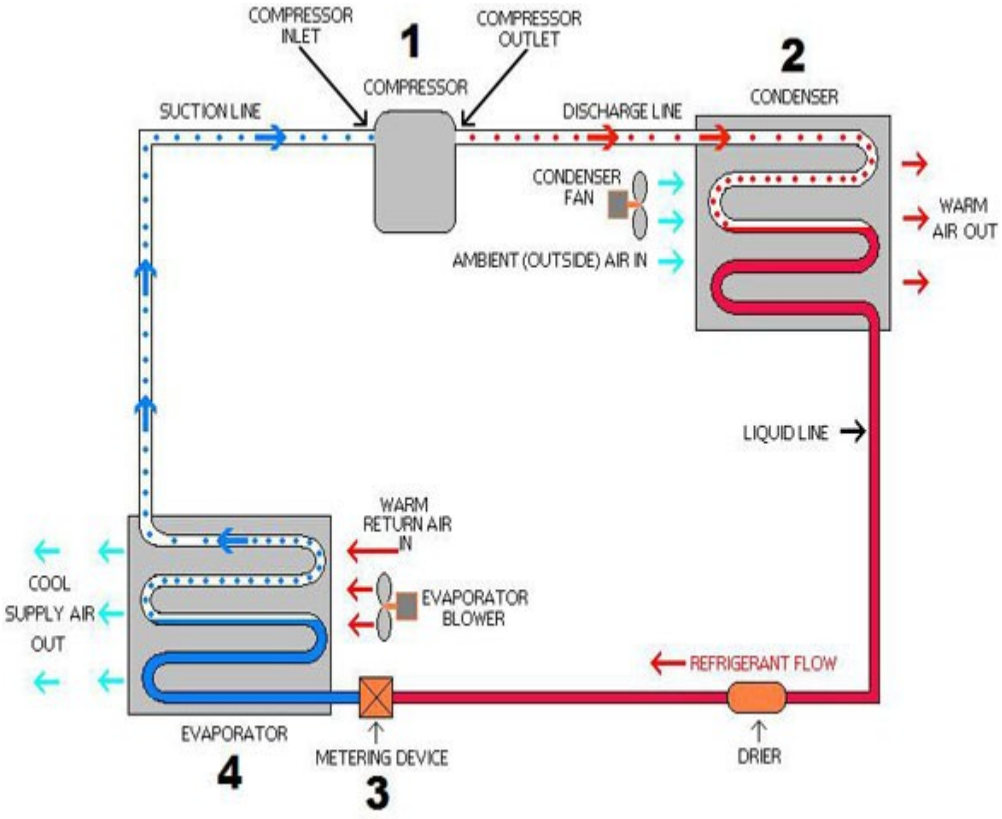
Air Conditioning Circuit and Cycle Diagram

Please feel free to copy this air conditioning circuit and cycle diagram and print it out.



The component at #1 in this air conditioning circuit and cycle diagram is the compressor.

The compressor is the heart of the system; it keeps the refrigerant flowing through the system at specific rates of flow, and at specific pressures.

It takes refrigerant vapor in from the low pressure side of the circuit, and discharges it at a much higher pressure into the high side of the circuit.

The rate of flow through the system will depend on the size of the unit,

And the operating pressures will depend on the refrigerant being used and the desired evaporator temperature.

The component at #2 in this air conditioning circuit and cycle diagram is the condenser.

The red dots inside the piping represent discharge vapor.

The solid red color represents high pressure liquid refrigerant.

Most air cooled air conditioning and refrigeration systems are designed so that the refrigerant will condense at a temperature about 25 to 30 degrees above outside ambient air temperature.

When the hot refrigerant vapor discharged from the compressor travels through the condenser, the cool air flowing through the condenser coil absorbs enough heat from the vapor to cause it to condense.

If the outside air temperature is 80 degrees, the system is designed so that the temperature of the refrigerant, right at the point where it first condenses, will be about 105 to 115 degrees.

Why do we want the refrigerant to condense at this relatively high temperature?

So that the air will be very cold relative to the temperature of the discharge vapor,

Which will allow the latent heat energy in the vapor to transfer over to that relatively cold air,

And cause the refrigerant to condense.

This transfer of heat from the vapor to the flowing air is what makes hot air blow out of your air conditioner's condensing unit.

At this stage in the air conditioning circuit and cycle diagram, high pressure liquid refrigerant will flow down the liquid line, through a filter drier that is designed to prevent contaminants from flowing through the system, and on to the metering device.

The metering device, component #3 on this air conditioning circuit and cycle diagram, is the dividing point between the high pressure and low pressure sides of the system,

And is designed to maintain a specific rate of flow of refrigerant into the low side of the system.

If the wrong capacity of metering device is used, or if there is a problem with the metering device,

An incorrect quantity of refrigerant will flow into the evaporator.

When the refrigerant passes through the metering device, it drops from about 225 psi to about 70 psi,

It also drops in temperature from about 110 degrees to about 40 degrees,

It starts evaporating immediately,

And it wouldn't be too inaccurate to imagine it acting like warm soda when you shake the bottle and pop the top off.

It shoots out into the evaporator foaming, bubbling, and boiling,

And remember, it's at a low pressure, so it's only boiling at about 40 degrees F.

And that brings us to the evaporator, component #4 in the air conditioning circuit and cycle diagram.

There will be relatively warm air flowing over the evaporator coil, lets say about 80 degrees.

The air conditiong system is designed so that the refrigerant will evaporate in the evaporator at a temperature of about 40 degrees, so that it will be cold compared to the warm air flowing over it.

The system is designed so that the heat in the warm air flowing over the evaporator will be absorbed by the cold evaporating refrigerant.

This cools the air flowing over the evaporator, and is the reason cold air blows out of your air conditioner.

I hope this air conditioning circuit and cycle diagram has helped you understand air conditioning systems, and once again, feel to copy it and print it out.

You'll find a more complete diagram that you can use for troubleshooting, with some tips about the operating characterisitcs to look for, in our System Evaluation Manual; and please, feel free to contact us with any specific HVAC questions you might have, including questions about air conditioning on Guam, and refrigeration on Guam.

Are you learning the HVAC Trade "on the job"?
If you would be interested in the possibility of studying at home to develop your potential to become the finest HVAC Technician you possibly can; we highly recommend that you contact Penn Foster Career School and request the free, no-obligation information brochure about their complete, accredited HVAC Technician course.
It won't take even 5 minutes, and might change your whole future.
You'll find a brief review of the course on our HVAC Training page.

Return from Air Conditioning Circuit and Cycle Diagram to the Air Conditioning and Refrigeration Guide home page.

Refrigeration Cycle Explained Easy Way

This is a refrigeration cycle diagram of regular central

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Sears Ac

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Discussion

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Hvac Problems

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Read more: http://www.central-air-conditioner-and-refrigeration.com/Refrigeration_Cycle.html#ixzz1ODo4H25J

Central air conditioner compressors

It made the refrigerant flows!

What are air conditioner compressors?

Air conditioning compressor is the heart of the air conditioner units. It's the mechanical components that use electricity and capacitor as the single energy source to operate it.

The air conditioning compressor is the ac parts that cause the air conditioner refrigerant to flows in a cycle.

What are the types of air conditioning compressors?

There are five main types of air conditioner compressors:

1. Reciprocating
2. Rotary compressor
3. Centrifugal compressor
4. screw compressors
5. Scroll compressors

All five groups of air conditioner compressors work the same way, but their internal methods of compressing refrigerant vapors are different.

The most common compressor is the reciprocating compressor. It comes into two domes or housing:

1. Open compressors
2. Hermetic compressors

Hermetic compressor is the most common air conditioner compressors found in residential AC units and light commercial units. So, the only compressor I'll being focusing here is hermetic compressors.

Hermetic compressor comes into two types:

1. Sealed or welded hermetic compressors
2. Semi-hermetic (this compressor has nuts and bolts holding it together.)

Sealed hermetic compressors

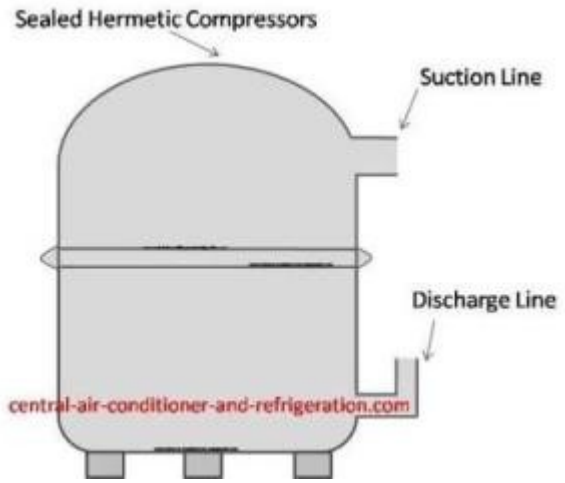
Bryant Hvac
Lennox Ac
Rheem Ac
Heil Hvac
Tempstar Hvac
Sears Ac
Ruud Ac
Amana Hvac
Gibson Hvac
American Standard
Janitrol Ac
Armstrong Hvac
Discussion
Ac Question
Central Air Cost
Hvac Problems
Ac Smells Forum
Ac Ice Discuss It
Ac Noise
Serial and Model

Welded hermetic compressors aka tin can or sealed hermetic are throwaway compressors. There is no way of get inside the compressor, unless it's cut open.

There're few companies that open this compressor, they are specialize this kind of works. Air conditioner compressors manufacture opens the sealed hermetic compressors to examine it. Otherwise, its a throwaway.

In sealed hermetic compressors the motor and crankshaft are in vertical position. It used the suction refrigeration from the air conditioner evaporator to cool the internal compressor at an operating temperature.

The air conditioner compressors have a safety device inside to protect the compressor from heating. This device is internal overload. The air conditioning compressor is the most expensive AC parts in condenser units; it's wise to protect the compressor.



In a hermetic compressors there're two important tubes that welded with the hermetic shell. These two tubes are:

1. Suction line
2. Discharge line

The suction line is the larger line connecting to the indoor air conditioner evaporator. The air conditioner compressors pull the refrigerant through the suction line and releases it to the air conditioner condenser through the discharge line.

In split-central air conditioner units, the suction is always insulating to prevent the cool refrigerant from absorbing outside heat.

Semi-hermetic compressors

This is the air conditioning compressors that have nuts and bolts. The motor and the compressor are inside the heavy iron cast. This is the compressor that can be fixed by removing the bolts and shells that holding it together.

There aren't many residential that used these types of compressor, but you could find in larger home and light commercial. It can be fixed in the field, if you have the necessary air conditioner equipment.

Central air conditioning compressor Video

Make sure to press the Play button in the player controls to watch it. Enjoy!

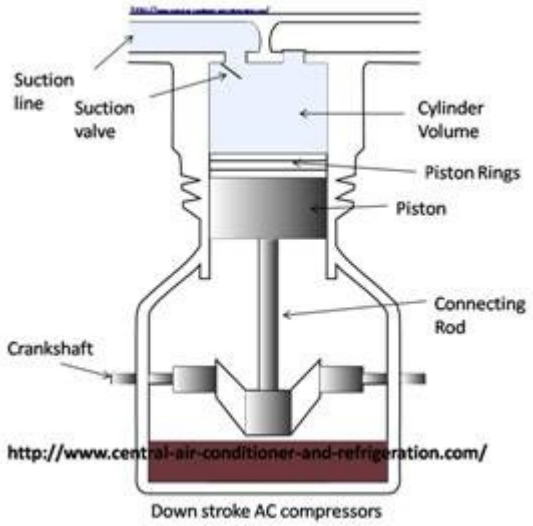
Central air conditioner compressor Training Videos made by Danfoss

How does a central air conditioner compressor works?

The central air conditioner compressor works by using an electricity to energize the motor; which it turns cause compressor crankshaft to rotates.

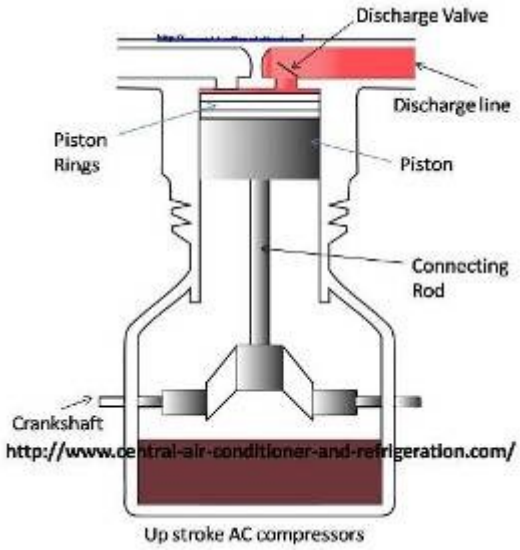
Reciprocating compressors are a piston-cylinder type of pump. The main parts include a cylinder, piston, connecting rod, crankshaft, cylinder head and valves. The operating cycle of a reciprocating compressor is shown below.

On the down stroke of the piston, a low pressure area is created between the top of the piston, the cylinder head and the suction line of the air conditioning evaporator. Cold refrigerant vapor rushes through the suction valve inlet and into the low pressure area.



Down stroke AC compressors

On the up stroke, the suction valve closes and the exhaust (discharge) valve is forced open with the increasing pressure. The vapor is compressed and forced into the discharge (high) side of the refrigeration system.



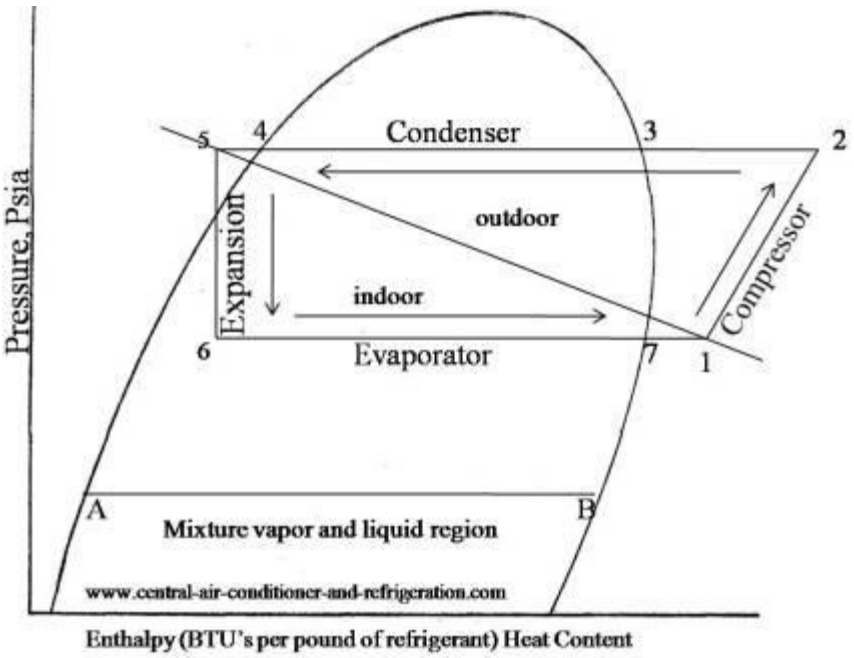
Up stroke AC compressors

When the piston reaches the top of the cylinder, the discharge valve closes, and the suction valve opens as the piston starts down again drawing in cold refrigerant vapor to complete the cycle.

Note that the connecting rod attached between the crankshaft and piston serves to change rotary motion into reciprocating (back and forth) motion.

The piston rings prevent the vapor from escaping between the piston and cylinder walls and improve the operating efficiency.

The compressor housing or crankcase contains the bearing surfaces for the crankshaft and stores the oil that lubricates the compressor parts.



The process of the air conditioning compressors are showed between points 1 and 2 on the PH chart.

In split- central air conditioner units, the compressor is located outside within the condenser units. It's a vapor pump!

Compressors produce a pressure different between the low side (suction pressure) and high sides (discharge pressure) of the refrigeration system.

This is achieved by pulling of low pressure, low temperature, superheated refrigerant vapor from the suction (evaporator) side.

It pulls the correct amount of refrigerant to fill the volume. The refrigerant goes through the compressor, after it crosses the compressor it then creates a high temperature, high pressure superheated refrigerant vapor to the high pressure side (air conditioner condenser side).

The compression of the vapor causes the transfer of heat energy to flows from the low side to the high side of the system.

As the air conditioning compressors compression the refrigerant, additional heat is added to the refrigerant. These heats are:

1. Heat of compression
2. Mechanical friction heat
3. Compressors winding heat
4. Other suction line heat

The pressure different created by the operation of the compressor is responsible for refrigerant flow through the refrigeration cycle.

Read other **central air conditioner parts**

Air Conditioner Condenser

Air Conditioner expansion valve

Air Conditioner evaporator

Back to Central Air Conditioner and Refrigeration Cycle from Air Conditioner Compressors

Central air conditioner fan
Two Fan Motor in Central Ac Unit

Central Air Conditioner Fan

All residential central air conditioner units will have two fan motor.

These motor are:

- Blower motor
- Condenser unit motor

Blower motor aka indoor blower

The blower motor is located inside a house in split central air conditioning unit. If its package unit, it's located outside with other.

What does it do?

The blower or fan is a device that produces airflow or air movement. It provides the pressure difference to force the air into the duct work and through the supply vents.

The amount of airflow it provides is depending on the amount of airflow it receives. For example, a dirty filter is blocking airflow to the blower, what happen? It didn't receive adequate airflow, so it produces less airflow.

There are other things that affect the airflow. Like the conditioner of the motor, the wheel and the housing. That is why; some technician recommends you clean the indoor blower.

It's always good idea to clean it. The evaporator coil provides the cool air and the blower move these air. Without a clean blade, it doesn't quite work at it max. It's wasting energy.

Some central air conditioning units will have different blower speed for heating and cooling air. It takes more energy to move cold air than hot air. So, it will have different speed for it.

There are four parts to blower:

- The motor
- The wheel
- Belly band mount
- The housing

The blower's motor and it features

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American Standard
Janitrol Ac
Armstrong Hvac
Discussion
Ac Question
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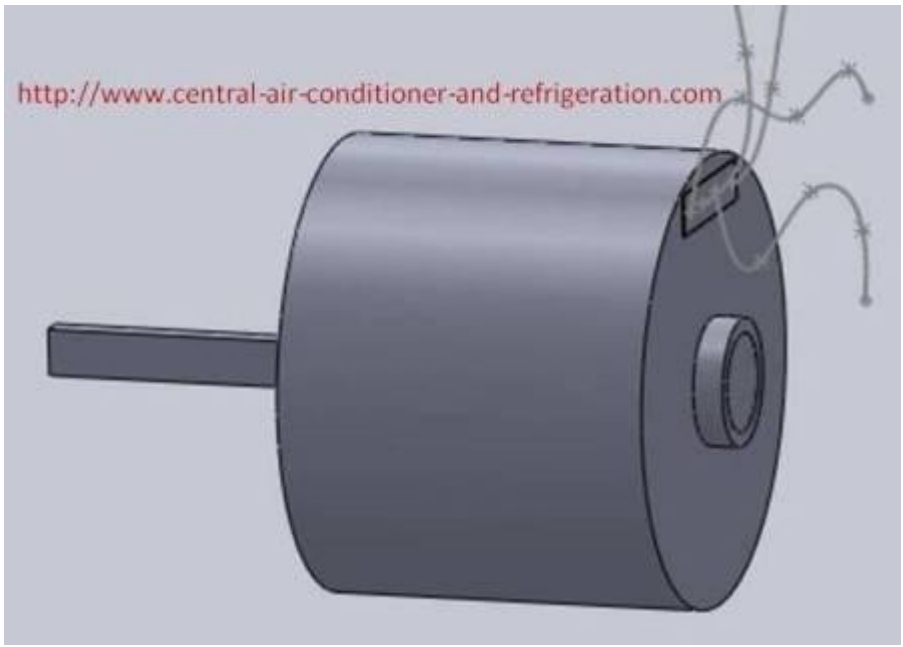


Electrical Wire Diagram

All air conditioner fans motor will have an electrical wire diagram sticker on it. Here is information you will be seen on the motor diagram.

Size

Most residential central air conditioner unit motor will be the standard size known as frame. For example, frame 48Y (5-5/8 inches in diameter) motor.

Hp

The horsepower of the air conditioner fan range from 1/8 to ¾ (1/8, 1/6, 1/5, ¼, 1/3, ½, 1)

Voltage

The residential voltage on most motor is 208-230. One of the motor wires will going to L1 or L2, it should have that on the wires diagram.

Multiple speeds

Some motor will have multiple speed, it speeds will be High, medium, medium low and low. There will be a diagram on the motor telling you what color wire is for what speed.

Rotation

Most air conditioner fan is reversible. It could rotate clockwise (CW) and counter clock wise (CCW). There should be label and reversible wire on the motor.

Speed (R.P.M)

R.P.M or revelations per minute for the motors are range from 1200 to

1050. This information is also on the motor's label.

Amps (current)

The air conditioner motor should have AMPS label on the motor. It should have amps range from 1.0, 1.4, 1.8 etc.

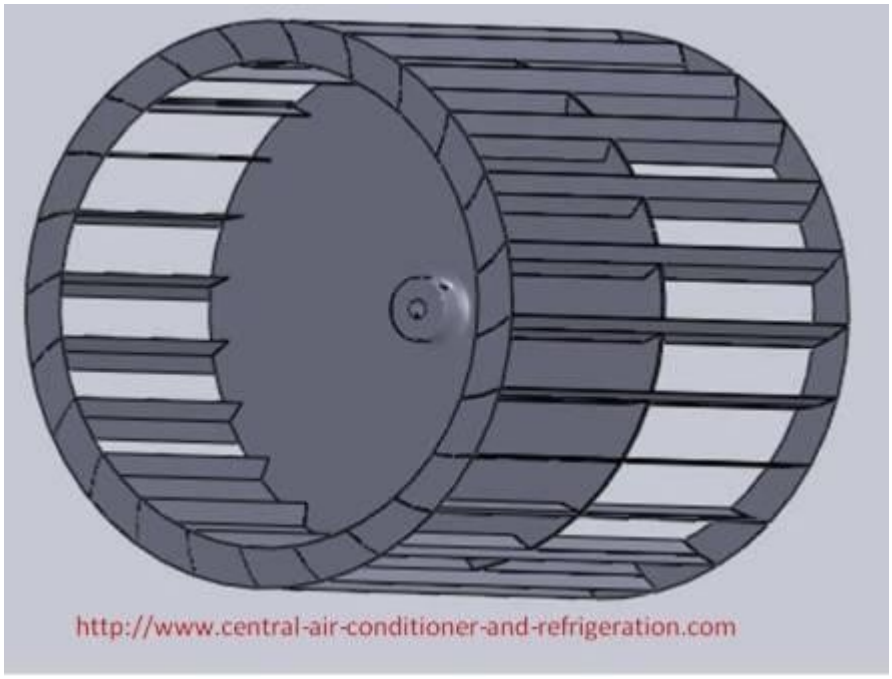
Capacitor

The blower's capacitor is a run capacitor. The motor will have brown with white stripe and solid brown wire attack to the capacitor. (Sometime there will just be two solid brown wires from the motor).

It capacitor are in the range of 5 to 7.5 MFD (microfarad) or UF. The capacitor has a round or oval shape.

Here is Capacitor Video by DrZarkloff

The blower's wheel



The motor's shaft is attached to the wheel. The wheel causes the airflow. If the wheel is dirty and messing, it will causes the motor to work extra hard.

It always good ideas to clean the wheel every years (depend how dirty you house is and how often you change the filter).

The Belly band mount

The belly band is a strap that wraps around the motor to secure it. You will see another brackets screw to the strap.

The purpose of the belly band is to secure the motor into the house. There are different types of strap that often used in motor, but belly band is most common.

The housing

The housing is what holds the motor and the wheel together. The belly band screw into the housing and it hold the motor there.

The housing is a venturi that allows airflow in straight line from one side of the fan to the other side. Air conditioner fan pulls in low pressure air from one side and forces it into high pressure air.

The force that moves the low pressure air into the high pressure is centrifugal force.

Condenser unit motor (fan)

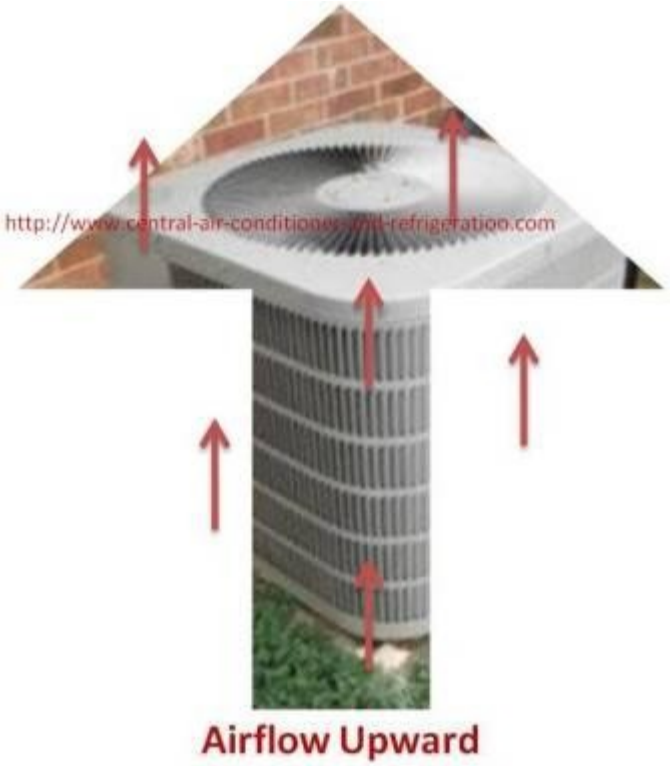
The condenser unit rejects the heat from the evaporator coils, and the condenser fan helps with removing that heat.

The features of the condenser fan motors are quite the same as the blower motor. Except the condenser fan does not have wheel or housing. It has the motor and the fan's blade.

Some split-central air conditioning unit will have dual capacitor for the compressor and the condenser fan. Dual capacitor is capacitor that does two things.

Watch for condenser airflow

Experiences and school taught us that the airflow to a condenser unit supposed to be upward. The fan supposed to reject the heat upward and not downward.



I had work on central air conditioner units and the entire neighbors have the airflow downward. What is their reason for that? Not sure.

Airflow upward is efficient and logical to me. Here is my reason for that. Over the year, leaves, debris and dirty tend to be inside the condenser units. If the air conditioner fan were to force air downward, it would force the foreign material into the aluminum coil and trap it there.

It's logical and efficient for the condenser fan to suck in the air from the surround condenser area and force it upward.

If your condenser fan is force air downward, ask your technician for his reason. If he thing it proper to have it flow upward, he could always reverse the rotation of the fan.

Return to central air conditoner and refrigeration cycle from air conditioner fan

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Home Air Conditioner Maintenance
Longer Last Central Air Conditioning Unit

Home air conditioner maintenance Part 1

Outside Unit (condenser units)

Suction Line

There are two copper lines attach to the condenser unit. It's the suction and the liquid line.

Go outside and you should see it. The big copper line is Suction Line. It needs to be insulated. The suction lines insulation occurs from the condenser unit to indoor evaporator unit.

Why does suction line need to be insulating?

It's to prevent the cold suction line from absorb outdoor heat. You will lose efficiency by not insulating the suction lines. If you were to touch it, it would feel cold. Well, that cold refrigerant needs to be absorbing heat from the indoor, not outdoor heat.

The suction line is always insulated in split central air conditioner unit. As the central ac units get older, the insulator tends to tore apart and you will have to insulate it or pay technician.

This is part of the home air conditioner maintenance everyone could do. Every technician will put in new insulator if he sees the old one tore apart and it will cost you.

You could buy the insulator at your local home improvement story for few bucks and insulate the suction line (big copper line) yourself.

Proper Refrigerant Level

Technician uses manufacture requirement or slide chart to determine the correct amount of refrigerant the central air conditioner needs.

Bryant Hvac
Lennox Ac
Rheem Ac
Heil Hvac
Tempstar Hvac
Sears Ac
Ruud Ac
Amana Hvac
Gibson Hvac
American Standard
Janitrol Ac
Armstrong Hvac
Discussion
Ac Question
Central Air Cost
Hvac Problems
Ac Smells Forum
Ac Ice Discuss It
Ac Noise
Serial and Model

They find the correct amount of refrigerant by finding the correct superheat or subcooling temperature. It hard to determine how much refrigerant your close-loop system need if the condenser coil and the evaporator coil is dirty. This is one of the home air conditioner maintenance should be done by technician.

Is Compressor Function Properly?

The compressor is the component that causes the Freon to flows throughout the system. If the compressor is not working properly, it'll affect the overall efficiency.

In normal operation, the air conditioner compressor should be able to pull 20 inches Hg. vacuum on it suction or low side. This should be in the tune-up section and maintenance.

Clean the Condenser Coil

The condenser coil is located outside. All air conditioner units run under the principle of heat transfer.

Air conditioning unit is the ideas of remove absorb heat from one location and reject it to different location.

In split central air conditioner unit, the condenser coil is where the heat is being rejected to. If it has debris or dirt; it will act as insulator and prevent the heat transfer to occur faster.

Dirty condenser coil will cause the central air conditioning unit to be inefficient. If the coil is dirty, you have to clean it or pay technician to clean it with specific chemical. Water won't help if you have stain or really dirty coils.

If you live near the ocean, it is best you clean the condenser once a month. Salt air causes the condenser to corrosive. I do realize that condenser units are coated with corrosive resistant. Just to be on the safe side.

This is one of the home air conditioner maintenance any homeowner could do. If you decide to clean the outdoor coil, try not to spray water in the electrical components (you can't see it). Just spray on the coil only.

Condenser Unit Clearance

Make sure there is not object near or surround the condenser unit. These things could affect the ability of the condenser to rejects heat.

Try to keeping large object 2 feet or greater away from it (yeah, I just pick that number out of the air).

If you have bushes or flower surrounding the condenser unit, try to trim it downs or remove it.

Straight Condenser Coil Fins

The condenser coil fins tend to be bending by children or object. Bend fins has the same affect as dirty coil. If you have a lot aluminum fins that bend and your home is not cooling, the first thing you should do is straight the fins.

The technician use fins comb to straight the aluminum fins. It's time consuming trying to straight the fins. You could buy fins comb on Amazon or any hardware online stories. This is home air conditioner maintenance that does not cost much, except the fins comb.

Is The Condenser Unit Level?

Check to see if you condenser units are level equally. If it not level equally, the vibration from the compressor and the fan motor will cause the round or square metal box to shift to least level direction and slow it will cause damage to the outdoor unit.

Keep Dog Away From Condenser Unit

Dog and central air conditioning maintenance, no I'm not losing my mind! I realize it not part of the home air conditioner maintenance.

If you have dog, trying to keep it always from the condenser unit. Dog urines will eat the aluminum coil away.

Once the aluminum fins rust and collapse, you will have to replace the entire condenser unit. No, contractor can't just replace the damage fins; it would be great if they could.

I don't know how fast the urine starts reacting with the aluminum. If you smell dog urines around the condenser unit, try to clean it right away. If you don't, it will cause you a lot of money to replace it.

Solution

You could train you dog not to pee in the condenser unit or build chain links fence around the condenser unit. The fence should be one or two feet always from the condenser unit and its removable. It also should be higher than the dog's height.

Check for oil leaks

The leak sometime occurs between copper joint. If the joint is leaking, you should see oil underneath it. You could look for it in the condenser coil or the liquid and suction line or in the evaporator coil.

Return to Central Air Conditioner and Refrigeration Cycle from Home Air Conditioner Maintenance

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Air Conditioning History

Air conditioning history and **history of refrigeration** – Find out who invented the air conditioning.

Who really invented the air conditioning? Is Willis Carrier the father of air conditioner? That question is still debatable, but here is a brief article of air conditioning history.

Some people consider Willis Haviland Carrier to be the "father of air conditioning" or the "father of cool" yet, so many people had already contributed to the invention of air conditioning before his innovations.

He was the first to made the air conditioner units. However, the idea of air conditioning existed before the first residential central air conditioners were even designed.

In the beginning – they understand the principle of refrigeration and air conditioning (cooling)

The basic theory of air conditioning can be obtained from the second law of thermodynamics, which states that heat flows from hot areas to cold, not the other way around.

If its energy is to flow from cold to hot, it needs additional energy. It seems an easy notion, but it still took over a century for basic air conditioning units to manufactured and designed.

Ancient Greeks, Jews and Persians understands this theory and they invented the ideas of air conditioning. They collected natural ice and snow and used it to cool wine, food and delicacies. They used wood or sawdust to insulate the ice and reduce the transfer of heat to stop the ice from melting.

Medieval Persians used an intricate building design that used cisterns and wind towers to cool buildings during the hot season. The cisterns were large open pools in courtyards which collected rainwater.

This rainwater then evaporated, causing the air in the courtyards to become cooler. The wind towers were designed with windows that would catch wind and internal vanes that directed the flow of air down into the building.

History of refrigeration begin with...?

Air conditioning units can trace as far as 1748. At Glasgow University William Cullen demonstrated the first design of artificial refrigeration. He used an air pump to create a partial vacuum.

The water inside the evacuated chamber was brought to a boil; in which, the most energetic molecules became vapor. The liquid water's temperature fell rapidly causing it to eventually freeze.

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According to sources, Cullen used ether instead of water. Despite the core area of Cullen's concept, his invention was never use.

The history of refrigeration didn't started with William Cullen, Ancient Greeks, Jews or Persians . Some evident indicated that the Chinese understand refrigeration concept and they were the first to used that refrigeration ideas.

Although the Chinese, Ancient Greeks, Jew or Persians understood the ideas; William Cullen, Oliver Evans, and Willis Carrier invented the commercial air conditioner units. They were consider the greatest people in air conditioning history.

Oliver Evans invented vapor compression system

In the late 1700's, Oliver Evans discover air cooling method. Born in 1755 in Delaware, Oliver worked as a wagon maker, and studied math and science.

He soon gained a reputation for building all kinds of laborsaving devices, but his attention caught by the latest power source – steam. Oliver set about producing his own energy efficient engine, and by 1804; he had accomplished it.

Evan's Colombian High-pressure Engine was the first step for the American's journey towards a power based industry. Another of Evan's designs was a vapor compression system which included an ac compressor, an ac condenser and a cooling coil, which dramatically altered how air conditioning work and it impact on air conditioning history.

Evans died in 1819 without manufacturing the design, but his friend, Jacob Perkins, followed Evan's lead and built the prototype of a modern air conditioning system.

Air conditioner history greatest doctor

It was almost a century later when an American physician, Doctor John Gorrie, who created a device, that would be the first step to modern refrigeration and air conditioning. Gorrie was a doctor in charge of the U.S Marine Hospital in Apalachicola, Florida.

He was the first American to make an attempt to cool his hospitals and he created a device that blew air over a bucket of ice, thus creating a cooling breeze. During the 1830's his invention was used for cooling the wards of the patients suffering from malaria and yellow fever.

In 1851, John Gorrie was granted a patent for the first commercialized machine used for refrigeration and air conditioner units. Gorrie's advanced system used a pump to compress air which in turn made the air hot.

He removed the compressed air by circulating it with cold water before allowing it to expand. The expansion cooled the air to a temperature lows enough to freeze water. Gorrie's system is not too different from our Glaswegian professor, William Cullen.

Gorrie hoped to eventually put his ice making machine to use by regulating the temperature of entire buildings. He went so far as to

manufacturing a device that would cool down entire cities. Although his prototype did not work without leaking, he was still granted a patent in 1851.

Alexander Twining

Alexander Twining wasn't considers as the father of air conditioning, but his experiment with vapor-compression refrigeration in 1848 contribute greatly to air conditioning history.

He obtained patents in 1850 and 1853 for his contribution. He is credited with having started commercial refrigeration in the United States by 1856.

Twining graduated from Yale in 1820, and became a professor of mathematics, civil engineering, and astronomy at Middle bury College from 1839 till 1849. He was employed as a civil engineer on various railways and canals, and discovered the first practical method of producing ice in bulk quantities by artificial means.

Michael Faraday contribution to air conditioning history

A British scientist, Michael Faraday, was originally recruited as a bookbinder at the age of 14. It was during his employment that he became immersed in the chemical works of the current time.

He spent years on scientific work, which dealt mainly with chemicals. He was responsible for liquefying chlorine and some other gases. In 1845, Faraday discovered that intense magnetic fields can take the place of polarized light and this is known today as the Faraday Effect.

Faraday set up a series of experiments, mainly based on electricity. During his work, he discovered that if liquefied ammonia evaporated, the air that it evaporated into would chill.

Michael Faraday is considered by many as the greatest experimentalism whoever lived, and his pioneering experiments and conclusions are commonly used in modern day science.

Air Conditioning History Part 2

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History of Air Conditioning

History of air conditioning part 1

Navel engineers, who attempt to save the president life with air conditioning (cooling)

Another notable early attempt at air conditioning came during the brief presidency of James Garfield. In 1881 as he lay on his deathbed, navel engineers concocted a box-like structure which contained melted ice.

In the ice he soaked material and used a fan to blow the cold, wet clothes to lower the temperature. The unusual method worked and lowered the temperature by 20 degrees, although the process did consume half of a million pounds of ice in just two month period!

Although navel engineers attempt to save the president was not known to some people, but it's interesting fact collection to the history of air conditioning.

James Harrison role in air conditioning history

James Harrison is another pioneer in the topic of refrigeration. His first contributions to history of air conditioning begins in 1851, when he made the first mechanical ice making machine and it began operating on the banks of the Barwon River.

Harrison's first commercial ice making machines followed in 1854 and his patented for an ether liquid-vapor compression refrigeration system was granted in 1855.

Harrison used a compressor on a refrigerant gas, and the compressed gas passed through the condenser, where it cooled down and liquefied. The liquefied gas then circulated through the refrigeration coils thus vaporizing again and cooling down the surrounding system.

Though he had a commercial success establishing a second ice company in Sydney in 1860, he pondered on how to compete against

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Hvac Problems
Ac Smells Forum
Ac Ice Discuss It

the American advantage of un-refrigerated beef sales to the United Kingdom.

He packed the frozen meat for the voyage and prepared the ship for a trip to Norfolk, England. He chose to use a cold room instead of installing a refrigeration system on the ship, but his experiment failed when the ice melted faster than expected.

Harrison continued to work on methods of refrigeration with an emphasis on producing a system that would allow the export of meat from Australia to England.

At the Melbourne exhibition of 1872-73, Harrison showed his proposal, where the meat would be frozen in the refrigeration plant and stored in an insulated "cold bank" on board the ship.

The ship set sail in July of 1873, but the system failed again when the ice ran out before the journey was completed. The meat defrosted and had to be thrown overboard.

Harrison's experiments were not in vain, however, it was not long before meat was successfully being transported through the tropics using similar techniques to his.

Greater discovery in the history of air conditioning came from two engineers

Two engineers began to construct air conditioning units that would most closely resemble what we use in modern times.

In 1889, Alfred Wolff designed a ventilation system for Carnegie Hall in New York. He placed a block of ice in the air duct and as the air passed through the block it cooled the air. Wolff's creation was not, however, successful during the highest heat of the summers.

In 1902 his contraption had moved forward and he installed a winter heating system, again in Carnegie Hall. The air conditioning system was a lot more technical than his air duct ice, combining dry and wet bulbs, steam pipe regulators and a temperature control.

Wolff moved on to install a 3000 ton air conditioning system in the New York Stock Exchange, which remained in place for the next 20 years.

The second engineer, Willis Carrier, built his self-titled "apparatus for treating air" for a publishing company in New York, in the same year as Wolff's air duct device. Carrier's assignment was to use his expertise to solve a problem that was occurring in the Brooklyn Printing Plant.

Fluctuation in heat and humidity were causing the dimension of the printing paper to alter and misalign the inks. Carrier installed a system much similarly to Wolff, which blew air over cold coils and through the moisture condenser.

An important difference between Wolff's system and Carrier's, was that Carrier used two sets of cooling coils in his machine as apposed to Wolff.

Carrier took his thoughts on the idea of air conditioning furthers in the field than most of the inventors who had played around with the concepts of air treatment. His greater discovery in history of air conditioning took place in late 1902, while he waited for a train on the platform of Pittsburgh Station.

He noticed the mist and fog surrounding him and realized that he needed to create something like this in his ventilating devices to control and adjust humidity.

Carrier is known as the "Father of air conditioning;" although, the phrase air conditioning originated from a textile engineer, Stuart W. Cramer, who came up with the name when he described his system for regulating the temperature and humidity inside a textile factory in 1905.

Thomas Midgley "Miracle Compound" changed history of air conditioning

Before the time of Carrier and Cramer, Ferdinand Carre of France developed a more complex system in 1859. Until then most of the air treatment machines used air as the main cooling ingredient.

Carre's design contained expanding ammonia. Ammonia liquefies at a much lower temperature than water and is therefore able to absorb more heat.

Ammonia, however, is toxic and this prevented the general use of mechanical refrigerators for household use. Several fatalities occurred during the 1920's from leakage of the ammonia from refrigerators but the combined effort among the three American companies – Frigidaire, General Motors, and DuPont – began to try to eradicate the problem.

This "miracle compound," that changed the history of air conditioning created by Thomas Midgley with the assistant of Charles Franklin Kettering has invented refrigerant in 1928.

Ac refrigerant is not natural but is mass-produced by two companies in the United States. It is made up of chlorofluorocarbons (or CFC's). What Midgley did not know at the time was the effect that these substances would have on the environment.

The negative effects on the ozone layers are well documented today, but during their time it was not known that these harmful CFC's would be released from the refrigerators.

Even though CFC's are safer than ammonia, they cause harm to ozone. As a result the ozone layer has been thinning dramatically year by year.

Around the time of World War I, the beginning of cinemas and movie theaters became the next industry that would discover a need for air conditioning. An engineer named Frederick Wittenmeier manufactured air conditioning systems for Central Park and Riviera Theater.

These units used carbon dioxide as the coolant; however, this gas demanded high-pressure equipment, which tended to suffer from leakage. The positive aspect of using carbon dioxide was that it is

odorless and only becomes toxic in very high concentrations. It is also non-explosive and nonflammable.

Back to Central Air Conditioner and Refrigeration Cycle from History of air conditioning

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Air Conditioning History

Air conditioning history and **history of refrigeration** – Find out who invented the air conditioning.

Who really invented the air conditioning? Is Willis Carrier the father of air conditioner? That question is still debatable, but here is a brief article of air conditioning history.

Some people consider Willis Haviland Carrier to be the "father of air conditioning" or the "father of cool" yet, so many people had already contributed to the invention of air conditioning before his innovations.

He was the first to made the air conditioner units. However, the idea of air conditioning existed before the first residential central air conditioners were even designed.

In the beginning – they understand the principle of refrigeration and air conditioning (cooling)

The basic theory of air conditioning can be obtained from the second law of thermodynamics, which states that heat flows from hot areas to cold, not the other way around.

If its energy is to flow from cold to hot, it needs additional energy. It seems an easy notion, but it still took over a century for basic air conditioning units to manufactured and designed.

Ancient Greeks, Jews and Persians understands this theory and they invented the ideas of air conditioning. They collected natural ice and snow and used it to cool wine, food and delicacies. They used wood or sawdust to insulate the ice and reduce the transfer of heat to stop the

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ice from melting.

Medieval Persians used an intricate building design that used cisterns and wind towers to cool buildings during the hot season. The cisterns were large open pools in courtyards which collected rainwater.

This rainwater then evaporated, causing the air in the courtyards to become cooler. The wind towers were designed with windows that would catch wind and internal vanes that directed the flow of air down into the building.

History of refrigeration begin with...?

Air conditioning units can trace as far as 1748. At Glasgow University William Cullen demonstrated the first design of artificial refrigeration. He used an air pump to create a partial vacuum.

The water inside the evacuated chamber was brought to a boil; in which, the most energetic molecules became vapor. The liquid water's temperature fell rapidly causing it to eventually freeze.

According to sources, Cullen used ether instead of water. Despite the core area of Cullen's concept, his invention was never use.

The history of refrigeration didn't started with William Cullen, Ancient Greeks, Jews or Persians . Some evident indicated that the Chinese understand refrigeration concept and they were the first to used that refrigeration ideas.

Although the Chinese, Ancient Greeks, Jew or Persians understood the ideas; William Cullen, Oliver Evans, and Willis Carrier invented the commercial air conditioner units. They were consider the greatest people in air conditioning history.

Oliver Evans invented vapor compression system

In the late 1700's, Oliver Evans discover air cooling method. Born in 1755 in Delaware, Oliver worked as a wagon maker, and studied math and science.

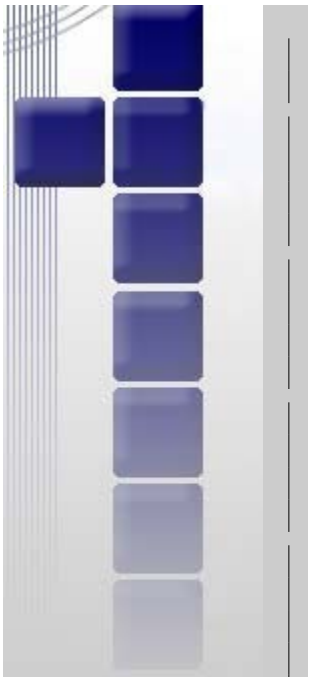
He soon gained a reputation for building all kinds of laborsaving devices, but his attention caught by the latest power source – steam. Oliver set about producing his own energy efficient engine, and by 1804; he had accomplished it.

Evan's Colombian High-pressure Engine was the first step for the American's journey towards a power based industry. Another of Evan's designs was a vapor compression system which included an ac compressor, an ac condenser and a cooling coil, which dramatically altered how air conditioning work and it impact on air conditioning history.

Evans died in 1819 without manufacturing the design, but his friend, Jacob Perkins, followed Evan's lead and built the prototype of a modern air conditioning system.

Air conditioner history greatest doctor

It was almost a century later when an American physician, Doctor John Gorrie, who created a device, that would be the first step to modern



refrigeration and air conditioning. Gorrie was a doctor in charge of the U.S Marine Hospital in Apalachicola, Florida.

He was the first American to make an attempt to cool his hospitals and he created a device that blew air over a bucket of ice, thus creating a cooling breeze. During the 1830's his invention was used for cooling the wards of the patients suffering from malaria and yellow fever.

In 1851, John Gorrie was granted a patent for the first commercialized machine used for refrigeration and air conditioner units. Gorrie's advanced system used a pump to compress air which in turn made the air hot.

He removed the compressed air by circulating it with cold water before allowing it to expand. The expansion cooled the air to a temperature lows enough to freeze water. Gorrie's system is not too different from our Glaswegian professor, William Cullen.

Gorrie hoped to eventually put his ice making machine to use by regulating the temperature of entire buildings. He went so far as to manufacturing a device that would cool down entire cities. Although his prototype did not work without leaking, he was still granted a patent in 1851.

Alexander Twining

Alexander Twining wasn't considers as the father of air conditioning, but his experiment with vapor-compression refrigeration in 1848 contribute greatly to air conditioning history.

He obtained patents in 1850 and 1853 for his contribution. He is credited with having started commercial refrigeration in the United States by 1856.

Twining graduated from Yale in 1820, and became a professor of mathematics, civil engineering, and astronomy at Middle bury College from 1839 till 1849. He was employed as a civil engineer on various railways and canals, and discovered the first practical method of producing ice in bulk quantities by artificial means.

Michael Faraday contribution to air conditioning history

A British scientist, Michael Faraday, was originally recruited as a bookbinder at the age of 14. It was during his employment that he became immersed in the chemical works of the current time.

He spent years on scientific work, which dealt mainly with chemicals. He was responsible for liquefying chlorine and some other gases. In 1845, Faraday discovered that intense magnetic fields can take the place of polarized light and this is known today as the Faraday Effect.

Faraday set up a series of experiments, mainly based on electricity. During his work, he discovered that if liquefied ammonia evaporated, the air that it evaporated into would chill.

Michael Faraday is considered by many as the greatest experimentalism whoever lived, and his pioneering experiments and conclusions are commonly used in modern day science.

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Residential air conditioners

So what are residential air conditioners?

Okay, before I explain what it is. I want to clarify the difference between air conditioner units and residential air conditioning, or just a regular air conditioning. So, there won't be any confusion in the term.

An air conditioning is a way to maintain comfort conditions in a home by controlling the temperature, air movement, cleaning, and humidity or dehumidify for your comfort. Don't confuse this with the actual device (air conditioner units).

Air conditioner units or central air units is just a system, apparatus, or an energy converted machine that is designed to convert electrical

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TEMPSTAR HVAC
SEARS AC
RUUD AC
AMANA HVAC
GIBSON HVAC
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ARMSTRONG HVAC
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energy to mechanical energy.

It also transfers heat from one location to another by using a refrigerant as a substance for heating or cooling.

How does air conditioning work?

Home air conditioning units work by removing heat from one location and rejected to another.

Air conditioner units come in different types of brand name, size, Ac Freon and purpose. However, all of it has five basic components, air conditioning theory and operation principle.

These basic components are: air conditioner compressors, condenser, expansion device, evaporator coils, and the piping that connects these components.

When all components are connected properly the refrigeration process becomes a cycle. This is known as refrigeration cycle.

During this cycle there is no beginning or ending point, but an HVAC (heating, ventilating, and air conditioning) technician generally started the refrigeration cycle at the air conditioner compressors, since it's the heart of the air conditioner units. A substance called Air conditioner refrigerant (you might known it as Ac Freon) is introduced into the Ac units.

Air conditioner refrigerant absorbs heat in one area and transfer within the air conditioning coil. All these components must operate in harmony. Air conditioner compressors can pump no more vapor ac Freon than the evaporator coils can provide.

The air conditioner condenser cannot condense anymore vapor to liquid than the medium (surround air) which can absorb its' heat. The meter devices cannot allow more liquid Air conditioner refrigerant to flow through the evaporator coil. Than, the evaporator can boil it to vapor before it goes back to the ac hvac compressor.

If it's not in harmony with each other, you will find problem within the residential air conditioner. This problem will be discussed in the residential air conditioning troubleshooting section.

Types of Residential air conditioner unit

There is a minimum of six types of home air conditioner or more.

Central ac units	Portable ac units	Window ac units
Geothermal units	Ductless air conditioner	Residential heat pumps

return from residential air conditioners to central air conditioner and refrigeration

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Central Air Conditioner Prices -- How Much Does Central Air Cost?

How much does a central air cost?

The average central air conditioner prices on a 13 seer rating and 3.5 ton are $2,643. The average came from five different brands. $2,643 does not include the furnace unit.

As of January 2006, 13 seer rating is the minimum ac seer accepted in the Unite State. If you're planning to buy air conditioners with higher seer rating and more ton the hvac price will be higher than this.

Read what other have said and express your opinion

How Much Does your Central Air Conditioner Cost?

Central ac units with 5 tons and 18 seer rating would cost about 3 to 5 grand or even more. This is just air conditioner units. It does not include the heating units.

The central air conditioner prices below are my estimation from five different brands. Take it as my opinion not as facts. I didn't list the brand's name because of so many reasons.

Brand Name	Air Conditioner Ton	Seer Rating	Central Air Cost
	3.5	13	$2,650.00
	3.5	13	$2,502.00
	3.5	13	$2,768.00
	3.5	13	$2,650.00
	3.5	13	$2,645.00

How much does it cost to install central air conditioner unit?

The price to install central air conditioner units with heating unit is between $2,000 and $15,000. The hvac installation costs are estimation, you probably pay more or less depending on location and labor rates.

Central air conditioner price without duct work

To replace central air units and furnace unit without distribution system is between $2,000 and $10,000.

If you paid hvac contractor $5,700.00 to replace central air conditioner units with furnace I would said that good deal.

Central air cost with duct work

Sears Ac
Ruud Ac
Amana Hvac
Gibson Hvac
American Standard
Janitrol Ac
Armstrong Hvac
Discussion
Ac Question
Central Air Cost
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Ac Smells Forum
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To install central air conditioner units with duct work is between $10,000 and $15,000 or more. There are some areas that will charge less.

What determine central air conditioner prices?

There are factors that determined how cheap or expensive the central air conditioner units are. If you're planning to buy air conditioners it is important to know these factors:

1. Warranty
2. Air conditioner brands
3. Air conditioning efficiency
4. Central air conditioner size (basis on sq ft of house)

Warranty

Central air conditioner unit with 10 years warranty is more expensive than a central ac unit with 5 year warranty. Some central air conditioner units will have 5 year warranty on parts and other will have 10 years warranty on the air conditioner compressors.

Air conditioner brands

The brands name does determine how high or low the central air conditioner prices are. There are ac brand out there that is more expensive.

This what you need to consider, what is the difference between brand? Some air conditioner companies market their central air units under different trade name.

Carrier air conditioner owns Payne and Tempstar. The company markets their central air unit under these brand names. Rheem and Ruud are similar ac units and its market under different brand.

Goodman markets their air conditioner units under the brand name GmC, Goodman, Janitrol and Amana. What the difference in major components? Not a lot.

Air conditioning efficiency

13 seer rating is the least efficiency central air units that could install in the United State. If you prefer higher energy efficient air conditioners you have to pay more. Central air conditioner units with 18 or 19 seer ratings will cost more.

Central air conditioner size

The air conditioner ton is estimate from the size of the house. For example, if you have 2,500 sq ft house, you be look at 4 tons ac unit (don't quote me on that). You'll pay hvac contractor more with a bigger house. The central air conditioner prices on a 4 tons central air unit are more expensive than 1.5 ton ac units.

What is the best brand for central air conditioner units?

The most important task homeowners should be concerning with is selecting contractor. It does not matter if you had the top brand air

conditioner unit or bought the best central air conditioner with higher seer rating.

It all comes down to contractor. The efficiency of the central air unit is determined from the installation of the central air units. If the installation is poorly done, you might as well have the least efficiency air conditioner units.

If you had done your homework and you pick the best hvac contractor, let's the contractor selects the best brand. He is the person that will be installing the central air conditioner units.

Why the installation costs and central air cost are so expensive?

The prices to install central air conditioner units are expensive to homeowners. Some people complaint hvac contractor ripping them off or scam. Yes, there are scams out there, but not the contractor that has been in business for 5 or 10 years.

This is the basic guideline contractor follow to install central air conditioner unit. From this basic guideline, you'll understand why it's expensive to install central air conditioner units.

Basic contractor installation's guidelines:

Permit	Central air conditioner prices	Labor cost	Material cost
Subcontractor cost	Distribution cost	The material need	

Permit

You need permit to install central air conditioner units and afterward a person has to inspect the ac units. This is the only way to find out if the central air units have pass local code. Getting permit cost money. Some cities charge different price for permits.

Subcontractor

Hvac contractor has license to install central air conditioner units. Some does not have electrical license, so he has to hire electrician to power central air units.

Central air cost

The average central air conditioner prices to buy minimum seer rating (13 seers) central air conditioner unit is $2,643. Imagine having to buy 20 seers central ac unit with 5 ton. You probably are look at 4 or 5 grand or even more.

Labor cost

Installing central air conditioner unit is not one man job. You need 2 or 3 people to install it. It costs contractor money to hire hvac technician to work for him.

Material cost

The material cost would be the nitrogen, insulator, recovering

machine, tanks, ac Freon and so many others. Air conditioner refrigerant is the most troublesome substance. It's illegal to release air conditioner Freon, so after using all the ac Freon.

The remaining small amount of refrigerant gas has to be recovers and pull the refrigerant tank in deep vacuum. After the tank is on deep vacuum, the contractor pays other manufactory to demolish the refrigerant tanks.

It costs hvac contractor money to buy air conditioner refrigerant, but it also cost money to demolish the deep vacuum tank.

Distribution cost

Some hvac contract has a duct shop and other have to hire subcontractor to put the duct system together. Installing new duct system increase central air conditioner prices in thousand or more.

The material need

This is the tool needed to install central air conditioner units. The hvac tools are not cheap. Once it damages, it's expensive to buy. Hvac tool costs in hundred or even thousand of dollar. Most hvac tools require license to buy it.

I hope these basic guidelines explain why it's expensive to installing central air conditioner. Installing central air conditioning units are not easy for contractor. Everything, he installs has to follow local code and is safe for homeowners.

Every contractor tries to finish their installation as short as possible. Contractor loses money by working on the job longer or going back to the central air conditioner units. That why some contractor made sure their installation is prefect and the homeowners are satisfy.

What Is The Cost To Replace Your Central Air Conditioner Units?

How much did it cost to put heating and central air conditioner units in your home? What the central air conditioner prices range in your area? Share it with us!

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Tell Us How Much It Cost To Install Your Central Air Units? [?]

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Your story will appear on a Web page exactly the way you enter it here. You can wrap a word in square brackets to make it appear bold. For example [my story] would show as **my story** on the Web page containing your story.

TIP: Since most people scan Web pages, include your best thoughts in your first paragraph.

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Click here to upload more images (optional)

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What Other Visitors Have Said

Click below to see some prices range for central air conditioner units and heating units in your area.

Replacement 18.2SEER AC-Heat Pump, coil, blower,thermostat $13k

★★★★★

$12,933 for top of the line Carrier 18.2 SEER Puron AC - Heat pump. Installed Oct. 2009.

This Hvac unit replaced a 15 year old central ac unit that ...

★★★★★

Mobile Central Ac In Alabama

The cost of the central ac unit and install it was $7300. With no duct work included. The duct work was there. It is a Rheem 16 seer heating and central ...

★★★★★

Can you give an estimated cost for this size house?

We just moved into a 1950 square foot home and have a Carrier furnace that was installed about 3-5 years ago as well as the duct work. We are over 65 ...

★★★★★

Raleigh NC AC/Heat Pump replace

We replaced the outdoor ac and the indoor furnace for about $4,800 about 1.5 years ago. We got it done with Service Experts. We got a Lennox 2 ton 13 ...

My Central Air Conditioner Cost
The central air conditioner cost us exactly 6, 000 dollar. We have a payment plan with the contractor.

We had the contractor replace the outside unit ...

HELP I'VE BEEN ROBBED
Just needing to know how much is it to get a replacement AC system since my 3.5 ton was stolen. I do not have a picture to load. Just want air conditioner....

Our central air conditioner cost $7,000 in NC
My neighbor replaces his 15 years central air conditioner units. He said compressor fails before winter. They were luck it didn't die on summer.

The ...

Hvac guys replace my air conditioner for 900 dollar!
I somehow could only upload one picture and I upload the outside system.

I had my old carrier central air conditioner replaced with new carrier central ...

Amana 18 SEER for $8,100! Not rated yet
I recently purchased a high efficiency two stage heat pump, TXV, 1600cfm blower and ComfortNet thermostat for $8,100.

It also included replacing 50%...

Carrier 3 ton "package" pump with digital thermostat Not rated yet
I got a 14.5 seer 3 ton installed for $4990. The best part is that I will get $1497 back for an energy efficiency model.I financed through our power company,...

Amana 2.5 ton 13 Seer Heat Pump Not rated yet
I had a complete system installed in 2004. It comes with central ac unit, furnace, air ducts and had two additional ducts added to the garage.

This ...

Installed central air conditioner in our vacation home Not rated yet
I bought a 5 ton, 15 seer rating central air conditioner about a year ago and kept my old furnace unit (one year old). The central air conditioner units ...

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How Does a Central Air Conditioner or Central AC Units Works?

What is a central ac unit?

Central air conditioner units are energy moving or converted machines that are designed to cool or heat the entire house. It does not create heat or cool. It just removes heat from one area, where it is undesirable, to an area where it is less significant or makes no difference.

Central air conditions has a centralize duct system. The duct system (air distribution system) has an air handler, air supply system, air return duct and the grilles and register that circulates warm air from a furnace or cooled air from central air conditioning units to our room. It returns that air back to the system and starts again.

It uses Ac refrigerant (you may know it as Freon) as a substance to absorb the heat from indoor evaporator coils and rejects that heat to outdoor condenser coils or vice versa.

Central air conditioning units used a blown, which is mounted indoor to a furnace to circular that cold air to the entire house through air distribution system (duct). It uses the same duct system for heating and cooling.

How does air conditioning work?

Home air conditioning units work by removing heat from one location and rejected to different location.

Central air conditioner units using the compressor, the condenser fans, the blower and the air conditioner unit's electrical parts to make the ac units work. Central ac units work by using an electrical energy and converted it to mechanical energy.

To have an idea of how central air conditioning unit works. We have to understand the basic five mechanical components and how the basic

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Bryant Hvac
Lennox Ac
Rheem Ac
Heil Hvac
Tempstar Hvac
Sears Ac
Ruud Ac
Amana Hvac
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American Standard
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Armstrong Hvac
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Central Air Cost
Hvac Problems
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Ac Ice Discuss It

refrigeration cycle work.

1. The air conditioner compressors, located outdoor within the condenser unit is responsible for providing the pressure difference in an air conditioner system.

   The compressor pulls in low-pressure, temperature from the evaporator and compresses that gas to high-pressure, high temperature superheats to the condenser.

2. Air conditioner condenser, it's a square (or round) metal box located outdoor. It receives the high-pressure, temperature vapor refrigerant from the compressor and rejects that heat to the surrounding air (medium).

   As a result of condensing the hot vapor heat, the refrigerant turns to liquid.

3. The air conditioner evaporator, located indoor within the air handler or furnace is responsible for absorbing heat from whatever places that needs to be cool.

4. Air Conditioner Refrigerant copper tube- Its copper tube that connects the compressor, the condenser, the metering device, and the evaporator.

   Once the refrigerant's tube connects to these components, and we add refrigerant in it; It is now known as refrigeration cycle (close- loop air conditioner units).

   This tube comes in many differences sizes, purpose and some of it comes with an insulator.

5. The air conditioner expansion valve (meter devices) is located indoor in the air handler or furnace.

   The meter devices are near the evaporator coil which is within the air handler. It acts as a restriction. It's responsible for providing the correct amount of refrigerant to the evaporator coil.

The Operation Principle:

Central air conditioner unit is simply a matter of removing heat from indoor (evaporator coil) to outdoor (condenser unit) by using the four basic mechanical components:

The compressor, the condenser, the expansion device, the evaporator and the refrigerant copper tube that connects these components.

If we understand how the basic refrigeration cycle works, we understand how any air conditioner units work. Since all air conditioner units have the same basic components, refrigeration cycle and air conditioning theory.

It doesn't matter if it's window ac, packed air conditioner, ductless air conditioner, portable air conditioners or central air conditioning units.

"The basic operation is always the same!"

The only difference is: brand name (Goodman, Trane, Carrier, York, and Amana), capacity rating of refrigeration equipment (air conditioner's size), seasonal energy efficiency ratio (SEER), prices, different types of refrigerant it uses, and other factors.

How central air conditioning unit work video

Make sure to press the Play button in the player controls to watch it. Enjoy!

Let's understand basic residential air conditioner terms

1. Central air units- it clears the air, dehumidifies, and lowers the temperature. How does it do that? Let's imagine we have an air that is72°F passed through the air conditioner filters, then through the 40°F evaporator coils.

   First, it clears the air, next it lowers the temperature from 72°F to about 58°F (heat will always transfer from high to low) then it dehumidifies the air (evaporator condensing the air). This is knows as central air unit process.

2. The refrigeration cycle is cycle within close-loop Ac units. To determine what is happening to the refrigerant within the compressor, the condenser, metering device, and the evaporator, we use a gauge to find out the subcooled, superheat, temperature, and pressure.

3. Ac Btu (British thermal units) - The amount (heat quantity) of heat needed to change the temperature of 1 lb of water to 1°F. It's the system of measurements we used in U.S. to determine the quantity of heat.

4. Heating Seasonal Performance Factor (HSPF) – It's heat pump's energy efficiency rate in Btu on during heating season.

   This shows us the total heating output (supply heat) in Btu (including electric heat) during heating season and compared to the total electricity energy heat pump consumed (in watt/hr) in the same season and you get HSPF.

5. Ton of refrigeration (cooling) – It measures the amount of heat transfers. One ton air conditioner units will remove 288, 000 Btu/24 hrs or 12, 000 Btu/hrs.

6. Energy Efficiency Rate (EER) – cooling capacity of room air conditioner units (in Btu/hr) divided by electrical energy (in watts/hrs)

Central air conditioner ratings

Residential air conditioner is rated in Seasonal Energy Efficiency Ratio (SEER) – It is the measurement of central air conditioner

units or heat pump efficiency rate in Btu over cooling season.

It's the total cooling output (supply air) of an air conditioning Btu you get out during its normal usage periods (approximately 4 months) and then divided to electricity energy the central air conditioners consumed (watt/hr) in that same cooling season and you get SEER.

Why do you size central air conditioners and how?

The reason HVAC contractor does this is to find the correct size air conditioner units (measure in ton) you need for a replacement central air units or for a new house.

Some HVAC contractor size air conditioners by the rules of thumb (guesstimate) over the phone, which is fine. Not every contractor has the luxury to attend every home to provide estimation, but the finish sizing should be done properly on paper.

If an HVAC contractor does not have a properly load calculation you either have an oversized or undersized equipment.

To determine the proper size of central AC units you need to have the Manual J and Manual D books by Air Conditioning Contractors of America.

You could use HVAC load calculation software to determine heat gain (air conditioner units) and heat loss (furnace). I will go into more depth on this!

Types of central air conditioner units

There are whole bunch of different types and form of central air conditioning units, but in a residential air conditioner there are two types of central air conditioner units you will see: a split system air conditioning and package air conditioner units.

Split system air conditioning

Split - system have the two separate metal cabinets for indoor and outdoor. These two cabinets are connected to each to other with copper refrigerant tube.

Indoor units, which are also known as air handler. It contains the blower, furnace (for heat season), metering device, evaporator coils, control, and other electrical parts.

The condenser is located outdoor, it has a square or round shaped metal cabinets containing a compressor, condenser fans, and condenser coil plus the electrical parts.

In a split-central air conditioner unit or any air conditioner units the major components must be compatible. Each major component must have the same capacity rate, if an indoor unit is 13 SEER the outside units also have to be 13 SEER.

Make sure to have manufacture equipment specification sheets, it tells you the component's capacity and what the equipment is designed for. If you do not know the information, find out the

brand name and called the manufacture.

Split Central Air Conditioner Video

Make sure to press the Play button in the player controls to watch it. Enjoy!

HVAC Training Videos made by alpinehomeair

Package air conditioner units

Package unit is a self-contained air conditioner units, which have all the components built into one metal cabinet. Package air conditioners are normally located beside the building, on top of roof or on a window.

Window air conditioning is a package air conditioner, except its small, has less capacity, and it has the one fan motor with a double shaft that runs the blower and condenser fan.

While larger package air conditioner units have a 200 ton of air conditioning or heating capacity with two motors fan. One fan is for evaporator and the other for condenser.

A rooftop unit in light commercial is normally air-to-air or air cooled air conditioner units. It's on top of the building just to save building space.

Even though package air conditioner unit is located outside or on top of the roof, it needs an air distribution system, control connection and must be connected to a power line by a licensed electrician.

Except window units, it does not need a duct system it just blows air freely to open space.

There are different types or arrangement of package air conditioner systems.

Here are a few:

1. Air-to-air package unit
2. Air-to-water package unit
3. Water-to-water package unit
4. Water-to-air unit

Air-to-air package unit or air cooled package unit is similar to window air conditioner except it has an air distribution system and two motor fans.

The term air-to-air means that it uses air as the condensing medium, it absorbs heat from the inside air and rejects it into outside air or vice versa. Air-to-air package system is the most common system used in residential and light commercial.

Air-to-water sometimes known as water cooled package unit, absorbs the heat out of conditioned space air and rejects that

heat into water.

This water could be waste, reused, or go through a cooling tower to reject the heat to surrounding (ambient) air.

Package Air Conditioners Video

HVAC Training Videos made by alpinehomeair

Make sure to press the Play button in the player controls to watch it. Enjoy!

Here is another Package air conditioner unit video

HVAC Training Videos made by DrZarkloff

Return to central-air-conditioner-and-refrigeration-cycle from how central air conditioner work

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What is Air Conditioner Condenser?

Types of air conditioner condenser

AC condenser units are grouped according to how it rejects the heat to the medium (surround air). Here are a few condensers units.

- Air cooled condenser
- Earth cooled condenser (Geothermal Heat Pumps)
- Water cooled condenser

- Combination of air and water cooled condenser (Evaporative condensers)

Air cooled condensers are mostly used in residential air conditioner units and commercial air conditioning unit.

The Air Cooled Condenser

The air conditioner parts that are located beside residential are an air cooled condenser.

Air cooled condenser use outdoor air as a place to reject the heat absorbs by the air conditioner units. The condenser also has parts that help with heat reject.

Here are some of the condenser parts:

- Condenser fan blade
- Condenser motor
- Condenser coils
- Air conditioner compressor is within the condenser unit, but it does not help with heat rejection!

The condenser fan is mounted with the air cooled condenser. The condenser fan primary purpose is to increase condenser unit's capacity to reject heat.

Air cooled condenser come into two types:

- Fin and tube condensers
- Plate condensers

The Water Cooled Condensers

The water cooled condensers reject the heat absorbs by air conditioner system to the water. The water has to be clean, noncorrosive, and at certain temperature. This water has to be treating to prevent pitting corrosive, algae, scale, chalky, and mineral deposits.

Even though, water cooled condenser require regular maintenance, it is more efficient than air cooled condenser, and it operates at much lower condensing temperature.

Types of water cooled condensers:

- Tube in tube
- Shell and coil
- Shell and tube

What are air conditioner condensers?

Air conditioner condensers are a heat exchanger device; it has a similar operation principle to the evaporator.

The condenser rejects heat from the air conditioner units to surrounding air (medium). While the evaporator absorbed heat from space that needs to be cool. In our case, it is from indoor air.

The condenser units take in high-pressure, high temperature refrigerant gas from the compressor and turn it into high-pressure, high temperature liquid refrigerant. How does an ac condenser change refrigerant gas to liquid refrigerant? Here how it does that.

Air conditioner condensing unit work by turning vapor refrigerant to liquid refrigerant. There are three important steps that should happen to the refrigerant as it passes through the condensing unit.

First Step: The hot vapor coming from the compressor must be de-superheated to the vapor saturation point. De-superheated? De-superheated is removing a sensible heat from the refrigerant, lower the refrigerant temperature.

Second Step: In the middle of the condenser, there should is mixture of gas/liquid refrigerant. This is where the refrigerant vapor should change to 100 percent liquid refrigerant.

Third Step: The refrigerant temperature should be lowered below the liquid saturation point, subcooled.

How does air conditioner condensers make?

Here is Trane condensing unit video:

Make sure to press the Play button in the player controls to watch it. Enjoy!

How air conditioner condensing unit work

Refrigeration is the process of removing heat from one area, where it is not wanted, to an area where it not makes a difference. For the refrigeration process to work heat has to flow from one area to another.

Here is a step to how heat will be transfer from AC evaporator coils to AC condensing unit.

1. Indoor heat transfer to refrigerant in evaporator coils
2. Compressor move heat to condenser units
3. Air conditioner condenser rejects heat and the process start again

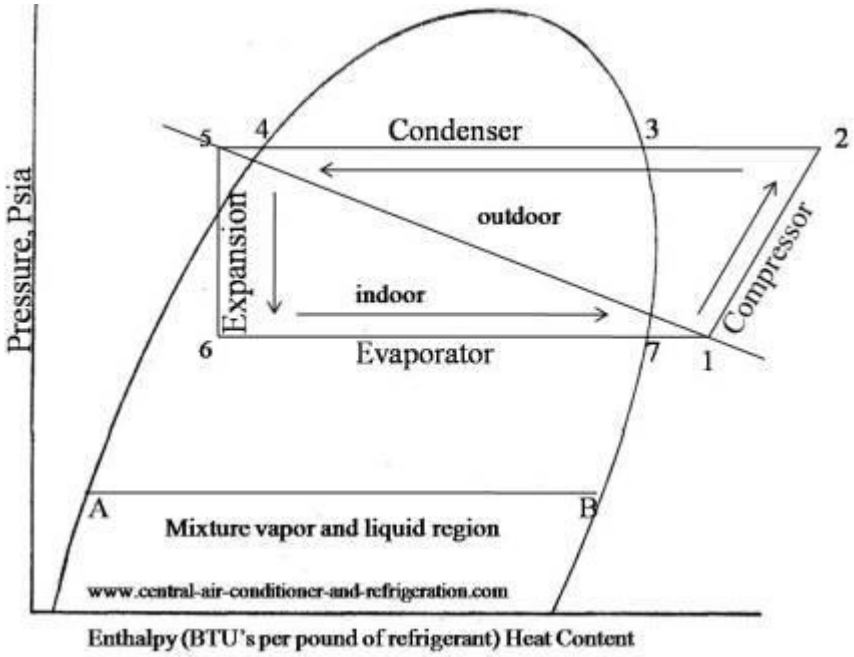
In this discussion, the air conditioner condensers will transfer heat to air (not water). For heat to flow one of the area has to be at a higher temperature. This is because heat always flows from a high intensity to a low intensity.

The air conditioner condensers reject heat from the refrigeration system absorbed at the evaporator and also heat of compression from the compressor. The condenser contains refrigerant that must reject

its heat to the outside medium (air that surrounds the condenser). Therefore, the refrigerant temperature in the condenser units must be higher than the surrounding air.

I will explain how air conditioner condensing unit work from PH charts.

The condenser units receive the hot vapor refrigerant after it leaves the compressor through the short refrigeration line between the compressor and the condenser unit. This refrigerant line has known as the hot gas line or discharge line.



Point 2 on the pH diagram showed the hot vapor from the compressor is forced into the top of the condenser coils. The vapor refrigerant is being pushed at high speed and high temperature to the condenser units.

The vapor does not corresponding to the saturation pressure/temperature relationship because the vapor contains superheat added by the evaporator and the heat of compression process. This process is shown between points 2 to 3.

The vapor entering the condenser is so hot compared to the surrounding air that a heat exchange begins to occur immediately after the vapor leaves the discharge area of the compressor. Generally, the air will be 90-105°F lower than the superheated vapor leaving the compressor.

The first heat exchange removes sensible heat from the superheated vapor bringing the refrigerant vapor to the saturation point, point 2 to 3 on the pH chart.

As the refrigerant vapor continues through the condenser latent heat is

removed. This process is shown between points 3 and 4. The removal of latent heat causes a change of state to take place.

The vapor will begins to change to liquid from this point on until it reaches a point nears the end of the condenser units where the entire vapor has changed to liquid. This is known as the saturated liquid point, point 4 on the pH chart.

As the air conditioner refrigerant flows through the last few rows of the condenser units additional sensible heat is removed, lowering the refrigerant temperature below its liquid saturation point. This called subcooling and represented by the line from point 4 to 5 on the pH chart.

There must be enough air flowing across the AC condenser, for vapor refrigerant to change to liquid. The air flowing across the condenser unit has to be correct. This airflow has to be at low enough temperature, so it could absorb heat from the condenser unit.

The entire vapor refrigerant has to turn liquid before it leaves the condenser units.

Remember, the air conditioner condensers:

1. Removing sensible heat (de-superheated).
2. Removing latent heat or condense.
3. Removing more sensible heat (subcooled).

This is how air conditioner condensers work in HVAC units.

Read other **central air conditioner parts**

Air Conditioner Compressors

Air Conditioner expansion valve

Air Conditioner evaporator

Return from air conditioner condenser to central-air-conditioner-and-refrigeration

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How Central Air Conditioner Works

HOME

CENTRAL AC BLOG

HOW AC WORKS

AC MAINTENANCE

TECH TIPS

YOUR Reviews

TRANE AC

CARRIER HVAC

Central Air Conditioner Cover Protection for condenser unit

Central air conditioner cover

I had seen this on some homeowner's condenser units and I'm going to discuss the advantage and disadvantage to having a central air conditioner cover.

They should call it condenser units cover; instead, air conditioner cover.

By the way, the air conditioning covers are not meant for Heat Pump. Heat Pump needs the condenser unit for winter season.

Should I cover my central ac unit?

Goodman Ac
York Hvac
Bryant Hvac
Lennox Ac
Rheem Ac
Heil Hvac
Tempstar Hvac
Sears Ac
Ruud Ac
Amana Hvac
Gibson Hvac
American Standard
Janitrol Ac
Armstrong Hvac
Discussion
Ac Question
Central Air Cost
Hvac Problems
Ac Smells Forum
Ac Ice Discuss It

This is what you're trying to protect with a cover

This is quite hard to answers; the condensers are designed to withstand all kind of weather. Except to your dog's urine, we will discuss that late on.

Condenser unit is a component that is high pressure and temperature in a regular central air conditioner unit. It means no common weather would hurt it. Perhaps a 5 pound hail may bend the guard and damage the fins. (By the way, I hadn't see 5 pound hail yet!)

Some air conditioning brands does not recommend covering your central air conditioning units. However, Trane sells ac cover for the outdoor units.

The only part that needs protection is the aluminum coil. That is one of the reasons central air conditioner cover is useful for. It prevents dust, seeds, grass, foliage and other foreign material from clogged the aluminum fins. It is a protection for the aluminum coil from small particle. That is it.

Advantage to air conditioning cover

Yes, it good ideas to have a central air conditioning cover. Here why, central air conditioner units operated on the ideas of heat transfer.

Condenser coil is a heat exchanger that transfers heat to the surrounding air. If the condenser coil is dirty, it acts as an insulator.

It reduces the efficiency of the central air conditioner units by having dirty condenser coil or the evaporator coils.

The condenser unit does not need the cover; it's the coils that need

protection.

Having air conditioning cover reduces the amount of dirt or debris from clogging the aluminum fins. This is return save you money. This does not mean your condenser unit does not need check up by technician.

Central air conditioner cover is like two-edged sword. If you use the wrong material to cover the condenser unit, it will hurt the condenser in long term. If you have the correct material for the cover it'll help.

Will air conditioner cover stop copper thieves?

No, it'll not stop thieve from stealing the copper. Someone ask this question and I was trying so hard not to laugh.

Empty rental house or for sale house is primary target for thieves. They will steal the entire condenser unit or just the copper.

Male dog and condenser unit

A lot of homeowner does not realize that a dog's urine wills destroy the aluminum fines. I'm not sure if an air conditioning covers will be useful against dog's urine. You need to find that out from cover's manufacture.

Dog's urine reacts with the aluminum fin and you will see a crumble and corrosive surrounding the urine's area. If you were to run central ac unit with collapse fins, it'll consume a lot of energy.

No, you can't just replace the corrosive aluminum! You will have to replace the entire condenser unit. This could cause thousand of dollar in part and labor.

The best solution is to have chain link fence surround the condenser unit. The chain link fence height should be few inches higher than the dog height. It's best to have a moveable fence, instead the permanent one.

If you have a dog and you don't protect your condenser unit. This is what it will look like, if a dog were to piss on it.

Here is another condenser unit cause by dog urine.

Here damage dog's urine cause to coils video

Disadvantage to central air conditioner cover

The bigger problem with air conditioner cover is moisture. If you were to cover the condenser unit from top to bottom, moisture could trap within the condenser unit and it will lead to rust.

The aluminum fins may not rust, but the electrical parts within the

condenser unit will.

Some company designed a special material to prevent moisture from building inside the cover. All the cover manufacture seems to claim they have special material for the cover. You will have to find that out.

By have central air conditioner cover; you also created a warm environment within the condenser unit. Since, I'm not an expert on insect. I wouldn't know what types of insect would attract to warm environment. It could be anything.

If you decided to have cover for your condenser unit, make sure to buy the air conditioning covers with vent in it. It also good ideas to check the air conditioning covers monthly to make sure there is no insect or animal living in it.

Having air conditioner cover does not mean your condenser unit does not require maintenance. It meant you could reduce the cost of maintenance.

In my honor opinion, the only protection the condenser unit need is from your dog. You can't call your home insurance and said "my dog pisses on my outside unit and I need you guy to pay for it." It wouldn't works. If it was damage by storm or tree, they may pay for it. But not from dog pisses. (Correct if I'm wrong on this.)

Return to central air conditioner and refrigeration cycle from central air conditioner cover

Central Air Conditioning Maintenance

Regular Ac Maintenance = Longer Last Central Ac

Central air conditioning maintenance

The difference between a central air conditioner unit that last 9 or 15 is maintenance.

Regular maintenance is requirement for every central air conditioner. This is not a need, it's a much. Let's said you bought 20 Seer central air conditioning units and you didn't maintenance it. What do you have? Short life span central ac units!

Here are lists of central air conditioning maintenance every homeowners need to do or pay technician to perform. This is just the basic lists; nothing advance.

Indoor Unit

Indoor Blower

The indoor blower delivers the cool air throughout the house. Its good ideas that you clean the wheel, oil the motor or make sure it rotates in the right direction and have the correct speed.

The indoor blower is designed to deliver about 400 cfm per ton of cooling air throughout the house.

How do you determine the air flow? In commercial build we use flowhood. In residential, velometer is the ideal tool to check for air velocity.

Some older model of central air conditioner units tends to have fan belt for the indoor blower. So, inspect it and if the belt is tore or loss, you have to get it replaces.

Over a period of time, the indoor blower blade will becoming dirty and the motor will wear out. This is normal. You could extent it life span by cleaning the blade (wheel) or oil the motor if require.

You also help with your electricity bill by cleaning the blade. Why? The blower consumes energy to move the air and air has weight and is resistance to movement.

It's the wheel cause the air to move. It would help the blower or the fan efficiently by cleaning the blade and the motor. Make sure to check for crack in the blower (house).

If you hear metal to metal sound from your indoor blower, it could means the wheel is looses and it's not screw tight to the motor shaft or screw could felt off from the blower house.

If you're comfortable with electricity (high voltage, low voltage), then this is a central air conditioning maintenance you could do.

Hvac Ductwork

20 seers central air conditioner units will not operate efficient with leaking ducts. The ductwork is what delivers the hot or cold air to the individual room.

If you have air conditioner duct that is

Amana Hvac
Gibson Hvac
American Standard
Janitrol Ac
Armstrong Hvac
Discussion
Ac Question
Central Air Cost
Hvac Problems
Ac Smells Forum
Ac Ice Discuss It
Ac Noise
Serial And Model
-
Privacy Policy
Site Map

- Bend (not slightly, but badly bend)
- Insulator peel off (metal ductwork)
- Tore off
- Not connective purposely to the plenum or the supply and return vent, you losing cooling or hot air.

You will have to check to see if you hvac ductwork does not do any of the above lists. Make sure the return is not block by desk or any other large objects.

It is really important the hvac ducts does not touch the ground. Mold or mildew could develop from a duct touching the ground. If you don't want to go under the floor of your home, you could always hire technician and ask for the company list of central air conditioning maintenance.

Supply Air Vent

On some older house, it tends to have supply vent on the bottom of the wall and it tends to covers with wall's paint. I don't know why people paint over the vent and block the air flow.

You will have to check for that and clean the supply air vent or replace it if you have to.

In regular three bedrooms and one bathroom house, it will have one supply vent on each room and one return vent for the entire house. You will have to check if the children didn't close the supply vent.

Return Vent

Return vent is where the filter supposed to be in. Over period of month it will always be dirty and it's important that you clean the vent.

If you don't clean it, dust or debris will clogged the air flow path to the evaporator coil. It won't happen over period of 6 month. It really depend on how dirties you house is.

Dirty Air Conditioner Filters

Changing air conditioner filter is the simplest thing central air conditioning maintenance you could do. Well, not everyone does it. The air conditioner filters had a purpose. It's for the central air conditioning unit and for the resident.

By not changing the hvac filters, it affects the entire central air conditioner unit. It consumers more energy and product less cooling result. You will need to replace the air conditioner filter or pay the high price of having the filter collapse inside the return duct.

Clean the Evaporator Coil

In a regular split central ac unit. The evaporator coil is located indoor and it purposes is to absorb heat. If the evaporator coil is dirty, it can't absorb heat.

Central air conditioner unit lose efficiency by having dirty evaporator coils.

The best way to determine if it needs cleaning is by looking at it. It should be near the blower, heat exchanger, expansion device or ac filters.

Condensate Drain Lines and Drain Pan

Old drain pan tend to have small crack, you will have to check for it. Make sure the pan is properly underneath the evaporator coils. Someone tend to accidentally knock it without release.

Most central air conditioner unit use PVC pipe to drain the water from the pan. Overtime the drain line will clog and you'll have to remove the dirty and other object from the drain lines.

Inspect evaporator coil, drain pan and condensate drain lines. Clean as needed.

Central air conditioning maintenance Part 2

Return to Central Air Conditioner and Refrigeration Cycle from Central Air Conditioning Maintenance

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How to change air conditioner filters

Why should you replace your air conditioner filters?

Ok, before I tell you how to change air conditioner filters, I should tell you why you should replace it. Some people need a reason to replace it, which is fine.

According to EPA (Environmental Protection Agency), people spend about 90 percent of their time indoor! Not only that, indoor air quality is more polluting then outdoor air!!

We have children spend most of their time indoor playing video game, reading books, playing with their pets.etc.

Nowadays, we have all kinds of chemical that is within the indoor air we breathe; the danger chemical cause health problem for young children, older people and pregnant women.

We could reduce indoor air pollutes to small fraction by known how to change air conditioner filters and known how to choose which air conditioning filters are right for our home.

There are other reasons you should change your air conditioning filter: energy, money! Yes, you save money, and energy by simply replace an air conditioner filter.

There one service called, I dislike the most! I receive a call from homeowner tells me that their central air conditioning units are running, but it not cooling and there is ice in the suction line (big insulation line outside).

I always ask them, "Do you replace your air conditioner filters?" And some homeowner does not know what air conditioning filters or how to change air conditioner filters. This is bad for their wallets.

Air conditioner units are expensive luxury equipment. AC units should have a regular maintenance. It will save energy and the AC units will last longer in the long term.

Replacing the air conditioner unit filters are maintenance everyone could perform. If you do not know how, I will show you how to replace AC filters.

How to change air conditioner filters

Replacing air conditioner filters on a monthly base (some home may vary) are the best way to improve evaporator efficiency and the operation of the entire air conditioner units.

In regular central air conditioner units, evaporator is the components, which absorb heat from indoor and the ac condenser unit rejects heat outdoor.

If evaporator coils are dirty, the dust act as an insulator, it prevents the evaporator from absorb the number of heats it capable of.

A home air conditioner system with dirty air filters or without air filter run for long period will have the same effect to evaporator.

Dirty air conditioner filters will also damage the air conditioner compressors and the blower might pull in the entire air filters into the air conditioning duct. It will cause a major problem to homeowner if ac filters have not been replaced.

Here *how to replace air conditioner filters:*

1. Find the air conditioner filters. So, where? In an air conditioner system, there is supply air and return air.

Gibson Hvac
American Standard
Janitrol Ac
Armstrong Hvac
Discussion
Ac Question
Central Air Cost
Hvac Problems
Ac Smells Forum
Ac Ice Discuss It
Ac Noise
Serial and Model
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The air conditioner filter always in the return air duct. The return air is where it pulls in the air from inside the house.

Put a paper or your hand against the strip metal cover, you should feel it pulling in the air. Try to look inside it with a flashlight to be sure if the air filters are in it. If the air filter is not on the strip metal cover, it is near or within the furnace units.

2. There are 3 places to turn off the air conditioning unit: A switch nears the furnace, thermostat, and power breaker. The reason the power must be off because it's safe, and to prevent the older air conditioner filter dust from getting in the air conditioner unit.
3. Decide the correct air filters size. There should be a number label in the air filter side, it looks something like this: 20x20x1, 8x16x1. If there is no number or there is no air conditioner filter, measure the filter's area and find the air filter closes to the measurement.

   This is an important step in how to change air conditioner filters, if you put the wrong air filters. It will have the same result, as if there are no air conditioning filters.
4. Remove the older air conditioner filters; make sure to take it easy remove the older air conditioner filter. You do not want to accidentally dump older air filters dust in it. Clean dust in the filter area with cloth, paper tower, and dirty object nears by.
5. Choose with air conditioner filters are best for your home. There are air filters that collect dust mites, pollen, tobacco smoke, mold spores or virus.

   The air conditioner filters were originally design to prevent any foreign object from getting inside the fan section and damaging the air the conditioner parts. But now there air filter for everything.
6. Before you put in the new air filter. There should be airflow arrow in air filters frame. This arrow shows which way to put the air conditioner filters. Example. If airflow goes to the right, make sure the air filter arrow point to the right.
7. The air conditioner filters should properly fit in the air filter area. We do not want the air to leak around the air filter frame; we want it to go through the air filters.

   To prevent it from leaking air around the air filter's frame, put tape or cloth between the frame and air filters area to fit properly.

How to change air conditioner filters video

HVAC video made by Howtovideohub

Make sure to press the Play button in the player controls to watch it. Enjoy!

This is how to change air conditioner filters. Remember, Air conditioning units are the expensive appliances in a house and the most energy consumer item. By known how to replace your air conditioner filters: you save money, energy, and health.

How do you remember when to replace air conditioner filters? Here is the best tip to remember. Replace air filter every time you paid the utility bill. If that not specific enough; read how often AC filters filter should be replaced.

Back to Central-Air-Conditioner-and-Refrigeration from How to Change Air Conditioner Filters

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What is air conditioner filters?

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Air Conditioner Filters
It will save you money!
What is air conditioner filters?

The original purpose of an air conditioner filter was to protector indoor air conditioner parts from particles that could damage it. Those were AC filter primary tasks.

Some people are not satisfying with that task, so AC filter manufacture

designed high efficiency air conditioners filters that could catch a particle smaller than the size of your hair. Wow!

Nowadays, there is air filters design specific for your environment need, it comes with a difference brand name (Hunter filters, Trane air filters, 3m Filtrete air filters, Honeywell furnace filters.etc), and MERV (Minimum efficiency reporting value).

MERV is an efficiency ratio to determine the ability of air conditioners filters or furnace filter to capture particle when it passes through the air filters.

The air conditioning filters efficiency values (MERV) are numbering 1 to 16. The MERV efficiency is measure in microns. The higher MERV number, the better the air filters ability to removing particles.

The lowest level supposed to protect the equipment. The middle and higher levels supposed to filter mildew, spores, pollen, and even viruses.

Difference types of air conditioner filters:

What is standard air conditioning filter?

Standard air condition filters designed just to clean the indoor air conditioner parts. It is make of fiberglass or polyester; it has a flat surface area with a cardboard frame.

What are pleated air filters?

Pleated air filters - This type of air conditioning filters has more surface area. The manufactured developed this air filters by folding air filters materials back and forth to provide more surface area.

Pleated air filters are efficient when in compared with media air filter, it is effective at removing particles range from five to ten microns, it also means that pleated air filter can stop pollen in ten microns and up.

What is electrostatic air filters?

Electrostatic air filters designed with polyester and polypropylene materials, it uses filter media that put an electrical charge on all particles as it passes through the air filters. These charged particles are either negative or positive charge. Once these airborne particles are charge, it then attracts to collector layer with the opposite charge.

What creates this static charged is the moving air through the Electrostatic filters. It is a self-generated charged; it does not need electricity. Electrostatic air filter can have built in electrostatic charge.

Electrostatic air filters are different from standard throw way air filter. Electrostatic air filter has layered; it has four or more layer. Depend how the manufacture designed. However, this air filters still going into the same slot as a regular air conditioner filter.

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What is HEPA?

HEPA stand for "high efficiency particulate air", "high efficiency particulate absorbing", "high efficiency particulate arrestance" or "high efficiency particulate air."

HEPA air filters said to remove 99.97 percent of mold, bacteria, pollen with a size of 0.3 microns or micrometres.

HEPA filters not designed for a home air conditioner unit, it is used specific for hospital operating rooms, chemical industry, food industry, portable residential air cleaners.etc.

The HEPA filters developed by United State Atomic Energy Commission (AEC) during World War II for the sole purposed of removing and capture radioactive particulate from escape and harm the surrounding environment. After World War II, HEPA filter was released to commercial and residential uses.

Here is HVAC filters video explaining how to and difference types of AC filters.

Make sure to press the Play button in the player controls to watch it. Enjoy!

HVAC video made by DrZarkloff

What is the difference between furnace air filters and air conditioner filters?

A homeowner asks this question, I might as well put here. There is no difference!

I have not worked on central air conditioner units that have air filters for furnace and difference air filter for an air conditioner system. How could it? The central air conditioning system has one distribution system.

I have seem a central air conditioner system has different air filter for each return duct for that specific distribution system. But not difference air filters for furnace unit and air conditioner units.

There are central air conditioner units that use pre-filter to remove larger particle for high efficiency air conditioner filters.

Some homeowner uses these terms interchangeable. You could refer to air conditioning filters are for summer and furnace filters are for winter. The location of air conditioner filters and furnace air filters are in the same slot.

How to change air conditioning filters

Here How to change air conditioner filters?

This is how to change AC filters. Remember, Air conditioning units are the expensive appliances in a house and the most energy consumer item. By known how to replace your AC filters, you save money, energy, and health.

Purpose of an Air Conditioners Filters

The purpose of HVAC air filters may vary from individual need and want. HVAC air filters original purpose was to keep the indoor system parts from clogged with dusty and other foreign material.

How often should air conditioner filter be replaced?

We already know how to replace air conditioner filter, so how often should we replace it? Some people, HVAC (heat, ventilation, Air Conditioner) contractor, and technician suggests to replace it once a month.

This is the best ideas, if you live by yourself and the house a clean. But this is not good ideas if there is children, pet, and people in and out of the house often. Children tend to bring pollen, dusty, leaves, flower inside the house.

The best way to tell how often to replace air conditioner filters are by looking at it. Yes, I'm sorry if you expected it to be technical, but it not. For example, let said, there is a house occupies by five people, and the air filter start gets dirty every 2 months. Than that how often air conditioners filters should be replaced.

Use your own judgments when to replace it. Some residential air conditioner units need to be replacing every four weeks or twice a month. But each house is different, and you know your own house better.

Back to central-air-conditioner-and-refrigeration from air conditioner filters

Central Air Conditioning Unit | Central Air Conditioner Prices | Air Conditioner Thermostat | Best Central Air Conditioner | Air Conditioning History | Air Conditioner Seer |

The Refrigeration Cycle | Basic Refrigeration Cycle | Air Conditioner Refrigerant | How To Read Ac Manifold Gauge | Air Conditioning Btu | Air Conditioning Efficiency Are Rating In...

Air conditioner parts

Air Conditioner Condenser | Air Conditioner Evaporator |Air Conditioner Expansion Valve | Air Conditioner Compressors

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The Purpose of HVAC filters

What are HVAC filters?

HVAC air filters (Heating, Ventilating, and Air Conditioning) are broad terms to describe difference types of air filters in HVAC field. HVAC terms include heat pump, air conditioner units, furnace unit, geothermal, window units.etc.

HVAC filter is the same as air conditioner filters or furnace filters. Some people use these terms interchangeable.

What the purpose of HVAC air filters?

The purpose of HVAC air filters may vary from individual need and want. HVAC air filters original purpose was to keep the indoor system parts from clogged with dusty and other foreign material.

Indoor AC units, there is evaporator. It is one of the four (compressor, condensers, expansion device) major air conditioner parts. If there was no air conditioner filter or HVAC air filter have not been replaced. This will happen to air conditioner units.

The air conditioner units will lose cooling efficiency, pollute indoor air, and indoor AC units blower consumer more energy. If there no HVAC air filters the blower blade will also fill with dirt and eventually the air conditioning duct system will be damage.

The most painful experience a homeowner will feel is to replace central air conditioner units. Yeah, it will short the life of the air conditioner unit if there is no HVAC air filter or the HVAC air filter has not been replaced.

A homeowner could save a painful wallet experience, by simply replacing air conditioner unit filters. You could say, "The purpose HVAC filters are to help saves money!"

If you're not similar how to replace air conditioner filters read How to change air conditioner filters?

How does a dirty HVAC filter cause air conditioner system to lost efficiency?

The air conditioner evaporator are a device that absorbs heat from indoor; the blower is a device that pulls or pushes the hot air through the evaporator coils.

If the evaporator coils are dirty, the air conditioner system lost efficiency. The evaporator coils are not effective at absorbing heat; because of the dust on evaporator coils prevent it from absorber the correct amount of heat from indoor AC units.

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Air conditioner units will also lose efficient if the AC systems have dirty air filter. It is the same as dirt active as an insulator to the evaporator coils, but this time the dirty HVAC filter active as restriction to the blower.

The air handler blower main purpose was to pull the hot air through the HVAC air filters and push that hot air to the cold evaporator that is what it does. However, it cannot pull enough hot air through the air filter, since the air filter is dirty and the dirty air filter acts as a restriction to the blower.

The air conditioner system does it jobs, but there is not enough airflow to move the cold air from the evaporator. Eventually, the evaporator coils start building ice, and then the air conditioning system will not cool.

The purpose HVAC filters are to allow air conditioner parts work together efficiently as a group. If one air conditioner parts (evaporator coils) are inefficient the entire AC units will run inefficient.

Dirty HVAC air filters have the same result as high efficiency air conditioner filters for the wrong air conditioner units. For example, a homeowner read article on air conditioner filter and he find that really high efficient air conditioner filter can collect contaminant airborne particle than low efficiency air filters and that is true.

What he did not realize that his air conditioner unit cannot endure high efficient air filter. His AC units are not designed for that specific HVAC air filter. As a result, the high efficiency air conditioner filter act as a restriction to his air conditioning system, similar to dirty or no AC air filters.

Although, the original purpose of HVAC filters is to protect indoor air conditioners not to caught micron small particle.

Nowadays, there are many purposes of HVAC filters. There is HVAC air filter for the maximum dust removal. For example, HEPA (High Efficiency Particulate Arrestance) filter is use, mainly for surgical rooms, food processing, pharmaceutical that needs clear air.

HEPA filter can also be use as a pre-filter for higher efficiency AC filters.

Indoor environment pollution

Some HVAC air filter removed bacteria, airborne particle, pollen, contaminate builder material.etc. Other air conditioning filters did much more to ensure healthy indoor air.

Indoor environment will pollute and it will cause air conditioner system failure, health problem if the HVAC air filters have not been replacing on a regular base.

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Air Conditioner Expansion Valve

the Fourth Component

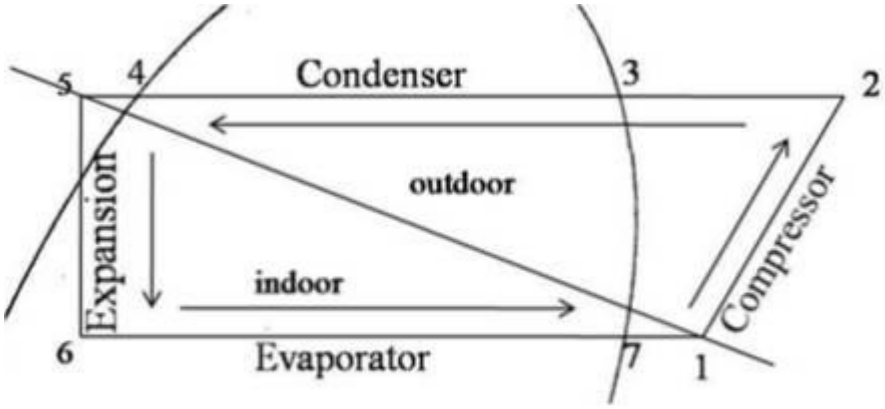
What is air conditioner expansion valve?

The expansion device is the fourth major component in air conditioner units. It's also known as meter devices.

Air conditioner expansion valve is the divided point between the low side and the high side of the air conditioner units. Another dividing

point is air conditioner compressors.

The meter device is located indoor (air handler) units with the evaporator coils. It's small and hard to see, unless you open the evaporator compartment.



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The meter devices process is showed between points 5 and 6 in PH charts.

Types of air conditioner expansion valve

Have a few types of ac expansion valve in air conditioner units:

1. Thermostatic expansion valve
2. Capillary tubes
3. Automatic expansion valve

I'll discuss the operating principles of two types of air conditioner expansion devices, the thermal expansion valve and the capillary tube.

Thermal Expansion Valve

The thermostatic expansion valve (TEV or TXV) is used for refrigerant flow control and operates at varying pressures resulting from varying temperatures. This valve maintains constant superheat in the evaporator.

Thermal expansion valve has a sensing bulb, which is connected to TXV by a length of capillary tubing. The capillary tube transmits sensing bulb pressures to the top of the TXV valve's diaphragm.

Capillary tube metering device

A capillary tube is a refrigerant control; its common types of air conditioner expansion valve. The capillary is simply a length of tubing with a small inside diameter which acts as a constant throttle on the refrigerant entering the evaporator.

A fine filter or filter drier installed at the inlet of the capillary prevents dirt from blocking the tube.

A recent development in the design of capillary tubes for air

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conditioning system uses capillary tubes with a larger insider diameter and a longer tube length. A larger diameter tubes are less likely to become plugged with dirt and other impurities than a smaller diameter tube.

The long length provides the necessary resistance to create the desired pressure difference across the metering device.

The capillary tube equalizes the pressure in the system when the unit stops. This pressure equalizing characteristic of the capillary allows a low starting torque motor to be used with the compressor.

Typically, a capillary does not operate as efficiently over a wide range of conditions as does the thermostatic expansion valve. However, because of its counterbalance factors in most applications, its performance is generally very good.

Refrigeration systems using a capillary tube doesn't require the use of a liquid receiver since all the liquid is stored in the evaporator during the off cycle. However, a suction accumulator is often found in the suction line to prevent any non vaporized refrigerant from reaching the compressor.

This will prevents damage to the compressor when excessive liquid refrigerant enters the evaporator on a low evaporator load condition.

How does capillary tube works?

The capillary tube can be described as a fixed length of small bore tubing connecting the high pressure side (condenser) of a refrigeration system to the low pressure side (evaporator).

Capillary tube works by restricting and metering the liquid flow, the capillary tube can maintain the required pressure differential between the condenser and the evaporator. Because of friction and acceleration, the pressure drops as the liquid flows through the tube.

In order to reduce the temperature of the liquid to the saturation temperature of the evaporator, some of the liquid must turn into a vapor in the capillary tube, "flash", just as it does with all refrigerant controls.

*Notes: All air conditioner expansion valve works in similar fashion. It shapes, size, capacity, and manufacture are different, but it operation principle are alike.

System Design Factors

The capillary tube diameter and length must be such that the flow capacity at the design pressures (condensing and evaporating) equals the compressor pumping capacity at these same conditions.

For example, if the tube diameter is too small (resistance to high) the liquid refrigerant flow will be less than the pumping capacity of the compressor with the evaporator being "starved" and the suction pressure being low.

Less liquid will enters the evaporator and the excess will build up in the condenser reducing the effective condensing surface and

increasing the condensing temperature and pressure. This pressure change tends to increase the flow in the tube and at the same time reduces compression capacity.

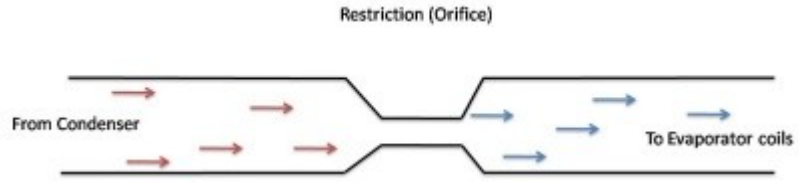
The system will now balance at different from design capacity with a reduction in compressor and system capacity.

If the capillary tube resistance to the refrigerant flow is too low, (diameter of tube too large) the flow rate will be greater than pumping capacity. This results in the flooding or overfeeding of the evaporator and flood back of liquid to the compressor.

The refrigerant system uses a capillary tube selected for capacity balanced conditions. A liquid seal is present at the capillary inlet but not excess liquid in the condenser. The compressor discharge and suction pressures are normal and the evaporator is properly charged.

How does air conditioner expansion valve works?

AC expansion valves work by controlling the amount of refrigerant flows to the evaporator coils. It acts as restriction to provide a specific amount of refrigerant flows into the evaporator coils.



This is the basic principle behind any metering valves.

There are different types of expansion valves used in air conditioner units, but the function of the metering device used in any central air conditioner units are two fold:

First: It controls the amount of liquid refrigerant entering the evaporator coils. The amount of liquid refrigerant entering the evaporator must equal the amount of refrigerant boils in the evaporator coils.

Second: It maintains a pressure difference between the high and low pressure sides of the system to permit the refrigeration to vaporize.

The pressure difference allows the ac Freon to vaporize at low pressure and temperature in the evaporator; while at the same moment, the refrigerant in the air conditioner condenser condenses at a high pressure, high temperature in the condenser units.

Read other **central air conditioner parts**

Air Conditioner Condenser

Air Conditioner Compressors

Air Conditioner evaporator

Return to Central Air Conditioner and Refrigeration Cycle from Air Conditioner Expansion Valve

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CENTRAL AC BLOG

HOW AC WORKS

Air conditioner evaporator coils adds heat to the air conditioner units!

What is air conditioner evaporator?

</BLOCKQUOTE< p>

Air conditioner evaporator is a heat exchange. It takes in low temperature, low-pressure liquid refrigerant from the expansion device and changes it into low-pressure, low temperature vapor refrigerant.

Evaporator coil is the components that add heat to the air conditioner units.

* Notes: refrigeration is the process of removing heat from one area where it is undesirable to an area where it is not significant. For this process to work heat has to flow from one area (medium) to another.

To make heat flows, one of the mediums has to be at a higher temperature. Since, heat always flows from a high intensity to a low intensity.

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TEMPSTAR HVAC
SEARS AC
RUUD AC
AMANA HVAC
GIBSON HVAC
AMERICAN STANDARD
JANITROL AC
ARMSTRONG HVAC
Discussion

Types of air conditioner evaporator:

1. Director-expansion or Air-cooled Evaporator
2. Flooded evaporators

How does air conditioning evaporator works?

Air conditioning evaporator works by absorb heat from the area (medium) that need to be cooled. It does that by maintaining the evaporator coil at low temperature and pressure than the surrounding air.

Since, the AC evaporator coil contains refrigerant that absorbs heat from the surrounding air, the refrigerant temperature must be lower than the air.

The expansion device provides a pressure reduces between the high side and the low side of the system, the saturation temperature of the refrigerant entering the air conditioning evaporator is lower than the medium to be cooled.

One of the characteristic of a ac refrigerant is that as the pressure is reduced the boiling point is also reduced. Therefore, as the pressure is reduced through the expansion device so is the point at which it will boil and become a vapor.

As the warm air from the space passes over the evaporator coil, it gives up its heat to the lower temperature liquid/vapor mixture passing through the evaporator. As the liquid refrigerant absorbs this heat it boils changing from the liquid state to the vapor state.

The amount of heat the air conditioner evaporator absorbs must equal the amount of heat it lost

For instance, if the air conditioning evaporator gives up 100 Btu's of heat to the surrounding hot air, then the refrigerant within the air conditioning evaporator coil must gain 100 Btu's of heat.

The amount of liquid entering the evaporator must be enough, so by the time it reaches the end of the evaporator. It will be completely boiled to the vapor state.

There must be enough air flows across the AC evaporator coil to provides heat to the refrigerant in the evaporator coil. This is just a safety way to ensure the air conditioner compressor doesn't have the liquid refrigerant entering it.

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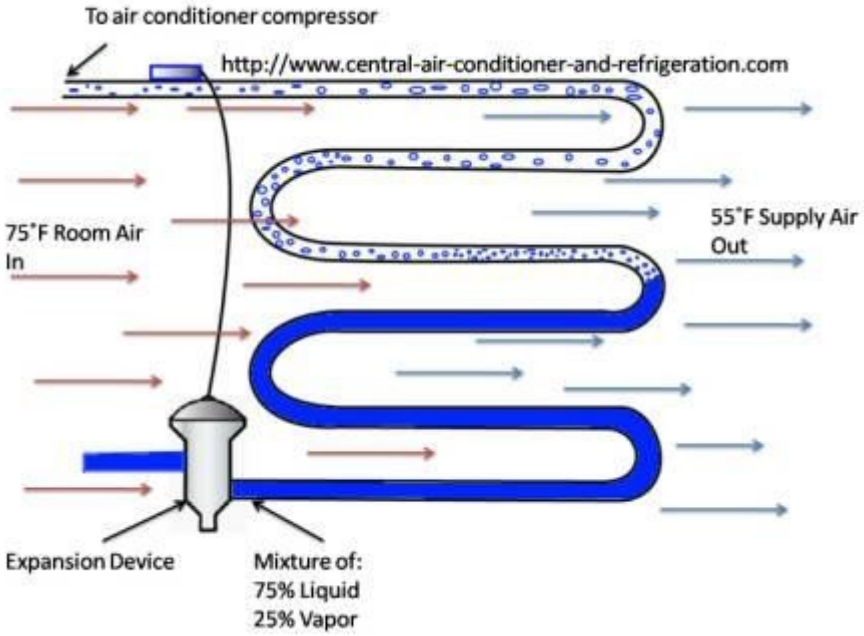

Air conditioning evaporator picture above tells us what happen to the evaporator coil.

The air conditioning evaporator coil absorbs heat into the refrigerant from the warmer air passing over the surface of the evaporator coil. The heat absorbed causes the liquid refrigerant to boil, changing it from a liquid state to a vapor state.

Types of air conditioning evaporator coil:

1. Bare-tube coils
2. Finned-tube coils
3. Flat-plate coils

central air conditioner parts

Air Conditioner Condenser

Air Conditioner Compressors

Air Conditioner expansion valve

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Central air conditioning problems
Read and Write Your Air Conditioner Problems

Central air conditioner problems

I hesitate to write the common central air conditioning problems homeowners had. I don't know how homeowners will use this information.

Just to make this clear. This is for information only, it's not meant to fix central air conditioner units. Now we're done with that. Let's get

start.

Central air conditioning problems mainly fall into four situations: electrical problems, mechanical problems, refrigerant cycle problem, and air flow problem. If you have air flow problem, it will affect the refrigerant cycle and Ac components.

For example, homeowners will call us and said he needs an Ac Freon. We will always ask him basic question, like. Did you change the filter? Usually, it's not the Freon, it's the ac filters. He doesn't know that air flow will affect the refrigerant.

Your central air conditioner units will have problem as it ages. We provide you the opportunity to submit your air conditioning problems here.

The lists below are just the tip of the iceberg. So, if you want to read more; you have to provide us the air conditioner problems.

Read This First:

On average we receive 14 or more questions a day and we can't answer them all or post them online. It would just jam central air conditioning problems page with unanswered question.

If you're really, really need an answer to your question. We ask that you help other homeowner first.

If you provide homeowners a review on your central air conditioner units, we'll make sure your question is our first priority above all other question.

Pick the brand on the left and follow it guidelines. If we didn't have a section for your brand, you can submit to any of the brand on the left.

Make sure you list the same name on the reviews and on this question page, so we know it your reviews. You only have to write one review and afterward you can ask many questions as you want.

Warning:

Most homeowner doesn't understand how their air conditioner works and they'll provide us the wrong information. We're answering their question basis on that information.

So don't follow anything you read in this page! We're not responsible for any information you're putting into action.

Submission Guidelines:

- Provide the serial and model number of the central ac unit.
- You'll have to provide us a lot of details. You'll need to tell us what you hear, smell, see or touch (If you're not sure, don't touch).

  Our answers are basis on the information you provide. So make sure your information is correct. If you provide us the wrong information, you'll receive the wrong answers.

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Here is Do and Don't

For example:

Do – I turn my central air conditioner units On and the condenser fan is running and I could also hear the compressor running, but I'm not getting any air inside my house.

This is better!

Provide us as much detail as you can. If you provide the wrong information, you will get the wrong answers.

Don't – My central air conditioner is not coming on, what wrong with it?

We can't determine your central air conditioning problems with that detail.

- No DIY or FIY Question

Write Your Central Air Conditioning Problems

Or

Read Air Conditioner Problems

The links above is for central air conditioner problems only, if you have a general question. Here is the link:

Central air conditioning unit question

Central Ac Unit Is Running, But The Condenser Wouldn't Turn-Off

You turn the thermostat to off position, but the condenser unit still running. The problem could be:

There is power supply to the condenser units. A switch that supposed to be in the Normally – Open position is actually in the Normally – Close position.

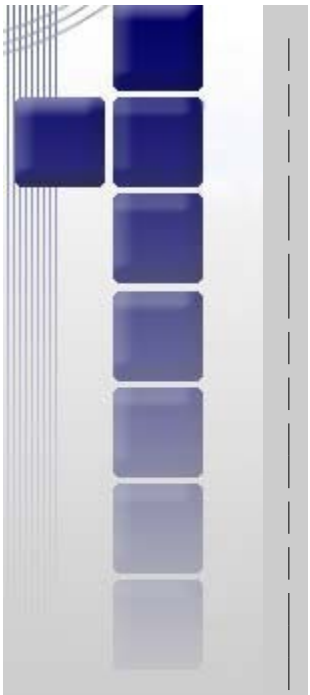
There is Frost Buildup On The Suction Line (big copper line) Or Near The Compressor

You're getting cold air, but the central air condition kept cycling On and Off. Your central ac units cycle On and Off due to low pressure. The problem could be you have dirty filters and the evaporator coils or the Ac Freon is low.

Central Air Conditioning Units Not Blowing Cold Air

If the central air conditioner unit is blowing air, but it not cold. The possible central air conditioning problems could be:

1. The condenser unit is not running, including the compressors.
2. Refrigerant leaks or not enough refrigerant.



3. Dirty condenser coils and the evaporator coils.
4. There could be something wrong with the metering device.

The Condenser Fan Is Running, But The Compressor Doesn't

We know the compressor is not short to ground. If it is short, the condenser fan shouldn't run. Here are the possible problems:

1. Some air conditioner compressor has hard start system that could be the problem.
2. Bad electrical connect to the compressor.
3. Internal safety switch within the compressor is open.
4. The compressor is lock up due to foreign object or liquid refrigerant.
5. Bad capacitor

Central Air Conditioner unit Is Running, But Not Enough Air

You have the outdoor units and the indoor units are running, but you're not receiving enough air from the Ac system. The air is cold, but not enough to cool the house down.

The main device that supposed to move the air within the house is the indoor blower. The symptoms could be:

1. The blower's blade is dirty.
2. Blockage within the duct.
3. Duct leaks.
4. Blower's capacitor is damage.
5. Blower's motor is bad.
6. Blower is on low speed.
7. Dirty filters.

The Central Air Condition Is Making Noise

If the central air conditioner unit is making sound and the sound is from indoor. The only electrical part that is large enough to make that sound is the blower motor.

The sound could be from the blade or foreign object is trap in the blowers.

The Indoor Blower Is Running For A Short Time, Then It Stops.

If the indoor blower motor is cycling on and off, the problem could be the capacitor is bad. The internal thermal overload is causing the motor to do that.

The Condensing Unit Is Not Running.

If the central air conditioning unit is not running and the condensing unit breaker tripped. You try to reset the breaker and it trips again.

The problem could be the condenser fan, compressor and other electrical is grounded.

The Central Air Conditioner Unit Is Running Constantly.

If the central air conditioner unit is running and never stop. The possible central air conditioning problems could be:

1. The ac filter, evaporator, condenser coil is dirty
2. Low on Ac Freon

One Room Is Warmer Than The Other.

If you have one bedroom is warmer than the other bedroom. The possible problem could be:

1. you had a lot of electronic that is producing heat on that specific room.
2. Ducts Leak.
3. The grille is closes.
4. Object is blocking the air flow.
5. Restriction within the duct.

These are the common central air conditioning problems homeowners might see within their central ac units. These are just random air conditioner problems; nothing special.

How do you avoid some of the air conditioner problem?

You can change the filter; clean the evaporator and the condensing coils to avoid unnecessary air conditioner problems. It'll take extra pages to example why. But, it does help.

What Other Visitors Have Said

Click below to see central air conditioning problems from other visitors...

Central Ac Indoor Blower Motor Section

My Central ac system is about 10 yrs old and has been maintained by professionals, since I purchased the home 3 yrs ago. However, I don't want to have ...

Air Handler Fan Relay

April 5, 2011

I have a 3 ton air handler in my attic. The fan relay chatters and the motor inside the air handler turns very slowly, and at the same ...

Fan blows, outside unit clicks, but doesn't turn on -- only at night?!

March 30, 2011

At the duplex we are renting, the technician has been out to service our central air conditioner unit multiple times. He has recently ...

Outside Unit Runs , Indoor Blower Sometimes Does

March 25, 2011

Ok, I have a Lennox central heat and air system in a house I just moved into. When I put the air conditioner mode on the outside ...

Buzz Noise Outside Motor
March 24, 2011

03/23 *if any way Possible need reply "a.s.a.p." , it's starting to get HOT here in Alexandria , La.71302*

We had this central ...

The compressor runs but the fan does not
March 12, 2011
Descripton - 5 ton 12 seer d.p.p. g/e
Model number DAYH-F060N110
Serial Number NALM010365

Problem: When the unit is turned on,...

blower fan runs constantly
February 22, 2011
Thermostat switch is set to off. Fan switch is set to auto. I removed the thermostat and it still runs.

Blower Fan Doesn't Run
Central air conditioner compressor and fan outside starts and runs but the inside Fan (Squirrel Fan) doesn't run, the only way is if I open the cover and ...

No heat, no ac, no fan, no noise
It's not working at all. We've tried readying the breakers, waiting, and it's too cold to do anything else. We've switched the thermostat on and off, onto ...

Carrier central air conditioner shuts down all the time after only a

short time
Room temp taken 26 cels air con on auto runs 1 hour sometimes less shits down and turns right off I have o climb up to the main switch to turn it off them ...

Central air blows hot to reach desired temp. then blows cold instead of

turning off.
I set my central ac system to heat up to a certain temperature but instead of it turning off once it reaches the desired temperature it starts blowing ...

Outside unit running, but thermostat is off

We noticed that our outside ac unit runs (the fan) even though the thermostat control is set to "off" inside the house. Is this a problem with the unit,...

leaking

My central air conditioner unit on the inside of my house is leaking profusely. I checked the pipe for condensation and it is running water very well....

Thermostat problem??

I am working on a heat pump. The inside does not come on when I put the thermostat to auto, but will if I put it in the on position. Now the inside comes ...

Central Ac Not Cool Enough To Turn Off On Hot Days!

We moved in our newly built home in Feb 2003. The house is 4100 sq ft and we had a builder installed Goodman AC unit. The central ac unit worked fine until ...

MY AC RUNS BUT NOT ENOUGH AIR COMES OUT OF THE VENTS

We recently had our Trane serviced, freon added, pressure checked, new fan motor installed on outside unit, furnace coils have been cleaned but, every ...

Outside Unit Not Coming On

I have a Carrier central air unit (model 38ed048300)manufactured in 1983. It has been serviced several times over the years. When I set the thermostat ...

Ruud 10 Seer Central Air Conditioner Unit

My outside Ruud air conditioning unit is having problems. The outside fan continues to run even if the thermostat is set to off. The only way to stop the ...

Central Ac Uni Blowing Warm Air

At first my copper line was freezing, so I called someone out to fix it. The service man said it was low on Freon and charged it. It worked fine for ...

Fan Works. Air Conditioner Compressor Will Not Start .

Started central air conditioner system and it was blowing nice cool air, and then started blowing warm air. I Checked outside. Outside unit was making ...

Air conditioning units kicks on, but not blowing through the vents.

Turn A/c on thermostat with auto fan, A/C kicks on but there is no air blowing through vents, yet if Heat is turned on than there is air blowing through....

No Power To Air Conditioner

The air conditioner was working only if we messed w/the thermostat for awhile then we changed the thermostat and now it doesn't work at all even w/the ...

Central Air Conditioner Not Staying Cool

When I turn my central air conditioner unit on it comes on and cool air comes out, but after 30 to 45 min, it stops blowing cool air but blows room temperature ...

Unusual Behavior to My Central Air Conditioner

Central air conditioner unit is running weird. First the rooms weren't getting cold, so I called in a technician and he put in Freon. After a day of ...

compressor runs for about 5 minutes then thermal shutdown

I have a construction trailer type air conditioner that I transported to another location. It is the type that hangs outside on the wall with a large intake ...

Central Air Conditioner Randomly Stops blowing cold air

1.25 year old RUUD 4-ton Condensing unit (3-phase)with Air Handler (UANL-048JAZ); 410a refrigerant.

When I come home and turn the thermostat down,...

Central Ac unit Running Constant With No Results

1,000 square foot house.

Goodman outdoor unit around 3 years old.

Outdoor temp. around 90.

Had no problems last summer.

Set on 75, runs constantly ...

blower turns on, but not the condenser

When I turn the central air conditioner On I can hear the blower come on but it just blows hot air. Out side the condenser unit doesn't come on.

I ...

Air Condition compressor will not start

When the central air conditioning unit is suppose to start the furnace fan does kick on but outside at the condenser unit the fan is humming and I ...

Cold air - hot air - cold air

My 4-ton central ac unit is 8 years old. The Ac unit works normally for up to an hour then starts to blow warm to hot air.

If I shut it down for ...

Central Air conditioner Unit

My air conditioner Unit is running. The fan is blowing outside in the unit. However I am not getting any air blowing inside the house.

The air conditioner condenser

The condenser unit is making a loud noise and the fan and the compressor is working. The inside unit is blowing. Also cold air is blowing inside the ...

Central air conditioning unit is working, but no cool air

My central air conditioning unit appears to be working but there is no cool air. The filters are clean, there is no build up of ice on the lines and ...

Central Ac Unit click outside, but doesn't startup

the central air conditioner unit will click out side the air handler in the house will run but nothings out side the start-up condenser has leaked ...

Temperture Off and Unit/Furnace Running?

I recently moved into this apartment and the heating appeared to be off and we weren't receiving any heat through are heat ducts. they are the small square ...

Air Handler Blower Fan Not rated yet

April 12, 2011

Getting power to central air conditioning unit outside, nothing comes on. i pushed in on the contactors and everything comes on except ...

AC kicking on every 5 minutes and runs for 2 minutes! Not rated yet

March 1, 2011

This is a brand new 13 seer central ac units and new 3 ton air handler. When set on 74 degrees it kicks on every 5 minutes and runs ...

My Central Heating Works At Random Not rated yet

I made the efforts to change the filters which I do often. But the central ac unit is several years old; however, one day it started blowing much slower ...

Indoor Blower Not Working Not rated yet

The system was blowing air through the vents but there was no cold air. The condenser unit outside was not on. The fuse was checked but the fuse was ...

Blower Motor Goes Off And On Not rated yet
My A/C unit works hard here in Phoenix AZ. The compressor starts up and the blower kicks in all like it should. However once in a while, not all of the ...

Leak Occurs After Installing New Primary Drain Pan Not rated yet
Recently had a new primary drain pan installed in York central air unit to eliminate water leaking. Condensing unit is located in the attic. Outside unit ...

Central AC Power On And No Air Not rated yet
I have a central ac unit that has been working fine last year. This year I have not turned it on except earlier in the year for winter (turned on the heater)...

Condensor Unit Keeps Blowing Fuses Not rated yet
After replacing a fuse the unit may run for a few hours before blowing another fuse or could take several days. had a repair technician come look at the ...

Central Air Compresior Not Working Not rated yet
Over the last several days the power has went out and come on real quick. On Saturday they blinked really quick. That is a problem with AEP. Sat. Morning ...

Top Fan Stopped Not rated yet
Well, it started when I got home and e house was HOT 91 degrees. It was blowing air out the vents so I checked the key pad it was on cold. I then went ...

Central AC Unit Intermittently Makes Noise And Stops Cooling Not rated yet
I have a Goodman model # SSZ140181AC central AC unit which was installed a little more than a year ago. The unit worked fine up until about 2 months ago ...

Exhaust Fan Not rated yet
I have noticed the exhaust fan has not been on and i notice them often. Upstairs is working and the outside fan cycles, but the down stairs unit blows ...

Exhaust Fan Not rated yet
I have noticed the exhaust fan has not been on and i notice them often. Upstairs is working and the outside fan cycles, but the down stairs unit blows ...

Central AC The Blower Motor Keeps On Shutting Off. Not rated yet
I have had Ann Oil Company going to a house to fix a problem with the blower motor, it keeps on shutting down, they kept use a new excuse each time. I ...

Thank you for your great web site on A/C! Mine just died! Not rated yet
I have learned a lot just by reading/finding your web site. My A/C is 6

yrs old; it is Carrier model # 38ckc042350. It has been working great for the past ...

Outside Unit Humms Not rated yet
I have a Carrier outside unit. It was working fine all summer till the other day i noticed that the house was getting much hotter.

I turned the ac ...

Compressor Does Not Shut Off Not rated yet
Central AC set temp @ 78F this summer. Getting cool air and the fan stop blowing @ 78F. But the compressor unit outside keep on running. Need to remove ...

Central Ac Unit Constant Running Not rated yet
This morning my husband and I woke up to a freezing house. Our thermostat (which we set at 72 degrees) showed 62 degrees and the air conditioning was ...

Intermittent Compressor Start Not rated yet
I have a York condenser (sorry no model number right now) that is about 6 years old. Lately, when I turn on the A/C, there's no issue, the compressor ...

Central Ac Unit Is Suspect, Not Working Properly But Told It Is. Not rated yet

I have all three problems that is described on the CAC problems page. I live in Arizona and the house is six years old. Two Carrier Units two zones....

Compressor Does Not Come On Not rated yet
My air conditioner compressor does not turn on.
Air handler goes on but not compressor. Could
it be the contactor? What else? It is an American ...

Compressor In Condenser Unit Running Loud Not rated yet
Our central air conditioner unit seems to be running fine that we can tell, but it seems our compressor is running louder than normal. There is a loud ...

Ruud Air Conditioner Unit Will Not Run Not rated yet
Air conditioner Unit does not start. Line voltage good, good control voltage to unit. If I jumper out one of the switches it starts.

It is on large ...

Central Air conditioning Capacitor Not rated yet
We have power going to an central air conditioner,I think its the capacitor, I bypassed the capacitor and the compressor came on. but I'm still not sure,...

Return to Central Air Conditioner and Refrigeration Cycle from Central

Air Conditioning Problems