Pearland
AC Repair Pros

HVAC 101

A Homeowner's Guide

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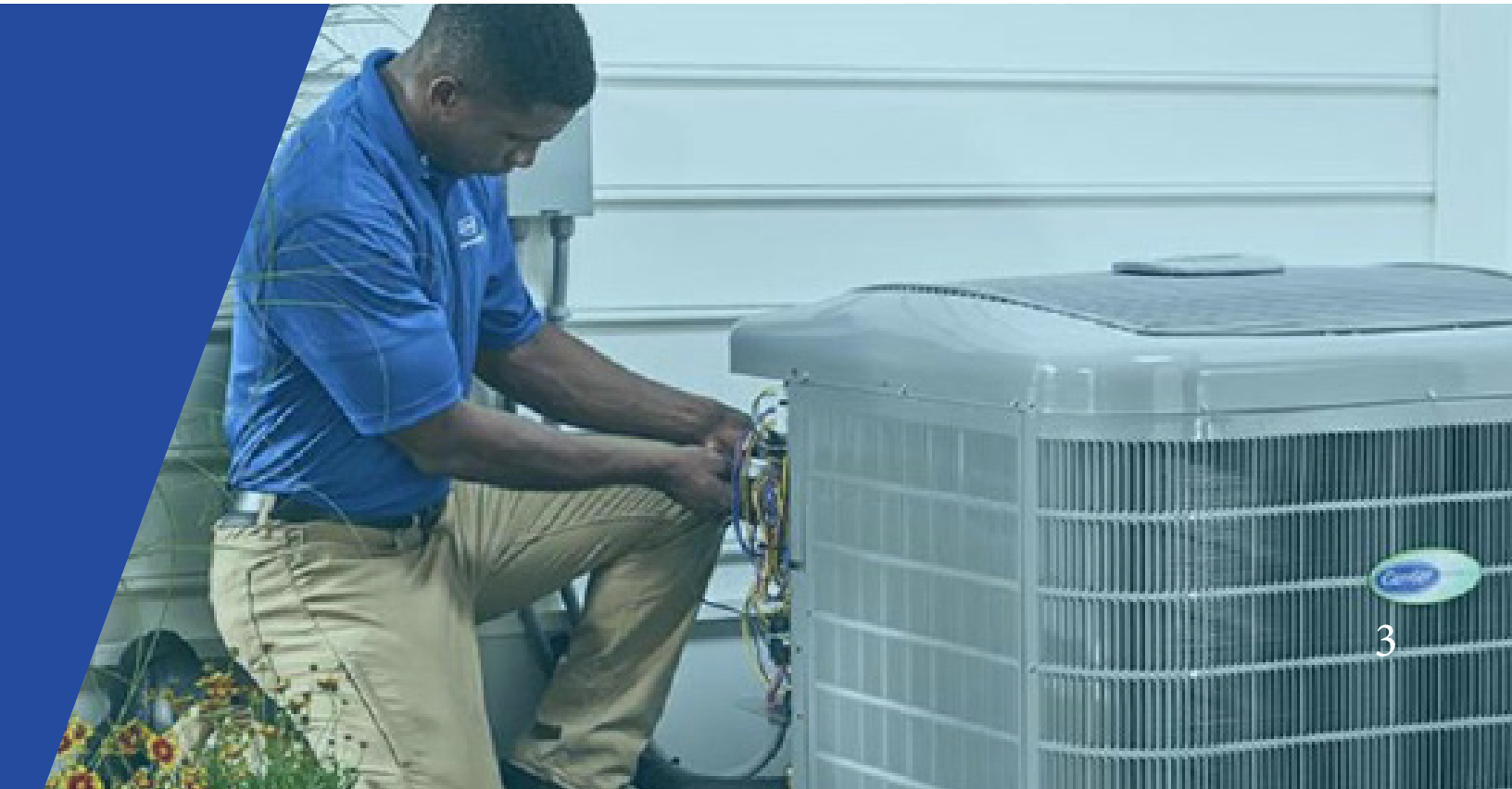
Understanding a Home's HVAC System

If you've ever spent a cold winter huddling under a pile of blankets or a hot summer coming up with any reason to open your refrigerator to cool down, you know the importance of proper heating and cooling in your home.

Living anywhere that has extreme temperatures means that if your heating or cooling doesn't work properly, you and your family could have to live through uncomfortable or even dangerous conditions.

Investing in a properly running heating, ventilation, and air conditioning (HVAC) system can make a huge difference in the comfort and safety of your family, and even the equity of your home.

Read on as we dive in to some of the popular types of heating and cooling systems found in homes, tips on how to keep them running efficiently, what to look out for to know when it's time to replace an aging system, and of course, how to find the right person to help you get your system running efficiently.



HVAC 101

The Fundamentals of Your Home's Comfort System

We often take for granted that our cozy home lets us escape cold winter's nights and the heat of a sunny summer day. That thermostat is usually a "set it and forget it" type task, and we expect our equipment to work all year round to keep us comfortable. That's why it often causes panic when our HVAC equipment shows us warning signs of trouble.

Homeowners that take the time to learn the basics of how their HVAC system works will help quiet the panic and instead give that homeowner a knowledge of what their next steps are to get their home to a comfortable place again.

What is HVAC?

Your HVAC keeps your home comfortable by regulating temperature, humidity, and air quality. The term “HVAC” is an acronym that stands for:

Heating

Air Conditioning

Ventilation

HVAC Basics

Next to your water and plumbing, your HVAC system is likely the most important asset to your home. In the U.S., homeowners spend more than $11 billion per year on the monthly costs to heat and cool their home, a very significant investment.

HVAC equipment often depends on your location: for most of the country, a central air conditioner and furnace combination is common while in warmer climates heat pumps/air handlers and packaged units tend to be more prevalent.

HVAC systems can heat and cool many different types of homes, though not all systems will work for your situation. They can be used to heat and cool residential buildings, privately owned buildings, and even a houseboat if that's what you need. These systems are versatile, but you will want to choose the proper one for your living situation for the best results.

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energy.gov

Types of HVAC Systems for Your Home

A new HVAC system is an expensive purchase, so it's important to make sure you have all the facts before making a decision. There are several different options of systems when it comes to keeping your home comfortable. Each of these systems are best suited for certain environments so you can find the one that best suits your home or business.

1

Heating and Cooling Split Systems

This is the most common type of HVAC system. This is perfect if you live somewhere with intense seasons. It will keep your house dry and cool in the heat of the summer and evaporate the moisture in the air when it's humid, but it will also keep your house warm and cozy in the winter. This system consists of two separate pieces, a furnace inside of your home, and an AC unit typically placed outside. Both of these units are usually controlled by a thermometer within your reach. They are easy, convenient, so they are one of the most common systems to have in a new home.

2

Hybrid Heat Pump System

In this system, there is a heat pump powered by electricity and used in conjunction with a furnace. The heat pump is the primary source of heating and cooling, but when the temperature drops below a certain temperature, the furnace kicks in to produce heat. This is great when you need an AC, but it doesn't dip below 40 degrees very often.

3

Package Heating and Air System

You will typically find this option in homes too small for a system or an office space that does not have room for an extensive HVAC system. These systems are great for cooling vast spaces. Instead of being split into two systems, it comes as one system that can sit on the roof or even the building's side and can be controlled from the inside. This heating system is a huge space saver and can be an excellent option for larger companies or apartment buildings. Packaged heating and air systems only take about a day to install and can be much easier to maintain. If you live in a place with storms, this may not be the best option for you. This type of HVAC unit can be easily damaged by weather. This could mean you will pay a lot of repairs over time.

4

Ductless AC Systems

This setup is a bit unique because several small AC units are organized in each room, typically on the walls. Each of the remote units connects to a compressor located outside. All of them can be controlled by a thermostat. However, this allows you to cool one room at a time, keeping it at different temperatures. If you have a small family and only use one room, this is a good way to save energy by heating and cooling the parts you use the most. There are many benefits to this system, but the biggest drawback is the initial cost. However, this could help you save thousands of dollars throughout the years by only cooling the necessary rooms instead of the whole house.

How Does an HVAC System Work?

Your HVAC system has many moving parts—understanding what goes into your HVAC system can help shed some light on how and why it's important for your home. Learn how HVAC works by reading about the anatomy of the parts of an HVAC system.

1. **Thermostat:** Of course you're familiar with your thermostat—it's where you set the temperatures that keep you comfortable in your home. Usually installed on an easily accessed walls, it can be set manually or programmed to keep your home at your ideal temperature. When the ambient temperature gets too hot or cold, the thermostat triggers your HVAC system to start circulating air as needed.

2. **Furnace:** Out of all the components of your HVAC system, your furnace requires the most space, and it's one of the most important components. The furnace is designed to heat air, which is then distributed to different portions of your home via ductwork or piping. Furnaces use varied heat sources, including solar energy, heat pumps, electric resistance, and combustion.

3. **Evaporator coil:** The evaporator coil is used to cool down the air when your thermostat is set to a lower temperature. This cold air is then funneled throughout your home.

4. **Condensing unit:** This unit is found on the outside of your home and filled with refrigerant gas. When the refrigerant is cooled, the condensing unit pumps this liquid to the evaporator coil to be transformed into gas again.

5. **Vents:** These are the outlets that help distribute heated and cooled air from the duct system into the various rooms of your home. Depending on your system, vents are generally found in the ceiling or in the floor, with angled slats designed to send the air where it needs to go. It's important to keep the vents open and clear to get the most out of your HVAC system.

6. **Refrigerant lines:** These lines carry refrigerant to the condensing unit in the form of gas. This gas is transformed to liquid form, then transferred back to the evaporator coil.

Common HVAC Repairs

Since your HVAC is a complicated system that is interconnected, it's important to always consult a professional if you think there are any issues to avoid any problems in the future. Here are a few of the most common problems areas to check before calling a pro:

1. **Malfunctioning Thermostat:** This is one of the easiest and simple fixes. If your thermostat isn't showing anything you need to invest in a few batteries and you'll be good to go—this is the most common issue with the thermostat.

2. **Tripped circuit breaker:** Reset your breaker box to make sure the breaker isn't being overloaded with other things. If it trips frequently, you might want to call an HVAC professional.

3. **Blown fuse or transformer:** If your transformer or fuse is blown, it will need to be replaced, but it's much cheaper than a whole new HVAC. For this, it will be best to call an HVAC professional at this point.

4. **Dirty coils:** If the air coming out of your vents isn't as cool as you'd like, it could be due to dirty coils. This is generally due to a lack of maintenance. When they get dirty, they don't remove heat properly and circulate hot air.

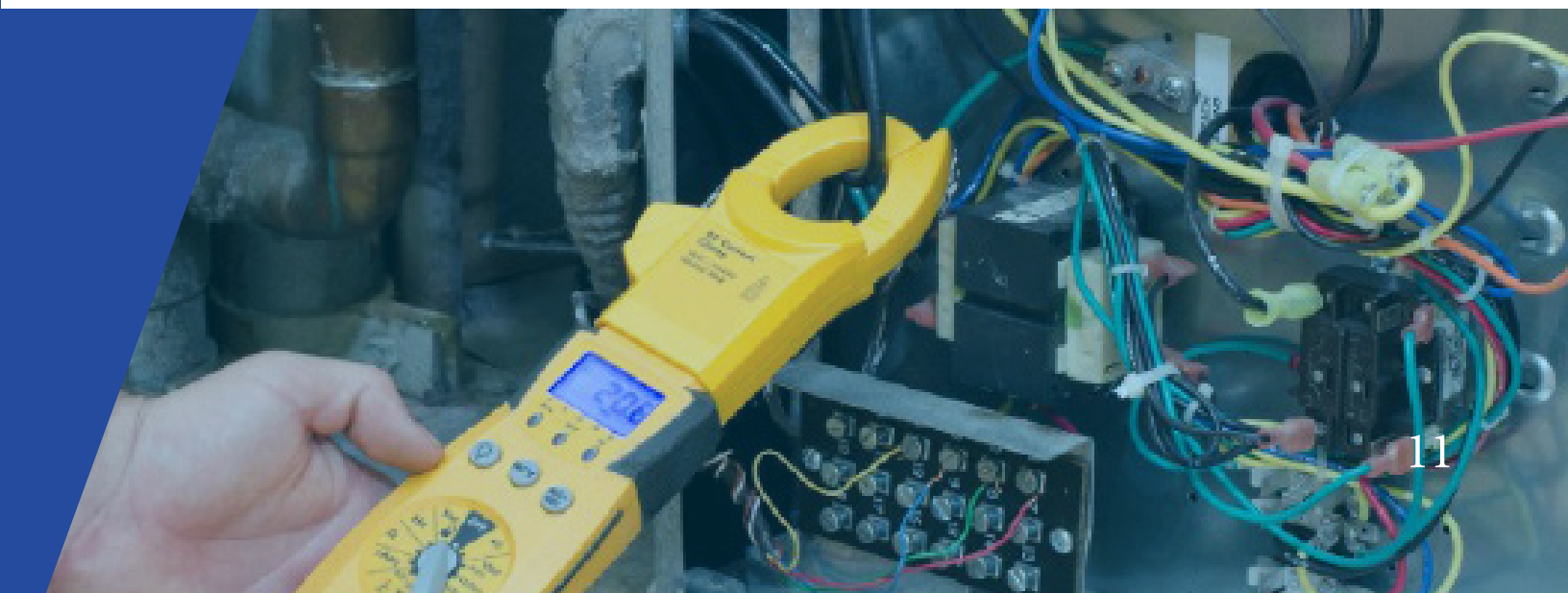
5. **Clogged air filter:** Air filters need to be changed regularly because clogged filters can freeze up and stop working entirely.

6. **Damaged Components:** Check the actual unit itself to make sure it hasn't been damaged. Many things can damage your outdoor system—weather, landscapers, falling tree limbs, no HVAC system is impenetrable.

How Long Does an HVAC System Last?

Even with good maintenance practices, HVAC machinery can only last so long. There are several different factors that go into projecting how long a system should last. Here's a general rundown of how many years of service you can get out of different parts.

- **Gas Furnaces:** 20 to 30+ years for gas furnaces. Usually replaced when heat exchanger begins to leak.
- **Oil Furnaces:** 10 to 15 years, due to maintenance issues that arise from usage of less efficient fuel.
- **Boilers:** 20 to 35 years, also usually replaced as heat exchanger begins to fail.
- **Air Conditioners:** 10 to 20 years, shorter in coastal climates. Needs replacement after compressor or condenser failure.
- **Heat Pumps:** 10 to 20 years, shorter in coastal climates.
- **Mini Splits:** 10 to 30 years, shorter in coastal climates.



Signs It's Time to Replace Your HVAC System

If you're having trouble with your HVAC system, sometimes a small repair or maintenance might be sufficient, but if your system is at the end of its life expectancy, it may be time for a replacement. Here are some clear signs that will help you determine if your system needs a complete replacement.

1. **Your repairs are outweighing the price of a new system.** If your AC or furnace is out and you're wondering whether to repair or replace, it mostly comes down to numbers. If your system is getting up there with age and costs are more that 50% of a new system, it's probably time for a replacement.

2. **Your energy bills keep increasing.** While it's normal for utility bills to fluctuate with the season or with rate increases, if you notice your bills are increasing consistently, it could be a problem. This is usually because your system is starting to deteriorate and is working harder to maintain the same temperature.

3. **You have trouble maintaining your home's temperature.** Even if you keep your thermostat the same, you may start to notice your air conditioning is having a harder time keeping up. This is a sign that it is no longer powerful enough to get the job done and it may be time to replace.

4. **Change in air quality.** Part of the responsibility of an AC system is to provide proper ventilation throughout the home. If you notice more dust, dander, dirt, mold, mildew or humidity, your AC isn't doing its job.

5. **Weird smells or noises coming from your system.** Your HVAC should be relatively quiet and definitely smell free. If you smell any burning or hear sqeaks or grinding, it's a sure sign that your system needs attention ASAP.

Benefits of Replacing Dated Units

If you're ready to replace your old HVAC unit, it may seem daunting—it's not a cheap endeavor and it can be tough to find a trustworthy specialist for your installation. It's not all overwhelming and stressful, it can actually be a great change for your home. Replacing your unit can make your home safer, more energy efficient, and comfortable in the long run. Check out these benefits:

- **Saves you money on your energy bill –** the latest HVAC models are energy efficient, which means you're helping the environment, keeping your home comfortable, and saving yourself money.

- **Reduced noise –** New HVAC systems are almost silent. They are made out of high-tech sound absorbing materials to keep their motor noises to a minimum.

- **More "green" options –** High-efficiency HVAC systems use about a third less fuel as compared to older models which means you are reducing your carbon footprint and producing less waste.

- **More access –** Thermostats have come a long way in recent years. WIFI connected thermostats give you access to your home temps anytime, anywhere from your smartphone.

- **Higher resale value –** If you are planning to sell your home anytime soon, it's worth replacing your system. It improves the value of your home which will allow you to recoup some of the price of the system in a sale.

- **Tax credit –** In some areas, you can get a serious tax credit for disposing of old, inefficient systems and replacing them with high-efficiency options.

Things to Keep In Mind When Replacing Your HVAC

Chances are if you are replacing the HVAC system, you had one, and it is broken. Typically, you will have already called out a professional to look at your broken HVAC. They will tell you what kind of system would be best to replace it with. However, if you are getting a brand-new system, you will still need to keep these things in mind.

Heating Capacity
When replacing your system, you'll want to find out what the current heating capacity is and make the decision on whether it worked well for the size of your home. When you ask about capacity, it is measured in BTU, the amount of heat needed to raise one pound of water by 1-degree Fahrenheit.

Cooling Capacity
Like with the heating capacity, you will need to find an HVAC system with a capacity that fits your house and needs. Based on this information will determine the capacity you need for your home.

Energy Consumption
Heaters and air conditioners consume loads of energy. You will want to pay close attention to how much energy your HVAC system uses. It should perfectly fit your house, and your home should be sealed to get the best use of this device.

Keep It Maintained
Maintenance is super essential. Keeping it clean and running efficiently will save you on future costs and energy consumption.

How to Maintain Your HVAC System

If you want to keep your HVAC system in tip-top shape so that you can keep it running as long as possible, there are a few things you can do on your own between service calls. These tips will prolong your system while keeping it running at its optimal performance.

1 Change Filters Regularly

Your HVAC air filters are there to catch dirt, dust, and even harmful bacteria and chemicals that otherwise would be pushed into your home. Dirty filters lower your unit's efficiency and waste energy, so it's important to replace them every three months.

2 Keep an Eye on Your Thermostat

As the weather outside changes, the temperature in your home will fluctuate. If it is set too high or too low, it can be uncomfortable and cost you more money than it typically would. Use a programmable thermostat that allows you to set temps higher in the summer and lower in the winter, and that allows you to program when you are away at work or going to bed. This will save you money and keep your HVAC running efficiently.

3 Seal Your Home

This may seem like an extra step, but this tiny thing can save you hundreds of dollars air leaks can be a huge heating and cooling problem in many homes. Have your windows and doors inspected for damaged seals, cracks, and gaps. Replacing seals and adding caulk where needed to keep air from escaping or entering. Quality duct work and insulation can also add to energy efficiency so inspecting attics and crawl spaces of your home can be beneficial.

4 Indoor and Outdoor Maintenance

Keeping things clean in and around the house will help keep your HVAC running smoothly. Indoors, you'll want to keep an eye on air registers and make sure vents aren't blocked by furniture or drapery. Use drapes to let sun in or keep it out depending on how warm or cold you want it. If your air conditioning unit is outdoors, keep the area clean of leaves and twigs that could get stuck and hurt the unit.

5 When in Doubt, Call in the Pros

You can upkeep your HVAC system pretty well on your own, but it will be necessary to have a professional come and maintain it regularly. Your unit should be cleaned and inspected twice a year to help your system last longer, run more efficiently, and save you a bundle in repairs.

Common HVAC Myths

Myth: Closing the vents in empty rooms increase energy efficiency.

Fact: Closing vents increase the pressure in ducts and can cause leaks in the vent seams.

Myth: Turning the thermostat all the way down will cool my home faster.

Fact: Thermostats will just tell your system to turn on and off based on the temperature you've set it. That means, turning it all the way down will make it run longer, it won't get your temps down faster.

Myth: The bigger the HVAC system the better.

Fact: A system that's too large for your home will consistently cycle on and off which means you will spend more money to operate it and it will shorten the lifespan of your unit. Have a professional come in and measure your home and give you a recommendation for what you need.

Myth: Ceiling fans help cool spaces even when you're not in the room.

Fact: Ceiling fans don't actually heat or cool a room. Fans make people feel cooler because the breeze makes us feel more comfortable. Use fans only when you're in the room to supplement your HVAC system.

Myth: An energy efficient unit will automatically reduce my bill.

Fact: Of course, it's a great start! But if your home has leaky windows and doors or poor insulation, a new and efficient HVAC will do some good, but will not work at its optimal capacity.

Myth: My thermostat's location doesn't affect heating & cooling.

Fact: The thermostat is what checks the temp of your room, so it will affect when your HVAC goes on and off. If it's too close to a vent or window, it may throw your system off balance.

How to Choose an HVAC Pro

As a homeowner, there are a few things that you should be doing to maintain your HVAC, but aside from those basics, it's important to bring in the pros when it comes to anything more serious. Most jobs should be left to the professionals, but it can be tough to find the right HVAC company to meet your needs. Here are some tips for hiring a reliable HVAC company:

1 Do Your Research

When searching for an HVAC company, the choices can be overwhelming. Rather than choosing a company at random, take some time to do the research and get outside opinions. Ask friends and family for recommendations or check Yelp or Google for reviews. You can even go straight to the source and ask the company for references or examples of their work.

2 Check Licensing, Insurance & Permits

Most states require HVAC technicians to have licenses, proof of insurance, and workers compensation. Make sure when you're talking to a contractor, they meet the minimum standards required by your state so you'll be protected if anything happens. You will also need to check with the company if they pull building permits if they are needed in the county.

3 Choose a Professional with Experience

It's common to feel a little apprehensive about hiring an HVAC technician. If you're home alone, you're essentially inviting a stranger into your home without any prior knowledge of what you're going to get. When hiring an HVAC company, find one that hires only the most trusted, respected, and highly trained HVAC specialists. You don't become an HVAC expert overnight. Only companies that have put in the time and proven themselves over decades of work deserve to serve your home with stellar customer service and superior products.

4 Satisfaction Guaranteed

Have you ever paid someone for a service, and after they left, you weren't happy with the results? It happens. Make sure to choose a company that will stay on-site and make sure you're delighted before ever pulling away. As our valued customer, your satisfaction should be the top priority.

5 Look for the Perks

Some HVAC companies over deals on maintenance contracts and 24/7 emergency repairs to your HVAC system — these are the kind of perks that make a company stand out. You want to find a company that doesn't just give you the basic service, but will always be there whenever you need them.

Pearland
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Our Company: Pearland AC Repair Pros

There aren't many issues in life that you can predict, and a problem with your HVAC is one of them. Even with simple, routine use, there can be situations that arise on the weekends, during holidays, or in the middle of the night.

You need to have your 24 hour AC repair handled as soon as it happens. Make sure when the time comes, you have a trusted service to get ahead of major damage.

Contact our AC repair company in Pearland, TX to get a free quote and an inspection so you can make sure your family is safe and comfortable!