray. The items that you might have to purchase are fin comb, air conditioner coil cleaner, cleaning brush, spray bottle, wash bag, scrubs, condensate drain pump treatment, and a condensate drain cleaner among others. Use these materials as you see fit.

## HOW TO CLEAN THE OUTDOOR COMPRESSOR/CONDENSER UNIT OF A MINI SPLIT?

To effectively and properly clean the outdoor compressor unit, you can do the following steps:

1. Clear the debris around the unit. Clean the surrounding area of the unit. Remove the dry leaves, twigs, grass, and all objects that you can find anywhere near the unit.
2. Wash the outdoor cabinet. Wash the outdoor cabinet with a damp cloth. You can use soap and water and rinse afterward. Dry the housing with a dry cloth.
3. Remove all the dirt that get collected in the exterior of the unit. Remove by hand all the debris that are found in the unit. When large objects are removed, use the water hose or water spray to clean the unit so you can remove all the dirt in the exterior surface. You can use soap and water for cleaning.
4. Scrub and wash the grille or fan cage. Spray the grille with water and remove as much as possible all the dirt that accumulated in the grille or fan cage. You can use a brush to scrub the whole surface.
5. Clean the fan blades. If you can unscrew the grille, remove it. You will find the blades inside. Clean the blades with a damp cloth. You can use soap. Rinse afterward and wipe the blades with a dry cloth.
6. Clean the interior of the unit. Check the inside of the unit and remove all the dirt. Use the dry cloth to clean the interior surface. You can use a vacuum to remove the dusts and other dirt inside.
7. Clean the condensate pan. Check the condensate pan and remove any growth of mold. You can wash it with soap or use a bleach solution. Rinse with clean water afterward.
8. Clear the drain hose with dirt. Check the drain hose and remove all objects that might block the free flow of water. Wash it with soap and clean water.





## HOW TO CLEAN THE INDOOR AIR HANDLER UNIT OF A MINI SPLIT?

To effectively and properly clean the indoor air handler unit, you can do the following steps:

1. Clean the exterior surface of the air handler. Wipe the air handler unit with a damp cloth and immediately dry it with a dry cloth.
2. Remove and clean the air filters. Remove the air filters from the unit and remove all the dirt. You can wipe them with clean and dry cloth or wash them with soap and clean water. Either way, you should make sure that you consulted the owner's manual and followed the stated correct way of cleaning the filters. Also, keep in mind the frequency of cleaning the filters so you would know when to clean it again.
3. Clean the evaporator coil. Remove the unit's cabinet to have an easy access to the evaporator coil. Clean the coils by removing all the dirt and the accumulated molds. You can simply wipe it with a clean dry cloth or use a coil cleaner for more effective results.

## AIR FILTERS OF A MINI SPLIT

### WHERE CAN YOU ACCESS YOUR MINI SPLIT'S AIR FILTERS?

Your mini split's air filter is commonly found in the return air duct or grille of the air handler. As is the case with many air conditioners, it is placed in a specific slot that can be easily accessed, which is typically on any side of the return air part of the unit (depending on the type of system).



### WHY ARE THE AIR FILTERS IMPORTANT?

The air filters of mini split unit serve two main functions:

1. They protect your unit by screening out dirt particles that affect the efficiency and performance of the system, especially when they begin to clog the internal components, restrict airflow, and force the system to work even harder and use more energy in the process.
2. They help keep your indoor surroundings free from airborne pollutants and viruses that affect the quality of air inside your home and might cause some health issues for your family.

### WHAT ARE THE DIFFERENT TYPES OF AIR FILTERS?

Filters come in a variety of types. For your air filter options, here are some types of commonly used air filters:

**Fiberglass air filter.** A very common type of air filter, a fiberglass filter is usually made of layered fiberglass and reinforced with some metal mesh or grating for support. This works great in screening out large particles.

**Washable air filters.** Highly effective in blocking air pollutants, washable air filters are obviously cost-effective. You just need to clean them regularly. You can simply wash them with water—no hassles at all and the best thing is, you'll no longer need to worry about costs related to air filter replacement. As long as you are able to maintain their quality, these filters can last and be useful for many years.

**Electrostatic air filter.** This is a washable air filter that is known for having very little impact on airflow. It works through electrostatic attraction or by using static electricity in removing particulate matter in the air. While one of the biggest drawbacks of this filter is their capability to generate ozone, it remains one of the best furnace filters available.

**Ionic air filters.** By using negatively charged ions to attract airborne particles, ionic air filters are certainly one of the most innovative air filtration technologies. They purify indoor air and remove a high percentage of air pollutants inside your home or any commercial facility.

**UV light air filters.** By utilizing the reaction generated from the exposure of titanium dioxide to an ultraviolet light, UV light air filters are able to neutralize and eliminate airborne particles.

**Disposable air filters.** Considered as economical, disposable air filters can be of any type (pleated, fiberglass, etc.), useful in all kinds of filtration, and applicable for residential or industrial applications. The only drawback is, while these filters are cost-effective, they need to be disposed of immediately when no longer effective. Nonetheless, they certainly work wonders if you're using it for light duty air filtration.

**HEPA (high-efficiency particulate air) filters.** Considered one of the most effective air filters, HEPA filters are made of fiberglass fiber mats and popularly used in sensitive filtration applications which are typical of what is needed in medical facilities where containment of airborne particles is very important. In home application, this is very effective in ensuring that you're protected from airborne viruses, especially if someone in your family suffers from allergies. HEPA filters can effectively trap and screen out at least 99.97% of airborne pollutants.

**Pleated air filters.** Also called extended surface filter, pleated air filters consist of pleated fabric (cotton or polyester) and is deemed one of the most efficient in removing small airborne contaminants. The pleats or the folded fabrics enable the air to effectively and easily pass through, a characteristic that makes pleated air filters highly efficient.

**Carbon air filters.** A new air filtration innovation using old technology, carbon air filters are highly effective in removing airborne pollutants and deodorizing air. It works through adsorption or by using oxygen to activate carbon (basically a charcoal), enabling it to absorb the vapors that cause bad odors through its highly absorbent pores.



## IN WHAT ASPECTS DO AIR FILTERS DIFFER?

The demand for better indoor air quality and the widely popular adoption of an array of guidelines and requirements for air filtration technologies have consequently pushed the production of enhanced air filters for air conditioners. Today, you'll find that there are many kinds air filters for HVAC systems. Some air filters can be washed and reused while others need to be occasionally replaced. Basically, air filters vary in so many ways, but more specifically, in terms of type of filtration method, material component, appearance, application, and filtration capability.



## HOW CAN YOU MEASURE OR DETERMINE THE EFFICIENCY OF AN AIR FILTER?

The best way to measure the efficiency of air filters is to look at their Minimum Efficiency Reporting Value (MERV). MERV ratings range from 1-20, with one being the lowest and 20 the highest. Each rating says about a particular type of contaminant that can be controlled and a specific application. Carpet fibers, for example, is assigned with the lowest rating 1, and the filter is suggested to be best to use for minimal filtration work in a residential environment. The highest rating 20, on the other hand, pertains to highly harmful compounds from hazardous chemicals.

## HOW DOES MERV HELPS?

With so many methods of air filtration, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) took the initiative of providing a rating system that evaluates, judges, and rates air filters in terms of their capability to filter air. Technically, it helps you know how effective the air filter is in screening out airborne particles.

## HOW TO CHOOSE THE AIR FILTER WITH THE BEST MERV?

One thing that you should remember is that the highest the MERV rating, the smaller the size of airborne particles that a filter is capable of removing. But when you're choosing for a good air filter for your mini split unit, the higher MERV is not always the most ideal. High-MERV filter usually means you're using a filter with very small breathing room, which affects the airflow of the unit. To effectively choose the right filter with the correct MERV for your system, you need to consider the specific environment that you want to cool. Your HVAC contractor would be a great help in this aspect if you're not sure what to choose.

## WHY HAVING A GOOD AIR FILTER INSIDE YOUR AC IS IMPORTANT?

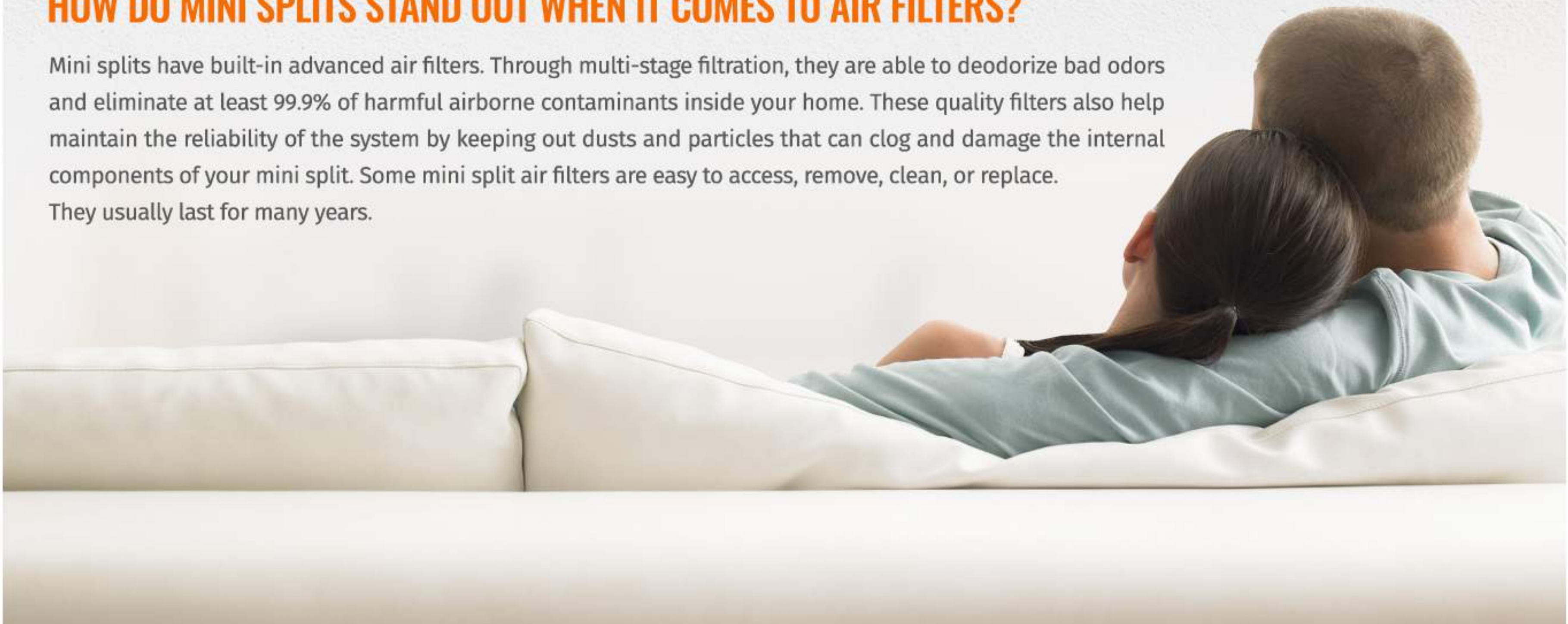
Believe it or not, the air you breathe inside your home is more polluted than the air that you get outside—at least 2 to 5 times greater, says the Environmental Protection Agency.

In fact, the airborne viruses that occasionally puts you under the weather is just one of the many pollutants that affect the air quality of your home. You can include on the list your pets' dander, the exhaust fumes from your kitchen, the toxic substances from the cleaning products that you use at home, tobacco smoke, dust mites, pollens from plants, molds, and bacteria among others. The lack of fresh air supply that enters your air conditioned home only aggravates the buildup of these pollutants. Not surprisingly, EPA declared indoor air pollution as one of the top five environmental health risks.

Certainly, there is a real challenge in maintaining a healthy indoor air, but keeping your air clean at home is not as hard as you might think. Ensuring that you have the right air filter for your air conditioner can actually make things work and help improve your indoor air.

## HOW DO MINI SPLITS STAND OUT WHEN IT COMES TO AIR FILTERS?

Mini splits have built-in advanced air filters. Through multi-stage filtration, they are able to deodorize bad odors and eliminate at least 99.9% of harmful airborne contaminants inside your home. These quality filters also help maintain the reliability of the system by keeping out dusts and particles that can clog and damage the internal components of your mini split. Some mini split air filters are easy to access, remove, clean, or replace. They usually last for many years.





# DUCTLESS MINI SPLIT COMMON ISSUES AND SIMPLE TROUBLESHOOTING TIPS

## WHAT TO DO WHEN THE UNIT WOULDN'T TURN ON?

When this happens, always check first the power supply. It's possible that the power plug is not connected to the power outlet or the circuit breaker is tripped. Check these two things before anything else.

If you're turning the unit on using the remote controller and it's not working, the battery may be the problem or the controller itself. More often than not, it's the former. To check if this is indeed the case, you can try turning the unit on from the main unit itself or from the thermostat device. You can do it vice versa. If you are turning the unit on through the thermostat and it's not working, then you can also try checking if it works through a remote controller.

If the unit is turned on through the controller, the thermostat device may be broken or encountering an error in terms of connecting to the main AC unit.

If both the remote controller and the thermostat can't be used to turn on the unit, the most likely error is in the system itself.



## ARE THERE ANY OTHER CAUSES OF YOUR UNIT'S FAILURE TO POWER ON?

The usual case is, when the unit wouldn't turn on, either your unit was disconnected to the power supply, the circuit breaker is tripped, or the controllers have a battery problem.

Other serious causes are possible, such as failed capacitor or burnt out compressor, but these things may already require technical help from a professional, and sometimes, a parts replacement.



## WHY DOES YOUR UNIT EMITS FOUL ODOR?

When your ductless AC starts to emit an unpleasant odor, it's most certainly a sign that your unit is dirty inside. It indicates that there is already a growth of dirt, mold, and mildew within the unit.

The fact that you already smell a nasty odor means that the problem is serious enough to the point that these foul-smelling dirt have already contaminated the air that circulates inside your room.

To understand the source of this odor, you need to know that your ductless air conditioner works by absorbing the warm air from inside your room. This warm air passes through cool evaporator coils, causing condensation to happen. This produces condensate or moisture, which is basically a water. This water drips into the condensate drain line down to the drain pan.

The problem occurs when the coils and drain pan become clogged with dirt due to overuse and poor maintenance. Naturally, when a condensate water is mixed with dirt, it causes mold to develop. Additionally, the clogged dirt prevents excess moisture to drain properly.

With mold and stagnant water collected inside the system, it's only a matter of time before it develops a foul smell.

When your ductless system emits foul odors, it becomes an air filter issue. It means that your unit's air filter is already too dirty and clogged up with dirt. As a result, it is no longer effective in screening out dirt that goes inside.

## WHAT SHOULD YOU DO IF YOUR UNIT EMITS FOUL ODOR?

What you can do is to simply clean the air filter and the condensate drain line and pan. Most ductless mini splits usually come with washable air filters, so these would be an easy task without any extra expense on your part. If the filter is not washable, you can just buy a replacement at a small cost.

## HOW TO PREVENT YOUR UNIT FROM EMITTING FOUL ODOR?

To avoid having to deal with a foul odor coming from your mini split, you just have to clean the air filter regularly. Washing them with soap and water will go a long way to make these filters last for many years.

To ensure the efficiency of your system, don't forget to follow the manufacturer's recommendations when it comes to cleaning or replacing the air filters.



## WHAT TO DO IF YOUR UNIT GENERATES ABNORMAL NOISE WHEN IN OPERATION?

Mechanical devices like air conditioners normally produce noise. But unlike conventional AC systems, a ductless AC typically operates quietly. They produce a sound while in operation, but very quiet.

When your ductless AC unit starts to produce an abnormal noise, such as a loud clanking, rattling, banging, squealing, humming, thumping, or screeching sounds, then it means that there is a problem within the system.

Most likely, the cause of abnormal noise that comes from the unit is a bent or dirty fan blade, loose cabinet, or there may be some debris inside that's causing friction with other components. A simple clean up and tightening of those loose parts will do the trick.

## WHAT'S THE LIKELY REASON IF YOUR UNIT IS NOT BLOWING ENOUGH CONDITIONED AIR?

Many things can actually happen inside the ductless mini split system that may result in a poorly distributed conditioned air. But this is a very common problem.

A dirty unit is one of the usual causes. Dirt can easily accumulate inside your system, whether in the outdoor unit or in the indoor unit.

One of the other possible reasons is a low level of refrigerant in the system. When this happens, the likely cause is a leak. A repair of the leak and recharging of refrigerant may require you some professional help.

## WHAT SHOULD YOU DO IF YOUR UNIT IS NOT BLOWING ENOUGH COOL AIR?

Your best course of action is to check both the indoor and outdoor units and try to clean most if not all of the dirt that you can find.

In the indoor unit, you can start by cleaning or replacing the air filter. You can also clean the fan if it is accessible.

In the outdoor unit, some dirt and debris such as twigs and leaves may be blocking the smaller mechanisms inside, which is preventing the system from properly working in terms of distributing air.

When this is the case, try to clear the unit with any kind of obstruction. You can also clean the surrounding area.







# SAVING ENERGY

## HOW TO SAVE ENERGY FROM USING YOUR UNIT?

Your cooling solution is responsible for a large chunk of your energy consumption at home. To cut your cooling costs, consider fixing, replacing, installing, and using things that can prevent your unit from working doubly hard and consuming more energy than needed. Here are a few things that you can do:

- Check your unit if it needs some repair or replacement. Sometimes, a faulty component or even a dirty filter forces the system to work a little bit harder and consume more energy than needed.
- Properly insulate every area in your home where an AC is installed to prevent the warm air from coming inside. Otherwise, your unit will have to work double-time when cooling the space.
- If you have windows that are directly exposed to sunlight, consider putting up some extra shade, whether it's a curtain or a tinted film for windows.
- Turn off the lights that you don't really need inside the room. They generate heat.
- If you think there's a need to replace the entire unit, then choose a high-efficiency system.
- If you don't have a thermostat, it's time that you buy one. It will not only help you control the temperature, but also manage your energy use.
- Utilize the fans. Even if you set the thermostat for a higher temperature, the air from your less-energy-consuming fans will help lessen the impact on comfort.
- Only use the AC when needed and set it at the most ideal temperature in which you can save more energy.

If you think there's a need to replace the entire unit, then choose a high-efficiency system. And most importantly, only use the AC when needed and set it at the most ideal temperature in which you can save more energy.

