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Exploring Major Brands for Mobile Home Furnace Installations

Overview of HVAC needs specific to mobile homes

Choosing the right furnace for a mobile home is crucial, not only for maintaining comfort and safety but also for ensuring energy efficiency and cost-effectiveness. Filters in mobile homes should be replaced according to manufacturer recommendations **mobile home hvac replacement cost** condenser. Mobile homes have distinct structural characteristics that require specific heating solutions, which makes it imperative to select a furnace tailored to these unique needs. In this exploration of major brands suitable for mobile home furnace installations, we will delve into why selecting the appropriate unit is essential and highlight some leading options in the market.

Mobile homes often have limited space and different insulation standards compared to traditional houses, which means that installing an oversized or inadequate heating system can lead to inefficiencies and increased utility bills. A well-chosen furnace will effectively distribute heat throughout the home without straining resources. Moreover, safety becomes a paramount concern as mobile homes are more susceptible to issues like carbon monoxide buildup if ventilation is improperly managed. Thus, choosing a reputable brand with reliable safety features is non-negotiable.

One of the standout brands in this arena is Coleman. With a long-standing reputation in the HVAC industry, Coleman offers furnaces specifically designed for mobile homes. Their units are compact yet powerful and known for their durability and efficiency. They incorporate advanced technology that ensures optimal performance while reducing energy consumption—a boon for those looking to minimize their environmental footprint and monthly expenses.

Another noteworthy brand is Nordyne (now under the Nortek Global HVAC umbrella), which specializes in creating products tailored to manufactured housing needs. Nordyne furnaces

are lauded for their robust construction and ease of installation, making them a popular choice among homeowners and contractors alike. They offer models with varying efficiency ratings, allowing consumers to choose based on budgetary constraints without sacrificing quality or performance.

Goodman is another major player offering reliable solutions for mobile home heating requirements. Known for affordability without compromising on quality, Goodman furnaces come equipped with features such as variable-speed motors, which enhance comfort by providing consistent temperatures even during fluctuating weather conditions.

Ultimately, when exploring major brands for mobile home furnace installations, it is vital to conduct thorough research and consider factors such as size compatibility, energy efficiency ratings (AFUE), warranty options, and after-sales support. Consulting with HVAC professionals can provide invaluable insights tailored to individual circumstances.

In conclusion, selecting the right furnace for a mobile home extends beyond mere preference-it impacts daily living standards significantly. Brands like Coleman, Nordyne, and Goodman offer varied options that cater specifically to the unique demands of mobile homes. By prioritizing aspects such as energy efficiency, safety features, and space considerations in your decision-making process, you can ensure a warm and secure environment throughout colder months while enjoying peace of mind regarding operational costs and long-term reliability.

The mobile home furnace market is a specialized segment that caters to the unique heating needs of manufactured homes. These homes often require compact, efficient, and reliable heating solutions due to their design and space constraints. As winter approaches and temperatures drop, ensuring a warm and comfortable living environment becomes paramount for mobile homeowners. In this context, exploring the leading brands in mobile home furnaces provides valuable insights into which products offer the best performance, efficiency, and value.

One of the most prominent names in this industry is Coleman. With a long-standing reputation for quality and innovation, Coleman furnaces are engineered to deliver reliable heating while maximizing energy efficiency. Their models are specifically designed to fit within limited spaces typical of mobile homes without compromising on power or functionality. Coleman's commitment to durability ensures that their products withstand harsh conditions over time, making them a preferred choice among many homeowners.

Another significant player in the market is Nordyne, known for its dedication to developing cost-effective solutions tailored for manufactured housing. Nordyne furnaces offer easy installation with versatile venting options that cater to various home layouts. The brand emphasizes quiet operation and user-friendly controls, enhancing both comfort and convenience for residents. Additionally, Nordyne's focus on energy-efficient designs helps homeowners reduce utility bills while minimizing environmental impact.

Intertherm also stands out as a noteworthy brand in the realm of mobile home furnaces. With decades of expertise under its belt, Intertherm produces units renowned for their robust construction and high-efficiency ratings. The brand's attention to detail extends beyond basic functionality; it aims to provide seamless integration into existing systems with minimal disruption during installation or maintenance processes.

Finally, Miller has carved out a niche by offering advanced technology combined with traditional craftsmanship in its furnace lineup. Miller's range includes models equipped with smart features like programmable thermostats that allow users precise control over their home's climate settings. This blend of modern technology with dependable performance makes Miller an attractive option for tech-savvy consumers seeking both comfort and efficiency.

In conclusion, choosing the right furnace brand is critical when considering installation in a mobile home setting due to specific design requirements and space limitations inherent in these residences. Brands such as Coleman, Nordyne, Intertherm, and Miller distinguish themselves through innovative designs focused on reliability, efficiency improvements alongside ease-of-use features-making them top contenders worth considering when exploring major brands suitable for mobile home furnace installations today.

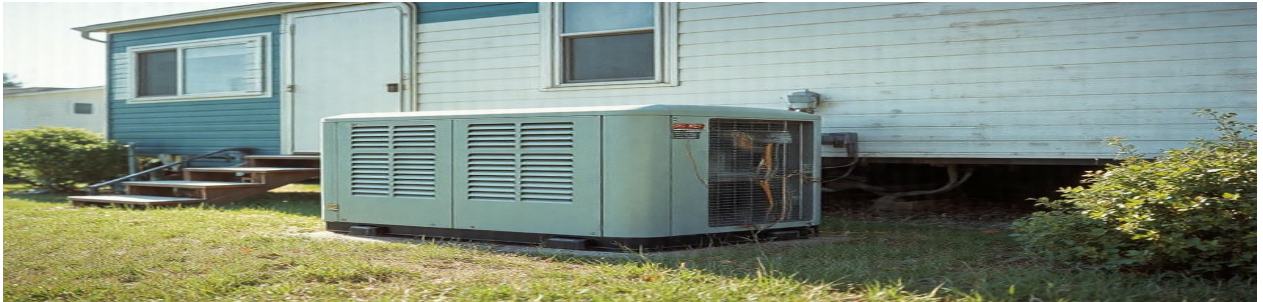
Affordable Payment Plans for Upgrading Mobile Home AC Systems



Choosing the right payment plan for upgrading your mobile home AC system is a crucial decision that can significantly impact your financial stability and comfort at home.. With numerous options available, it's essential to consider several factors to ensure you select a plan that aligns with your needs and budget. Firstly, assess your financial situation.

Posted by on 2024-12-30

Aligning Equipment Compatibility with Financing Options in Mobile Homes



In the dynamic world of mobile homes, aligning equipment compatibility with financing options is a crucial element that can significantly impact the success of any project.. The process involves ensuring that the equipment used in mobile home construction or renovation is not only technically suitable but also financially feasible.

Posted by on 2024-12-30

Understanding Financing Options for Mobile Home HVAC

When considering mobile home furnace installations, energy efficiency and performance are paramount factors that dictate the long-term satisfaction and utility cost-effectiveness for

homeowners. With a myriad of top brands available on the market, understanding how these brands compare can significantly impact decision-making.

First, let's explore the concept of energy efficiency in the context of mobile home furnaces. Energy efficiency refers to the ability of a furnace to convert fuel into heat with minimal waste. This is typically measured by the Annual Fuel Utilization Efficiency (AFUE) rating, which indicates what percentage of fuel is actually used for heating as opposed to being lost in the process. High-efficiency furnaces generally boast an AFUE rating above 90%, meaning they convert more than 90% of their fuel into usable heat.

Among the leading brands in mobile home furnace installations, Goodman stands out for its commitment to high energy efficiency. Goodman's models often feature advanced technologies like variable-speed blowers that adjust airflow based on real-time heating demands, minimizing energy wastage while ensuring consistent comfort levels.

In contrast, Lennox offers a range of furnaces known for their robust performance and quiet operation. While maintaining competitive energy efficiency ratings, Lennox emphasizes innovation in design with features such as dual-fuel compatibility and smart thermostats that enhance user convenience and control over heating settings.

Another major player is Trane, celebrated for its durable construction and reliable performance even in extreme conditions. Trane's focus on durability does not come at the expense of efficiency; many models include modulating burners and insulated cabinets designed to maximize heat retention and reduce operational noise.

Moreover, Carrier furnaces have garnered attention for integrating cutting-edge technology with eco-friendly initiatives. Carrier's Greenspeed Intelligence adapts heating output to match precise temperature requirements, optimizing both comfort and energy savings.

While each brand offers unique strengths tailored to different priorities-whether it be cost savings through high efficiency or superior performance under challenging conditions-the decision largely depends on individual needs and circumstances. For instance, homes located in colder climates may prioritize performance over initial cost by investing in a highly durable option like Trane or Lennox. Conversely, homeowners focused on reducing their carbon footprint might lean towards Carrier's environmentally conscious offerings.

Ultimately, choosing between these top brands requires weighing personal preferences against technical specifications such as AFUE ratings, warranty terms, installation costs, and additional features offered by each manufacturer. Consulting with HVAC professionals can further illuminate which system best aligns with specific household requirements while ensuring compliance with local regulations regarding mobile home installations.

In conclusion, exploring major brands for mobile home furnace installations involves a careful balance of evaluating energy efficiency alongside overall performance attributes. By considering both immediate needs and future implications on utility expenditures and environmental impact, homeowners can make informed choices that enhance comfort without compromising sustainability or financial prudence.





Explanation of common financing packages available

When considering the installation of a mobile home furnace, one must navigate a landscape filled with various brands and models that promise optimal warmth and efficiency. However, beyond the allure of sleek designs and advanced technology, lies the critical aspect of installation considerations and compatibility with existing systems-a factor that often

determines both the short-term functionality and long-term satisfaction derived from the furnace.

Mobile homes, by their very nature, present unique challenges when it comes to heating solutions. Unlike traditional houses, these structures have specific requirements in terms of space and ventilation. Therefore, selecting a furnace involves more than just picking a brand; it requires an understanding of how the unit will integrate with the existing setup. Each major brand offers distinct features tailored to meet different needs-some prioritize energy efficiency, while others focus on compactness or ease of use. Yet, no matter how advanced or reputable a brand is, its furnace must harmoniously align with the mobile home's construction nuances.

Compatibility is another cornerstone in this decision-making process. Many mobile homes come equipped with pre-existing ductwork or HVAC systems that are designed to function within certain parameters. A new furnace must seamlessly connect with these components to ensure optimal performance without necessitating extensive modifications. For instance, if an existing system relies on specific types of vents or power sources, any new installation must accommodate these elements to prevent inefficiencies or safety hazards.

Moreover, major brands often offer furnaces that are compatible with smart home technologies or eco-friendly initiatives-an attractive feature for modern consumers. However, integrating these sophisticated systems into older mobile homes can pose challenges unless there's clear compatibility between new technologies and old infrastructures.

In addition to technical aspects, practical considerations such as warranty coverage and service support are vital when choosing a furnace brand for mobile home installations. Established brands typically provide comprehensive warranties and robust customer service networks which can be invaluable should issues arise post-installation.

In conclusion, while exploring major brands for mobile home furnace installations can be an exciting venture filled with possibilities for improved comfort and efficiency, it demands careful attention to installation considerations and compatibility issues. Understanding how different units fit into existing systems ensures not only effective heating but also enhances overall safety and longevity of the investment. Thus, informed choices rooted in compatibility will likely yield warmth that extends beyond physical comfort-a testament to foresight in blending tradition with innovation within one's living space.

Key factors to consider when choosing a financing option

When considering furnace installations for mobile homes, understanding the intricacies of cost analysis and budgeting is essential. These dwellings, often characterized by their unique spatial and structural requirements, demand specialized heating solutions that are both efficient and cost-effective. A key aspect of this process involves exploring major brands that cater to these specific needs.

Mobile home furnaces differ from traditional home heating systems in several ways, primarily due to their size, installation requirements, and energy efficiency standards. Major brands have recognized these distinctions and offer a variety of products tailored for mobile homes. By examining these brands, homeowners can make informed decisions that balance initial costs with long-term savings.

One notable brand in the market is Coleman. Known for its reliability and durability, Coleman offers a range of furnaces specifically designed for mobile homes. These units are praised for their compact size and energy efficiency, making them an attractive option for budget-conscious consumers who do not want to compromise on quality or performance.

Another significant player is Nordyne, which markets its products under various names such as Intertherm and Miller. Nordyne furnaces are known for their adaptability to different fuel types-whether it's natural gas or propane-which provides flexibility depending on regional availability and pricing. This versatility can lead to substantial savings over time as homeowners can choose the most economical heating option available in their area.

Carrier also merits mention among top brands catering to mobile home heating needs. With a focus on advanced technology and environmental sustainability, Carrier's offerings include high-efficiency models that promise reduced energy consumption without sacrificing warmth or

comfort during colder months. While the upfront costs might be higher than other brands, the potential energy savings could offset this initial investment over time.

Beyond brand selection, conducting a comprehensive cost analysis is imperative when budgeting for furnace installations in mobile homes. This involves evaluating not only the price of the unit itself but also installation costs, ongoing maintenance expenses, warranty terms, and potential energy savings over the furnace's lifespan. Homeowners should seek quotes from multiple vendors to ensure they are receiving competitive prices and service agreements.

In conclusion, exploring major brands like Coleman, Nordyne, and Carrier reveals a spectrum of options available for mobile home furnace installations—a crucial step in effective cost analysis and budgeting. By carefully weighing factors such as initial purchase price against long-term operational costs and efficiency benefits, homeowners can make strategic decisions that safeguard both comfort and financial health throughout the chilly seasons ahead.



Personal Loans for HVAC Systems

In the realm of mobile home furnace installations, customer reviews and satisfaction ratings serve as pivotal indicators of a brand's reliability and quality. As homeowners seek comfort during colder months, the efficiency and durability of a furnace become paramount, making consumer feedback an invaluable resource for prospective buyers navigating this niche market.

Major brands in the mobile home furnace industry such as Coleman, Miller, and Nordyne have established themselves through years of innovation and service. However, their reputation is continually shaped by direct customer experiences. These experiences are often shared in online platforms where potential buyers can discern which brands consistently meet or exceed expectations.

Coleman, for instance, is frequently praised for its robust performance and energy efficiency. Many customers highlight the brand's longevity and low maintenance requirements in their reviews. Satisfaction ratings often reflect Coleman's commitment to delivering reliable products that withstand harsh conditions while maintaining optimal indoor temperatures.

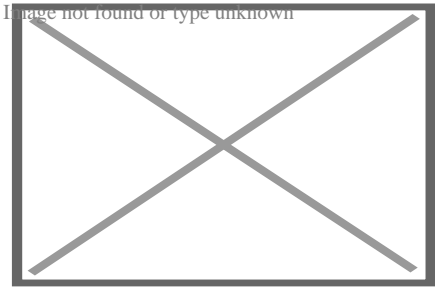
Miller furnaces also garner positive attention from consumers who value straightforward installation processes and comprehensive warranties. Customer reviews often emphasize the brand's dedication to providing well-engineered systems that offer peace of mind through superior safety features. This aspect is crucial for mobile homes where space constraints demand equipment that maximizes utility without compromising safety.

Nordyne stands out for its innovative approach to energy consumption, appealing to environmentally conscious consumers seeking sustainable heating solutions. Users frequently commend Nordyne's adaptive technology that adjusts heating output based on usage patterns, thereby enhancing energy savings without sacrificing comfort. Satisfaction ratings here tend to showcase the brand's ability to blend modern technological advancements with user-friendly interfaces.

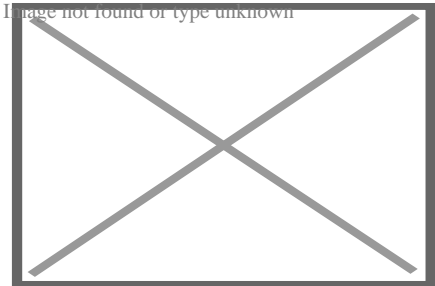
However, it is not uncommon for customer reviews to address areas needing improvement across these brands. Common themes include issues with component durability under extreme weather conditions or challenges faced during warranty claims processing. Such feedback is essential as it not only guides manufacturers in refining their products but also assists other consumers in making informed decisions based on real-world insights.

In conclusion, customer reviews and satisfaction ratings play an indispensable role in evaluating major brands offering mobile home furnace installations. They provide a window into actual product performance beyond marketing claims while highlighting both strengths and areas requiring development. For potential buyers navigating this critical purchase decision, these insights can lead them to choose a furnace system that aligns closely with their specific needs-ensuring warmth and comfort throughout the winter months.

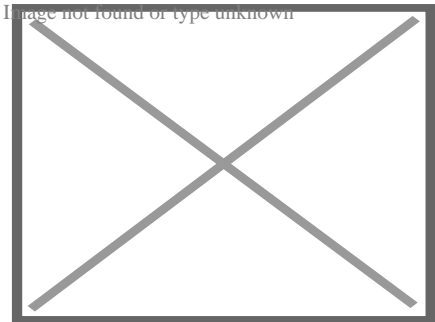
About Heating, ventilation, and air conditioning



Rooftop HVAC unit with view of fresh-air intake vent



Ventilation duct with outlet diffuser vent. These are installed throughout a building to move air in or out of rooms. In the middle is a damper to open and close the vent to allow more or less air to enter the space.



The control circuit in a household HVAC installation. The wires connecting to the blue terminal block on the upper-right of the board lead to the thermostat. The fan enclosure is directly behind the board, and the filters can be seen at the top. The safety interlock switch is at the bottom left. In the lower middle is the capacitor.

Heating, ventilation, and air conditioning (HVAC) is the use of various technologies to control the temperature, humidity, and purity of the air in an enclosed space. Its goal is to provide thermal comfort and acceptable indoor air quality. HVAC system design is a subdiscipline of mechanical engineering, based on the principles of thermodynamics, fluid mechanics, and heat transfer. "Refrigeration" is sometimes added to the field's abbreviation as **HVAC&R** or **HVACR**, or "ventilation" is dropped, as in **HACR** (as in the designation of HACR-rated circuit breakers).

HVAC is an important part of residential structures such as single family homes, apartment buildings, hotels, and senior living facilities; medium to large industrial and office buildings such as skyscrapers and hospitals; vehicles such as cars, trains, airplanes, ships and submarines; and in marine environments, where safe and healthy building conditions are regulated with respect to temperature and humidity, using fresh air from outdoors.

Ventilating or ventilation (the "V" in HVAC) is the process of exchanging or replacing air in any space to provide high indoor air quality which involves temperature control, oxygen replenishment, and removal of moisture, odors, smoke, heat, dust, airborne bacteria, carbon dioxide, and other gases. Ventilation removes unpleasant smells and excessive moisture, introduces outside air, keeps interior building air circulating, and prevents stagnation of the interior air. Methods for ventilating a building are divided into *mechanical/forced* and *natural* types.^[1]

Overview

[edit]

The three major functions of heating, ventilation, and air conditioning are interrelated, especially with the need to provide thermal comfort and acceptable indoor air quality within reasonable installation, operation, and maintenance costs. HVAC systems can be used in both domestic and commercial environments. HVAC systems can provide ventilation, and maintain pressure relationships between spaces. The means of air delivery and removal from spaces is known as room air distribution.^[2]

Individual systems

[edit]

See also: HVAC control system

In modern buildings, the design, installation, and control systems of these functions are integrated into one or more HVAC systems. For very small buildings, contractors

normally estimate the capacity and type of system needed and then design the system, selecting the appropriate refrigerant and various components needed. For larger buildings, building service designers, mechanical engineers, or building services engineers analyze, design, and specify the HVAC systems. Specialty mechanical contractors and suppliers then fabricate, install and commission the systems. Building permits and code-compliance inspections of the installations are normally required for all sizes of buildings

District networks

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Although HVAC is executed in individual buildings or other enclosed spaces (like NORAD's underground headquarters), the equipment involved is in some cases an extension of a larger district heating (DH) or district cooling (DC) network, or a combined DHC network. In such cases, the operating and maintenance aspects are simplified and metering becomes necessary to bill for the energy that is consumed, and in some cases energy that is returned to the larger system. For example, at a given time one building may be utilizing chilled water for air conditioning and the warm water it returns may be used in another building for heating, or for the overall heating-portion of the DHC network (likely with energy added to boost the temperature).[³][⁴][⁵]

Basing HVAC on a larger network helps provide an economy of scale that is often not possible for individual buildings, for utilizing renewable energy sources such as solar heat,[⁶][⁷][⁸] winter's cold,[⁹][¹⁰] the cooling potential in some places of lakes or seawater for free cooling, and the enabling function of seasonal thermal energy storage. By utilizing natural sources that can be used for HVAC systems it can make a huge difference for the environment and help expand the knowledge of using different methods.

History

[edit]

See also: Air conditioning § History

HVAC is based on inventions and discoveries made by Nikolay Lvov, Michael Faraday, Rolla C. Carpenter, Willis Carrier, Edwin Ruud, Reuben Trane, James Joule, William Rankine, Sadi Carnot, Alice Parker and many others.[¹¹]

Multiple inventions within this time frame preceded the beginnings of the first comfort air conditioning system, which was designed in 1902 by Alfred Wolff (Cooper, 2003) for the

New York Stock Exchange, while Willis Carrier equipped the Sacketts-Wilhems Printing Company with the process AC unit the same year. Coyne College was the first school to offer HVAC training in 1899.^[12] The first residential AC was installed by 1914, and by the 1950s there was "widespread adoption of residential AC".^[13]

The invention of the components of HVAC systems went hand-in-hand with the Industrial Revolution, and new methods of modernization, higher efficiency, and system control are constantly being introduced by companies and inventors worldwide.

Heating

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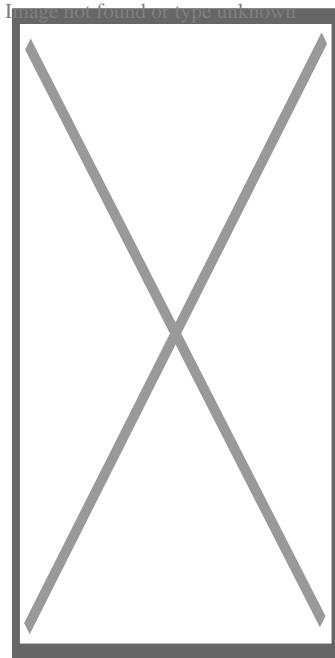
"Heater" redirects here. For other uses, see Heater (disambiguation).

Main article: Central heating

Heaters are appliances whose purpose is to generate heat (i.e. warmth) for the building. This can be done via central heating. Such a system contains a boiler, furnace, or heat pump to heat water, steam, or air in a central location such as a furnace room in a home, or a mechanical room in a large building. The heat can be transferred by convection, conduction, or radiation. Space heaters are used to heat single rooms and only consist of a single unit.

Generation

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Central heating unit

Heaters exist for various types of fuel, including solid fuels, liquids, and gases. Another type of heat source is electricity, normally heating ribbons composed of high resistance wire (see Nichrome). This principle is also used for baseboard heaters and portable heaters. Electrical heaters are often used as backup or supplemental heat for heat pump systems.

The heat pump gained popularity in the 1950s in Japan and the United States^[14] Heat pumps can extract heat from various sources, such as environmental air, exhaust air from a building, or from the ground. Heat pumps transfer heat from outside the structure into the air inside. Initially, heat pump HVAC systems were only used in moderate climates, but with improvements in low temperature operation and reduced loads due to more efficient homes, they are increasing in popularity in cooler climates. They can also operate in reverse to cool an interior.

Distribution

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Water/steam

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In the case of heated water or steam, piping is used to transport the heat to the rooms. Most modern hot water boiler heating systems have a circulator, which is a pump, to move hot water through the distribution system (as opposed to older gravity-fed systems). The heat can be transferred to the surrounding air using radiators, hot water coils (hydro-air), or other heat exchangers. The radiators may be mounted on walls or installed within the floor to produce floor heat.

The use of water as the heat transfer medium is known as hydronics. The heated water can also supply an auxiliary heat exchanger to supply hot water for bathing and washing.

Air

[edit]

Main articles: Room air distribution and Underfloor air distribution

Warm air systems distribute the heated air through ductwork systems of supply and return air through metal or fiberglass ducts. Many systems use the same ducts to distribute air cooled by an evaporator coil for air conditioning. The air supply is normally filtered through air filters^[*dubious – discuss*] to remove dust and pollen particles.^[15]

Dangers

[edit]

The use of furnaces, space heaters, and boilers as a method of indoor heating could result in incomplete combustion and the emission of carbon monoxide, nitrogen oxides, formaldehyde, volatile organic compounds, and other combustion byproducts. Incomplete combustion occurs when there is insufficient oxygen; the inputs are fuels containing various contaminants and the outputs are harmful byproducts, most dangerously carbon monoxide, which is a tasteless and odorless gas with serious adverse health effects.^[16]

Without proper ventilation, carbon monoxide can be lethal at concentrations of 1000 ppm (0.1%). However, at several hundred ppm, carbon monoxide exposure induces headaches, fatigue, nausea, and vomiting. Carbon monoxide binds with hemoglobin in the blood, forming carboxyhemoglobin, reducing the blood's ability to transport oxygen. The primary health concerns associated with carbon monoxide exposure are its cardiovascular and neurobehavioral effects. Carbon monoxide can cause atherosclerosis (the hardening of arteries) and can also trigger heart attacks. Neurologically, carbon monoxide exposure reduces hand to eye coordination, vigilance, and continuous performance. It can also affect time discrimination.^[17]

Ventilation

[edit]

Main article: Ventilation (architecture)

See also: Duct (flow)

Ventilation is the process of changing or replacing air in any space to control the temperature or remove any combination of moisture, odors, smoke, heat, dust, airborne bacteria, or carbon dioxide, and to replenish oxygen. It plays a critical role in maintaining a healthy indoor environment by preventing the buildup of harmful pollutants and ensuring the circulation of fresh air. Different methods, such as natural ventilation through windows and mechanical ventilation systems, can be used depending on the building design and air quality needs. Ventilation often refers to the intentional delivery of the outside air to the building indoor space. It is one of the most important factors for maintaining acceptable indoor air quality in buildings.

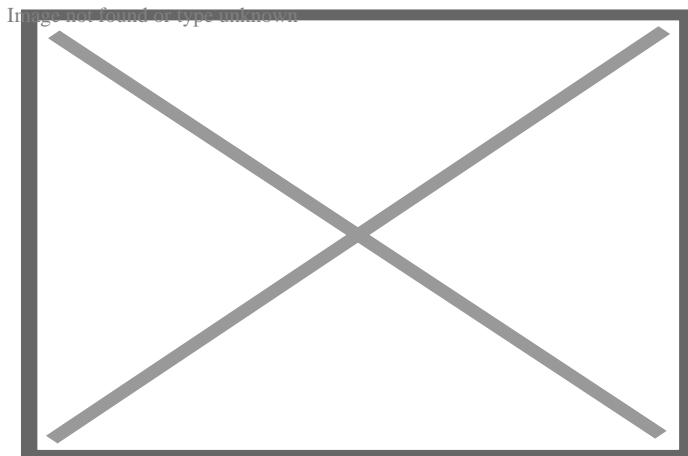
Although ventilation is an integral component of maintaining good indoor air quality, it may not be satisfactory alone.^[18] A clear understanding of both indoor and outdoor air quality parameters is needed to improve the performance of ventilation in terms of ..^[19] In scenarios where outdoor pollution would deteriorate indoor air quality, other treatment devices such as filtration may also be necessary.^[20]

Methods for ventilating a building may be divided into *mechanical/forced* and *natural* types.^[21]

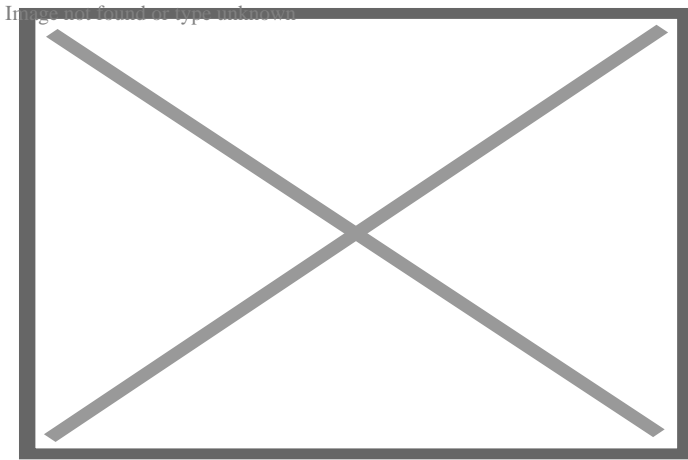
Mechanical or forced

[edit]

Further information: Ventilation (architecture) § Mechanical systems



HVAC ventilation exhaust for a 12-story building



An axial belt-drive exhaust fan serving an underground car park. This exhaust fan's operation is interlocked with the concentration of contaminants emitted by internal combustion engines.

Mechanical, or forced, ventilation is provided by an air handler (AHU) and used to control indoor air quality. Excess humidity, odors, and contaminants can often be controlled via dilution or replacement with outside air. However, in humid climates more energy is required to remove excess moisture from ventilation air.

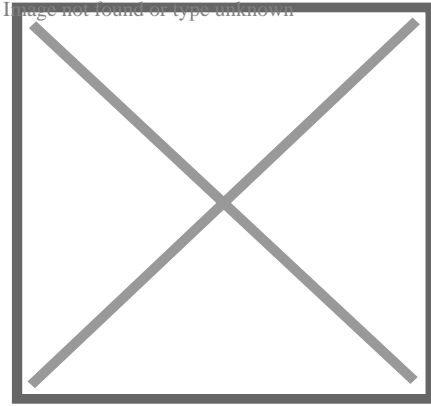
Kitchens and bathrooms typically have mechanical exhausts to control odors and sometimes humidity. Factors in the design of such systems include the flow rate (which is a function of the fan speed and exhaust vent size) and noise level. Direct drive fans are available for many applications and can reduce maintenance needs.

In summer, ceiling fans and table/floor fans circulate air within a room for the purpose of reducing the perceived temperature by increasing evaporation of perspiration on the skin of the occupants. Because hot air rises, ceiling fans may be used to keep a room warmer in the winter by circulating the warm stratified air from the ceiling to the floor.

Passive

[edit]

Main article: [Passive ventilation](#)



Ventilation on the downdraught system, by impulsion, or the 'plenum' principle, applied to schoolrooms (1899)

Natural ventilation is the ventilation of a building with outside air without using fans or other mechanical systems. It can be via operable windows, louvers, or trickle vents when spaces are small and the architecture permits. ASHRAE defined Natural ventilation as the flow of air through open windows, doors, grilles, and other planned building envelope penetrations, and as being driven by natural and/or artificially produced pressure differentials.^[1]

Natural ventilation strategies also include cross ventilation, which relies on wind pressure differences on opposite sides of a building. By strategically placing openings, such as windows or vents, on opposing walls, air is channeled through the space to enhance cooling and ventilation. Cross ventilation is most effective when there are clear, unobstructed paths for airflow within the building.

In more complex schemes, warm air is allowed to rise and flow out high building openings to the outside (stack effect), causing cool outside air to be drawn into low building openings. Natural ventilation schemes can use very little energy, but care must be taken to ensure comfort. In warm or humid climates, maintaining thermal comfort solely via natural ventilation might not be possible. Air conditioning systems are used, either as backups or supplements. Air-side economizers also use outside air to condition spaces, but do so using fans, ducts, dampers, and control systems to introduce and distribute cool outdoor air when appropriate.

An important component of natural ventilation is air change rate or air changes per hour: the hourly rate of ventilation divided by the volume of the space. For example, six air changes per hour means an amount of new air, equal to the volume of the space, is added every ten minutes. For human comfort, a minimum of four air changes per hour is typical, though warehouses might have only two. Too high of an air change rate may be uncomfortable, akin to a wind tunnel which has thousands of changes per hour. The highest air change rates are for crowded spaces, bars, night clubs, commercial kitchens at around 30 to 50 air changes per hour.^[22]

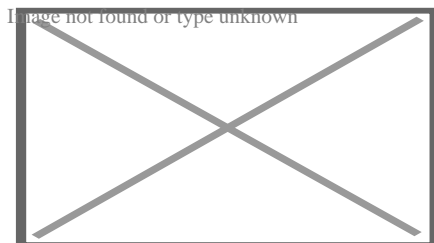
Room pressure can be either positive or negative with respect to outside the room. Positive pressure occurs when there is more air being supplied than exhausted, and is common to reduce the infiltration of outside contaminants.[²³]

Airborne diseases

[edit]

Natural ventilation [²⁴] is a key factor in reducing the spread of airborne illnesses such as tuberculosis, the common cold, influenza, meningitis or COVID-19. Opening doors and windows are good ways to maximize natural ventilation, which would make the risk of airborne contagion much lower than with costly and maintenance-requiring mechanical systems. Old-fashioned clinical areas with high ceilings and large windows provide the greatest protection. Natural ventilation costs little and is maintenance free, and is particularly suited to limited-resource settings and tropical climates, where the burden of TB and institutional TB transmission is highest. In settings where respiratory isolation is difficult and climate permits, windows and doors should be opened to reduce the risk of airborne contagion. Natural ventilation requires little maintenance and is inexpensive.[²⁵]

Natural ventilation is not practical in much of the infrastructure because of climate. This means that the facilities need to have effective mechanical ventilation systems and or use Ceiling Level UV or FAR UV ventilation systems.



Alpha Black Edition - Sirair Air conditioner with UVC (Ultraviolet Germicidal Irradiation)

Ventilation is measured in terms of Air Changes Per Hour (ACH). As of 2023, the CDC recommends that all spaces have a minimum of 5 ACH.[²⁶] For hospital rooms with airborne contagions the CDC recommends a minimum of 12 ACH.[²⁷] The challenges in facility ventilation are public unawareness,[²⁸][²⁹] ineffective government oversight, poor building codes that are based on comfort levels, poor system operations, poor maintenance, and lack of transparency.[³⁰]

UVC or Ultraviolet Germicidal Irradiation is a function used in modern air conditioners which reduces airborne viruses, bacteria, and fungi, through the use of a built-in LED UV

light that emits a gentle glow across the evaporator. As the cross-flow fan circulates the room air, any viruses are guided through the sterilization module's irradiation range, rendering them instantly inactive.^[31]

Air conditioning

[edit]

Main article: Air conditioning

An air conditioning system, or a standalone air conditioner, provides cooling and/or humidity control for all or part of a building. Air conditioned buildings often have sealed windows, because open windows would work against the system intended to maintain constant indoor air conditions. Outside, fresh air is generally drawn into the system by a vent into a mix air chamber for mixing with the space return air. Then the mixture air enters an indoor or outdoor heat exchanger section where the air is to be cooled down, then be guided to the space creating positive air pressure. The percentage of return air made up of fresh air can usually be manipulated by adjusting the opening of this vent. Typical fresh air intake is about 10% of the total supply air.^[citation needed]

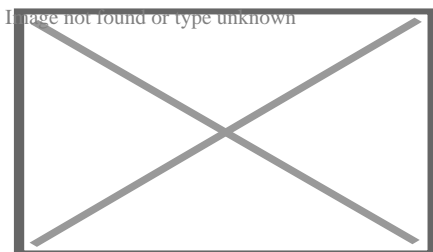
Air conditioning and refrigeration are provided through the removal of heat. Heat can be removed through radiation, convection, or conduction. The heat transfer medium is a refrigeration system, such as water, air, ice, and chemicals are referred to as refrigerants. A refrigerant is employed either in a heat pump system in which a compressor is used to drive thermodynamic refrigeration cycle, or in a free cooling system that uses pumps to circulate a cool refrigerant (typically water or a glycol mix).

It is imperative that the air conditioning horsepower is sufficient for the area being cooled. Underpowered air conditioning systems will lead to power wastage and inefficient usage. Adequate horsepower is required for any air conditioner installed.

Refrigeration cycle

[edit]

Main article: Heat pump and refrigeration cycle



A simple stylized diagram of the refrigeration cycle: 1) condensing coil, 2) expansion valve, 3) evaporating coil, 4) compressor

The refrigeration cycle uses four essential elements to cool, which are compressor, condenser, metering device, and evaporator.

- At the inlet of a compressor, the refrigerant inside the system is in a low pressure, low temperature, gaseous state. The **compressor** pumps the refrigerant gas up to high pressure and temperature.
- From there it enters a heat exchanger (sometimes called a **condensing coil** or condenser) where it loses heat to the outside, cools, and condenses into its liquid phase.
- An **expansion valve** (also called metering device) regulates the refrigerant liquid to flow at the proper rate.
- The liquid refrigerant is returned to another heat exchanger where it is allowed to evaporate, hence the heat exchanger is often called an **evaporating coil** or evaporator. As the liquid refrigerant evaporates it absorbs heat from the inside air, returns to the compressor, and repeats the cycle. In the process, heat is absorbed from indoors and transferred outdoors, resulting in cooling of the building.

In variable climates, the system may include a reversing valve that switches from heating in winter to cooling in summer. By reversing the flow of refrigerant, the heat pump refrigeration cycle is changed from cooling to heating or vice versa. This allows a facility to be heated and cooled by a single piece of equipment by the same means, and with the same hardware.

Free cooling

[edit]

Main article: Free cooling

Free cooling systems can have very high efficiencies, and are sometimes combined with seasonal thermal energy storage so that the cold of winter can be used for summer air conditioning. Common storage mediums are deep aquifers or a natural underground rock mass accessed via a cluster of small-diameter, heat-exchanger-equipped boreholes. Some systems with small storages are hybrids, using free cooling early in the cooling season, and later employing a heat pump to chill the circulation coming from the storage. The heat pump is added-in because the storage acts as a heat sink when the system is in cooling (as opposed to charging) mode, causing the temperature to gradually increase during the cooling season.

Some systems include an "economizer mode", which is sometimes called a "free-cooling mode". When economizing, the control system will open (fully or partially) the outside air damper and close (fully or partially) the return air damper. This will cause fresh, outside air to be supplied to the system. When the outside air is cooler than the demanded cool air, this will allow the demand to be met without using the mechanical supply of cooling (typically chilled water or a direct expansion "DX" unit), thus saving energy. The control system can compare the temperature of the outside air vs. return air, or it can compare the enthalpy of the air, as is frequently done in climates where humidity is more of an issue. In both cases, the outside air must be less energetic than the return air for the system to enter the economizer mode.

Packaged split system

[edit]

Central, "all-air" air-conditioning systems (or package systems) with a combined outdoor condenser/evaporator unit are often installed in North American residences, offices, and public buildings, but are difficult to retrofit (install in a building that was not designed to receive it) because of the bulky air ducts required.^[32] (Minisplit ductless systems are used in these situations.) Outside of North America, packaged systems are only used in limited applications involving large indoor space such as stadiums, theatres or exhibition halls.

An alternative to packaged systems is the use of separate indoor and outdoor coils in split systems. Split systems are preferred and widely used worldwide except in North America. In North America, split systems are most often seen in residential applications, but they are gaining popularity in small commercial buildings. Split systems are used where ductwork is not feasible or where the space conditioning efficiency is of prime concern.^[33] The benefits of ductless air conditioning systems include easy installation, no ductwork, greater zonal control, flexibility of control, and quiet operation.^[34] In space conditioning, the duct losses can account for 30% of energy consumption.^[35] The use of minisplits can result in energy savings in space conditioning as there are no losses associated with ducting.

With the split system, the evaporator coil is connected to a remote condenser unit using refrigerant piping between an indoor and outdoor unit instead of ducting air directly from the outdoor unit. Indoor units with directional vents mount onto walls, suspended from ceilings, or fit into the ceiling. Other indoor units mount inside the ceiling cavity so that short lengths of duct handle air from the indoor unit to vents or diffusers around the rooms.

Split systems are more efficient and the footprint is typically smaller than the package systems. On the other hand, package systems tend to have a slightly lower indoor noise level compared to split systems since the fan motor is located outside.

Dehumidification

[edit]

Dehumidification (air drying) in an air conditioning system is provided by the evaporator. Since the evaporator operates at a temperature below the dew point, moisture in the air condenses on the evaporator coil tubes. This moisture is collected at the bottom of the evaporator in a pan and removed by piping to a central drain or onto the ground outside.

A dehumidifier is an air-conditioner-like device that controls the humidity of a room or building. It is often employed in basements that have a higher relative humidity because of their lower temperature (and propensity for damp floors and walls). In food retailing establishments, large open chiller cabinets are highly effective at dehumidifying the internal air. Conversely, a humidifier increases the humidity of a building.

The HVAC components that dehumidify the ventilation air deserve careful attention because outdoor air constitutes most of the annual humidity load for nearly all buildings.[³⁶]

Humidification

[edit]

Main article: Humidifier

Maintenance

[edit]

All modern air conditioning systems, even small window package units, are equipped with internal air filters.^[*citation needed*] These are generally of a lightweight gauze-like material, and must be replaced or washed as conditions warrant. For example, a building in a high dust environment, or a home with furry pets, will need to have the filters changed more often than buildings without these dirt loads. Failure to replace these

filters as needed will contribute to a lower heat exchange rate, resulting in wasted energy, shortened equipment life, and higher energy bills; low air flow can result in iced-over evaporator coils, which can completely stop airflow. Additionally, very dirty or plugged filters can cause overheating during a heating cycle, which can result in damage to the system or even fire.

Because an air conditioner moves heat between the indoor coil and the outdoor coil, both must be kept clean. This means that, in addition to replacing the air filter at the evaporator coil, it is also necessary to regularly clean the condenser coil. Failure to keep the condenser clean will eventually result in harm to the compressor because the condenser coil is responsible for discharging both the indoor heat (as picked up by the evaporator) and the heat generated by the electric motor driving the compressor.

Energy efficiency

[edit]

HVAC is significantly responsible for promoting energy efficiency of buildings as the building sector consumes the largest percentage of global energy.^[37] Since the 1980s, manufacturers of HVAC equipment have been making an effort to make the systems they manufacture more efficient. This was originally driven by rising energy costs, and has more recently been driven by increased awareness of environmental issues. Additionally, improvements to the HVAC system efficiency can also help increase occupant health and productivity.^[38] In the US, the EPA has imposed tighter restrictions over the years. There are several methods for making HVAC systems more efficient.

Heating energy

[edit]

In the past, water heating was more efficient for heating buildings and was the standard in the United States. Today, forced air systems can double for air conditioning and are more popular.

Some benefits of forced air systems, which are now widely used in churches, schools, and high-end residences, are

- Better air conditioning effects
- Energy savings of up to 15–20%
- Even conditioning^[citation needed]

A drawback is the installation cost, which can be slightly higher than traditional HVAC systems.

Energy efficiency can be improved even more in central heating systems by introducing zoned heating. This allows a more granular application of heat, similar to non-central heating systems. Zones are controlled by multiple thermostats. In water heating systems the thermostats control zone valves, and in forced air systems they control zone dampers inside the vents which selectively block the flow of air. In this case, the control system is very critical to maintaining a proper temperature.

Forecasting is another method of controlling building heating by calculating the demand for heating energy that should be supplied to the building in each time unit.

Ground source heat pump

[edit]

Main article: Geothermal heat pump

Ground source, or geothermal, heat pumps are similar to ordinary heat pumps, but instead of transferring heat to or from outside air, they rely on the stable, even temperature of the earth to provide heating and air conditioning. Many regions experience seasonal temperature extremes, which would require large-capacity heating and cooling equipment to heat or cool buildings. For example, a conventional heat pump system used to heat a building in Montana's -57 °C (-70 °F) low temperature or cool a building in the highest temperature ever recorded in the US— 57 °C (134 °F) in Death Valley, California, in 1913 would require a large amount of energy due to the extreme difference between inside and outside air temperatures. A metre below the earth's surface, however, the ground remains at a relatively constant temperature. Utilizing this large source of relatively moderate temperature earth, a heating or cooling system's capacity can often be significantly reduced. Although ground temperatures vary according to latitude, at 1.8 metres (6 ft) underground, temperatures generally only range from $7\text{ to }24\text{ °C}$ ($45\text{ to }75\text{ °F}$).

Solar air conditioning

[edit]

Main article: Solar air conditioning

Photovoltaic solar panels offer a new way to potentially decrease the operating cost of air conditioning. Traditional air conditioners run using alternating current, and hence, any direct-current solar power needs to be inverted to be compatible with these units. New variable-speed DC-motor units allow solar power to more easily run them since this conversion is unnecessary, and since the motors are tolerant of voltage fluctuations associated with variance in supplied solar power (e.g., due to cloud cover).

Ventilation energy recovery

[edit]

Energy recovery systems sometimes utilize heat recovery ventilation or energy recovery ventilation systems that employ heat exchangers or enthalpy wheels to recover sensible or latent heat from exhausted air. This is done by transfer of energy from the stale air inside the home to the incoming fresh air from outside.

Air conditioning energy

[edit]

The performance of vapor compression refrigeration cycles is limited by thermodynamics.^[39] These air conditioning and heat pump devices *move* heat rather than convert it from one form to another, so *thermal efficiencies* do not appropriately describe the performance of these devices. The Coefficient of performance (COP) measures performance, but this dimensionless measure has not been adopted. Instead, the Energy Efficiency Ratio (*EER*) has traditionally been used to characterize the performance of many HVAC systems. EER is the Energy Efficiency Ratio based on a 35 °C (95 °F) outdoor temperature. To more accurately describe the performance of air conditioning equipment over a typical cooling season a modified version of the EER, the Seasonal Energy Efficiency Ratio (*SEER*), or in Europe the ESEER, is used. SEER ratings are based on seasonal temperature averages instead of a constant 35 °C (95 °F) outdoor temperature. The current industry minimum SEER rating is 14 SEER. Engineers have pointed out some areas where efficiency of the existing hardware could be improved. For example, the fan blades used to move the air are usually stamped from sheet metal, an economical method of manufacture, but as a result they are not aerodynamically efficient. A well-designed blade could reduce the electrical power required to move the air by a third.^[40]

Demand-controlled kitchen ventilation

[edit]

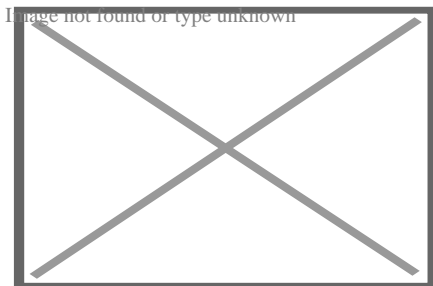
Main article: Demand controlled ventilation

Demand-controlled kitchen ventilation (DCKV) is a building controls approach to controlling the volume of kitchen exhaust and supply air in response to the actual cooking loads in a commercial kitchen. Traditional commercial kitchen ventilation systems operate at 100% fan speed independent of the volume of cooking activity and DCKV technology changes that to provide significant fan energy and conditioned air savings. By deploying smart sensing technology, both the exhaust and supply fans can be controlled to capitalize on the affinity laws for motor energy savings, reduce makeup air heating and cooling energy, increasing safety, and reducing ambient kitchen noise levels.^[41]

Air filtration and cleaning

[edit]

Main article: Air filter



Air handling unit, used for heating, cooling, and filtering the air

Air cleaning and filtration removes particles, contaminants, vapors and gases from the air. The filtered and cleaned air then is used in heating, ventilation, and air conditioning. Air cleaning and filtration should be taken in account when protecting our building environments.^[42] If present, contaminants can come out from the HVAC systems if not removed or filtered properly.

Clean air delivery rate (CADR) is the amount of clean air an air cleaner provides to a room or space. When determining CADR, the amount of airflow in a space is taken into account. For example, an air cleaner with a flow rate of 30 cubic metres (1,000 cu ft) per minute and an efficiency of 50% has a CADR of 15 cubic metres (500 cu ft) per minute. Along with CADR, filtration performance is very important when it comes to the air in our indoor environment. This depends on the size of the particle or fiber, the filter packing

density and depth, and the airflow rate.^[42]

Circulation of harmful substances

[edit]

 This section **needs expansion**. You can help by adding to it. (*October 2024*)

Poorly maintained air conditioners/ventilation systems can harbor mold, bacteria, and other contaminants, which are then circulated throughout indoor spaces, contributing to ...^[43]

Industry and standards

[edit]

The HVAC industry is a worldwide enterprise, with roles including operation and maintenance, system design and construction, equipment manufacturing and sales, and in education and research. The HVAC industry was historically regulated by the manufacturers of HVAC equipment, but regulating and standards organizations such as HARDI (Heating, Air-conditioning and Refrigeration Distributors International), ASHRAE, SMACNA, ACCA (Air Conditioning Contractors of America), Uniform Mechanical Code, International Mechanical Code, and AMCA have been established to support the industry and encourage high standards and achievement. (UL as an omnibus agency is not specific to the HVAC industry.)

The starting point in carrying out an estimate both for cooling and heating depends on the exterior climate and interior specified conditions. However, before taking up the heat load calculation, it is necessary to find fresh air requirements for each area in detail, as pressurization is an important consideration.

International

[edit]

ISO 16813:2006 is one of the ISO building environment standards.^[44] It establishes the general principles of building environment design. It takes into account the need to provide a healthy indoor environment for the occupants as well as the need to protect the environment for future generations and promote collaboration among the various parties involved in building environmental design for sustainability. ISO16813 is applicable to new construction and the retrofit of existing buildings.^[45]

The building environmental design standard aims to:[⁴⁵]

- provide the constraints concerning sustainability issues from the initial stage of the design process, with building and plant life cycle to be considered together with owning and operating costs from the beginning of the design process;
- assess the proposed design with rational criteria for indoor air quality, thermal comfort, acoustical comfort, visual comfort, energy efficiency, and HVAC system controls at every stage of the design process;
- iterate decisions and evaluations of the design throughout the design process.

United States

[edit]

Licensing

[edit]

Main article: Section 608 EPA Certification

In the United States, federal licensure is generally handled by EPA certified (for installation and service of HVAC devices).

Many U.S. states have licensing for boiler operation. Some of these are listed as follows:

- Arkansas [⁴⁶]
- Georgia [⁴⁷]
- Michigan [⁴⁸]
- Minnesota [⁴⁹]
- Montana [⁵⁰]
- New Jersey [⁵¹]
- North Dakota [⁵²]
- Ohio [⁵³]
- Oklahoma [⁵⁴]
- Oregon [⁵⁵]

Finally, some U.S. cities may have additional labor laws that apply to HVAC professionals.

Societies

[edit]

See also: American Society of Heating, Refrigerating and Air-Conditioning Engineers

See also: Air Conditioning, Heating and Refrigeration Institute

Many HVAC engineers are members of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). ASHRAE regularly organizes two annual technical committees and publishes recognized standards for HVAC design, which are updated every four years.^[56]

Another popular society is AHRI, which provides regular information on new refrigeration technology, and publishes relevant standards and codes.

Codes

[edit]

Codes such as the UMC and IMC do include much detail on installation requirements, however. Other useful reference materials include items from SMACNA, ACGIH, and technical trade journals.

American design standards are legislated in the Uniform Mechanical Code or International Mechanical Code. In certain states, counties, or cities, either of these codes may be adopted and amended via various legislative processes. These codes are updated and published by the International Association of Plumbing and Mechanical Officials (IAPMO) or the International Code Council (ICC) respectively, on a 3-year code development cycle. Typically, local building permit departments are charged with enforcement of these standards on private and certain public properties.

Technicians

[edit]

HVAC Technician

Occupation

Occupation type Vocational

Activity sectors Construction

Description

Education required Apprenticeship

Related jobs Carpenter, electrician, plumber, welder

An **HVAC technician** is a tradesman who specializes in heating, ventilation, air conditioning, and refrigeration. HVAC technicians in the US can receive training through formal training institutions, where most earn associate degrees. Training for HVAC

technicians includes classroom lectures and hands-on tasks, and can be followed by an apprenticeship wherein the recent graduate works alongside a professional HVAC technician for a temporary period.^[57] HVAC techs who have been trained can also be certified in areas such as air conditioning, heat pumps, gas heating, and commercial refrigeration.

United Kingdom

[edit]

The Chartered Institution of Building Services Engineers is a body that covers the essential Service (systems architecture) that allow buildings to operate. It includes the electrotechnical, heating, ventilating, air conditioning, refrigeration and plumbing industries. To train as a building services engineer, the academic requirements are GCSEs (A-C) / Standard Grades (1-3) in Maths and Science, which are important in measurements, planning and theory. Employers will often want a degree in a branch of engineering, such as building environment engineering, electrical engineering or mechanical engineering. To become a full member of CIBSE, and so also to be registered by the Engineering Council UK as a chartered engineer, engineers must also attain an Honours Degree and a master's degree in a relevant engineering subject.^[citation needed] CIBSE publishes several guides to HVAC design relevant to the UK market, and also the Republic of Ireland, Australia, New Zealand and Hong Kong. These guides include various recommended design criteria and standards, some of which are cited within the UK building regulations, and therefore form a legislative requirement for major building services works. The main guides are:

- Guide A: Environmental Design
- Guide B: Heating, Ventilating, Air Conditioning and Refrigeration
- Guide C: Reference Data
- Guide D: Transportation systems in Buildings
- Guide E: Fire Safety Engineering
- Guide F: Energy Efficiency in Buildings
- Guide G: Public Health Engineering
- Guide H: Building Control Systems
- Guide J: Weather, Solar and Illuminance Data
- Guide K: Electricity in Buildings
- Guide L: Sustainability
- Guide M: Maintenance Engineering and Management

Within the construction sector, it is the job of the building services engineer to design and oversee the installation and maintenance of the essential services such as gas,

electricity, water, heating and lighting, as well as many others. These all help to make buildings comfortable and healthy places to live and work in. Building Services is part of a sector that has over 51,000 businesses and employs represents 2–3% of the GDP.

Australia

[edit]

The Air Conditioning and Mechanical Contractors Association of Australia (AMCA), Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH), Australian Refrigeration Mechanical Association and CIBSE are responsible.

Asia

[edit]

Asian architectural temperature-control have different priorities than European methods. For example, Asian heating traditionally focuses on maintaining temperatures of objects such as the floor or furnishings such as Kotatsu tables and directly warming people, as opposed to the Western focus, in modern periods, on designing air systems.

Philippines

[edit]

The Philippine Society of Ventilating, Air Conditioning and Refrigerating Engineers (PSVARE) along with Philippine Society of Mechanical Engineers (PSME) govern on the codes and standards for HVAC / MVAC (MVAC means "mechanical ventilation and air conditioning") in the Philippines.

India

[edit]

The Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) was established to promote the HVAC industry in India. ISHRAE is an associate of ASHRAE. ISHRAE was founded at New Delhi^[58] in 1981 and a chapter was started in

Bangalore in 1989. Between 1989 & 1993, ISHRAE chapters were formed in all major cities in India.^[citation needed]

See also

[edit]

- Air speed (HVAC)
- Architectural engineering
- ASHRAE Handbook
- Auxiliary power unit
- Cleanroom
- Electric heating
- Fan coil unit
- Glossary of HVAC terms
- Head-end power
- Hotel electric power
- Mechanical engineering
- Outdoor wood-fired boiler
- Radiant cooling
- Sick building syndrome
- Uniform Codes
- Uniform Mechanical Code
- Ventilation (architecture)
- World Refrigeration Day
- Wrightsoft

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External links

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-  [Media related to Climate control at Wikimedia Commons](#)
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 - t
 - e
- Heating, ventilation, and air conditioning

**Fundamental
concepts**

- Air changes per hour
- Bake-out
- Building envelope
- Convection
- Dilution
- Domestic energy consumption
- Enthalpy
- Fluid dynamics
- Gas compressor
- Heat pump and refrigeration cycle
- Heat transfer
- Humidity
- Infiltration
- Latent heat
- Noise control
- Outgassing
- Particulates
- Psychrometrics
- Sensible heat
- Stack effect
- Thermal comfort
- Thermal destratification
- Thermal mass
- Thermodynamics
- Vapour pressure of water

Technology

- Absorption-compression heat pump
- Absorption refrigerator
- Air barrier
- Air conditioning
- Antifreeze
- Automobile air conditioning
- Autonomous building
- Building insulation materials
- Central heating
- Central solar heating
- Chilled beam
- Chilled water
- Constant air volume (CAV)
- Coolant
- Cross ventilation
- Dedicated outdoor air system (DOAS)
- Deep water source cooling
- Demand controlled ventilation (DCV)
- Displacement ventilation
- District cooling
- District heating
- Electric heating
- Energy recovery ventilation (ERV)
- Firestop
- Forced-air
- Forced-air gas
- Free cooling
- Heat recovery ventilation (HRV)
- Hybrid heat
- Hydronics
- Ice storage air conditioning
- Kitchen ventilation
- Mixed-mode ventilation
- Microgeneration
- Passive cooling
- Passive daytime radiative cooling
- Passive house
- Passive ventilation
- Radiant heating and cooling
- Radiant cooling
- Radiant heating
- Radon mitigation
- Refrigeration
- Renewable heat
- Room air distribution
- Solar air heat
- Solar combisystem
- Solar cooling
- Solar heating

- Air conditioner inverter
- Air door
- Air filter
- Air handler
- Air ionizer
- Air-mixing plenum
- Air purifier
- Air source heat pump
- Attic fan
- Automatic balancing valve
- Back boiler
- Barrier pipe
- Blast damper
- Boiler
- Centrifugal fan
- Ceramic heater
- Chiller
- Condensate pump
- Condenser
- Condensing boiler
- Convection heater
- Compressor
- Cooling tower
- Damper
- Dehumidifier
- Duct
- Economizer
- Electrostatic precipitator
- Evaporative cooler
- Evaporator
- Exhaust hood
- Expansion tank
- Fan
- Fan coil unit
- Fan filter unit
- Fan heater
- Fire damper
- Fireplace
- Fireplace insert
- Freeze stat
- Flue
- Freon
- Fume hood
- Furnace
- Gas compressor
- Gas heater
- Gasoline heater
- Grease duct
- Grille

**Measurement
and control**

- Air flow meter
- Aquastat
- BACnet
- Blower door
- Building automation
- Carbon dioxide sensor
- Clean air delivery rate (CADR)
- Control valve
- Gas detector
- Home energy monitor
- Humidistat
- HVAC control system
- Infrared thermometer
- Intelligent buildings
- LonWorks
- Minimum efficiency reporting value (MERV)
- Normal temperature and pressure (NTP)
- OpenTherm
- Programmable communicating thermostat
- Programmable thermostat
- Psychrometrics
- Room temperature
- Smart thermostat
- Standard temperature and pressure (STP)
- Thermographic camera
- Thermostat
- Thermostatic radiator valve
- Architectural acoustics
- Architectural engineering
- Architectural technologist
- Building services engineering
- Building information modeling (BIM)
- Deep energy retrofit
- Duct cleaning
- Duct leakage testing
- Environmental engineering
- Hydronic balancing
- Kitchen exhaust cleaning
- Mechanical engineering
- Mechanical, electrical, and plumbing
- Mold growth, assessment, and remediation
- Refrigerant reclamation
- Testing, adjusting, balancing

**Professions,
trades,
and services**

Industry organizations

- AHRI
- AMCA
- ASHRAE
- ASTM International
- BRE
- BSRIA
- CIBSE
- Institute of Refrigeration
- IIR
- LEED
- SMACNA
- UMC

Health and safety

- Indoor air quality (IAQ)
- Passive smoking
- Sick building syndrome (SBS)
- Volatile organic compound (VOC)
- ASHRAE Handbook
- Building science
- Fireproofing

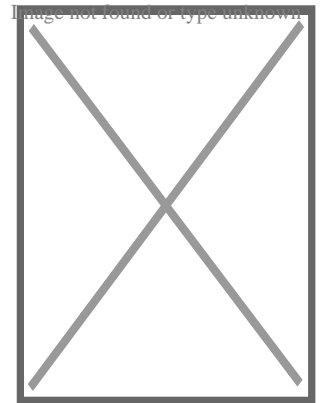
See also

- Glossary of HVAC terms
- Warm Spaces
- World Refrigeration Day
- Template:Home automation
- Template:Solar energy

- v
- t
- e

Home automation

Elements		<ul style="list-style-type: none"> ○ Actuators ○ Hardware controllers ○ Sensors
	Wired	<ul style="list-style-type: none"> ○ Cable (xDSL) ○ Optical fiber ○ Powerline <ul style="list-style-type: none"> ○ PLCBUS ○ Universal powerline bus (UPB) ○ X10 ○ Radio frequency <ul style="list-style-type: none"> ○ Bluetooth ○ Bluetooth Low Energy ○ DECT ○ EnOcean ○ GPRS ○ MyriNet ○ One-Net ○ Thread ○ UMTS ○ Wi-Fi ○ Zigbee ○ Z-Wave
Interconnection type	Wireless	
	Both	<ul style="list-style-type: none"> ○ Infrared (Consumer IR) ○ Insteon ○ KNX ○ Matter
System		
	Device interconnection	<ul style="list-style-type: none"> ○ Bluetooth ○ Bluetooth Low Energy ○ FireWire ○ IrDA ○ USB ○ Zigbee ○ AllJoyn ○ Bus SCS with OpenWebNet ○ C-Bus (protocol) ○ CEBus ○ EnOcean ○ EHS ○ Insteon ○ IP500 ○ Luxom
Network technologies, by function	Control and automation	



- Audio and video
- Heating, ventilation, and air conditioning
- Lighting control system
- Other systems
- Tasks**
 - Robotics
 - Security
 - Thermostat automation
 - Gateway
 - Smart home hub
 - Costs
- Other**
 - Mesh networking
 - Organizations
 - Smart grid

See also

Home of the future
Building automation
Floor plan
Home automation
Home energy monitor
Home network
Home server
House navigation system
INTEGER Millennium House
The House for the Future
Ubiquitous computing
Xanadu Houses

Authority control databases: National    [Edit this at Wikidata](#)

About Durham Supply Inc

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Photo

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Things To Do in Tulsa County

Photo

Image not found or type unknown

The Blue Dome

4.5 (60)

Photo

Image not found or type unknown

Tours of Tulsa

4.9 (291)

Photo

Philbrook Museum of Art

4.8 (3790)

Photo

Image not found or type unknown

Route 66 Historical Village

4.4 (718)

Photo

Image not found or type unknown

Tulsa Botanic Garden

4.7 (1397)

Photo

Golden Driller Statue

4.6 (1935)

Driving Directions in Tulsa County

Driving Directions From Tulsa VA Behavioral Medicine Clinic to Durham Supply Inc

Driving Directions From East Central High School to Durham Supply Inc

Driving Directions From Oakwood Homes to Durham Supply Inc

Driving Directions From Church on the Move Tulsa to Durham Supply Inc

Driving Directions From Lincoln Christian School to Durham Supply Inc

Furnace store

Heating contractor

HVAC contractor

Mobile Home Furnace Installation

Mobile Home Air Conditioning Installation Services

Mobile Home Hvac Repair

Driving Directions From Tours of Tulsa to Durham Supply Inc

Driving Directions From Bob Dylan Center to Durham Supply Inc

Driving Directions From Philbrook Museum of Art to Durham Supply Inc

Driving Directions From Bob Dylan Center to Durham Supply Inc

Driving Directions From Tulsa Air and Space Museum & Planetarium to Durham Supply Inc

Driving Directions From Woodward Park and Gardens to Durham Supply Inc

Mobile home supply store

Air conditioning repair service

Air conditioning store

Air conditioning system supplier

Furnace repair service

Reviews for Durham Supply Inc

Durham Supply Inc

Image not found or type unknown

Gerald Clifford Brewster

(5)

We will see, the storm door I bought says on the tag it's 36x80, but it's 34x80. If they return it.....they had no problems returning it. And it was no fault of there's, you measure a mobile home door different than a standard door!

Durham Supply Inc

Image not found or type unknown

B Mann

(5)

I was in need of some items for a double wide that I am remodeling and this place is the only place in town that had what I needed (I didn't even try the other rude place)while I was there I learned the other place that was in Tulsa that also sold mobile home supplies went out of business (no wonder the last time I was in there they were VERY RUDE and high priced) I like the way Dunham does business they answered all my questions and got me the supplies I needed, very friendly, I will be back to purchase the rest of my items when the time comes.

Durham Supply Inc

Image not found or type unknown

Ty Spears

(5)

Bought a door/storm door combo. Turns out it was the wrong size. They swapped it out, quick and easy no problems. Very helpful in explaining the size differences from standard door sizes.

Durham Supply Inc

Image not found or type unknown

Dennis Champion

(5)

Durham supply and Royal supply seems to find the most helpful and friendly people to work in their stores, we are based out of Kansas City out here for a few remodels and these guys treated us like we've gone there for years.

Exploring Major Brands for Mobile Home Furnace Installations [View GBP](#)

Frequently Asked Questions

What are the top brands for mobile home furnace installations?

The top brands for mobile home furnace installations typically include Coleman, Nordyne (now known as Nortek Global HVAC), Miller, and Intertherm. These brands are known for their reliability and compatibility with mobile homes.

How do I determine the right size of a furnace for my mobile home?

To determine the right size of a furnace, calculate the square footage of your mobile home and consider insulation quality and climate zone. A heating professional can perform a Manual J load calculation to ensure accurate sizing.

Are there energy-efficient options available among these major brands?

Yes, many major brands offer energy-efficient models designed specifically for mobile homes. Look for furnaces with high Annual Fuel Utilization Efficiency (AFUE) ratings and those that are ENERGY STAR certified.

What should I consider when selecting an HVAC contractor for installation?

When selecting an HVAC contractor, consider their experience with mobile home systems, licensing and insurance status, customer reviews, and whether they provide detailed estimates and warranties on their work.

Royal Supply Inc

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State : OK

Zip : 73149

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Google Business Profile

Company Website : <https://royal-durhamsupply.com/locations/oklahoma-city-oklahoma/>

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