Commercial HVAC Guide

AC POWER
AND COMFORT INC

Introduction

Why was this guide created?

The purpose of this detailed guide is to ensure you have a reliable source of information that can empower your decision making process with any type of HVAC need.

Who is this guide for?

I wrote this guide for:

- Commercial property managers
- Facility or building engineers
- High-rise building managers
- Estate managers
- HOA board members
- HVAC contractors
- Project managers
- Facility maintenance managers

Chapter 1 - HVAC Basics

Here I cover all the fundamentals of HVAC systems.

Chapter 2 - Common HVAC Problems and Solutions

Time is money, and when it comes to HVAC equipment, downtime could cost you big bucks on repair and possibly losing business. To rapidly identify problems and solutions is essential when it comes to HVAC systems, where a domino effect could cause more problems and increase the overall operational quality.

Chapter 3 - HVAC Maintenance

One of the most ignored parts of HVAC systems and one of the most important to extend the life of the HVAC equipment.

Chapter 4 - Evaluating HVAC Professionals

Everything you should know to evaluate and hire the right HVAC technician and avoid headaches.

Chapter 5 - HVAC Troubleshooting

Everything you should know to evaluate and hire the right HVAC technician and avoid headaches.

Chapter 6 - HVAC Glossary

Knowing all the right words could be the difference between getting the right part fixed or getting more problems.

HVAC Basics

Facility maintenance managers, HVAC contractors, HOA board members, estate and high-rise building managers, building and facility engineers and commercial property managers all have one important responsibility to think about - **running an HVAC**.

Heating, Cooling and Air Conditioning operation is vital to any part of real estate, whether for residential, commercial or industrial purposes.

Here's a list of HVAC system fundamentals:

What is HVAC?

Heating, Cooling and Air Conditioning systems are tasked with circulating fresh air within living spaces, while maintaining optimal temperature to keep the people residing inside comfortable. Maintaining an efficient, working HVAC system is paramount to keeping management smooth and provide thermal comfort.

Parts of an HVAC System

Property managers should have an idea of how an HVAC system operates and what to do when complications occur. Here are the most important things to remember about each part:

Compressor

The heart of an HVAC system, compressors pump the refrigerant throughout respective components in a looping pattern. The refrigerant comes in the compressor as low-pressure vapor and exits it as high-pressure vapor.

Condenser Coil

This HVAC system component is responsible for rejecting the heat load

absorbed by the evaporator coil. Thus, if the condenser oil is neglected improper cooling will occur and it causes a high head pressure.

Evaporator Coil

This component absorbs the heat load to the condenser coil for eventual rejection. If the evaporator coil is impacted or dirty, then the HVAC will have improper cooling and low suction pressure.

Condenser Fan Motor

Condenser fan motors help in rejecting the heat load and maintaining optimal head pressure for proper compressor operation.

Evaporator Blower Motor

Dirt and small pieces of debris may get stuck inside the blower assembly, causing the air circulation to be interrupted. The evaporator blower motor needs professional maintenance once a year.

Thermostatic Expansion Valve

The TXV is a device that regulates the amount of liquid refrigerant flowing through the evaporator. It is designed to maximize evaporator efficiency while diverting the flow of excess refrigerant back into the compressor (called a floodback).

Cooling Tower

Component of an HVAC system which rejects the heat load absorbed by either the heat pump or evaporator coil carried by water. The water in it transports the heat load which was absorbed by the evaporator coil, dissipating in the cooling tower. The water that passes via heat exchanger normalizes head pressure.

Chiller

It is a machine that provides chilled water. The chilled water is used in conjunction with the HVAC system's cooling capability with respect to the other HVAC parts.

Pumps

These components are primarily designed to move water at the chill water supply and condenser water supply sections. Pumps that move chill water supply at 44 degrees are sent to fancoils, and once the water reaches the fancoil, temperature rises to roughly around 47-52 degrees. Pumps that move condenser water supply are rejected at cooling temperatures ranging from 90 to 100 degrees. Factors such as demand load, ambient, the cooling tower fill's condition, and strainers can vary the temperature during circulation.

Duct System

It can either be rectangular or spiral, flanged or drive. The main trunk line is where the main HVAC air flows, branching out to distribution points that carry the cooled or warmed air into small office suites and large conference rooms in commercial buildings.

Boiler

The boiler is a pressure equipment which heats water. The choices when it comes to selecting boiler types are either low or high pressure systems, or hot water and steam.

Energy Management Monitoring Systems

Also known as BAS (Building Automation Systems), this HVAC component helps schedule, control and monitor commercial equipment such as cooling towers, pumps, package units, air compressors and handlers, boilers, temperature sensors, chillers and VAV boxes within the office and in office living spaces.

What You Should Know About HVAC

HVAC systems are vital for property managers in a number of ways. Whether for a number of house rentals, an apartment building, commercial complexes or large industrial settings, an HVAC system is what keeps optimal temperature inside working spaces. Managers should consider regular HVAC system maintenance to keep operation running smoothly and ensure a longer HVAC system lifespan.

How To Identify Different HVAC Equipment Types

Split Systems

A split system usually means cooling or heating products residing inside and outside the complex. This type is the most utilized among both air-conditioning and heating systems. You can see them in most commercial complexes, where the components are located both indoors and outdoors.

Hybrid Heat Split

The hybrid is a more advanced version of the split-type HVAC, with a more improved energy efficiency operation. It allows for adding a heat pump for electrically-fueled HVAC operations, going beyond the typical gas furnaces of today.

Ductless Split System

A ductless system won't have any air ducts to regulate optimal air inside homes or buildings. This type of HVAC system is most often used in room extensions, where ducts won't be able to reach it. Examples include garages, exercise rooms and home theaters.

Packaged Systems

Packaged systems usually include one or two heating or cooling units to maximize efficiency into one seamless unit.

The Roles and Responsibilities in HVAC Equipment

Building owners or commercial property owners should have their HVAC equipment checked and thoroughly inspected around 2 to 3 times per year to make sure the tenants are maintaining the property well, and to see that there are no major issues within the complex. Property managers should include the inspection and maintenance of their HVAC systems during these checks.

Property management service will need to keep up with their tenant's demands when it comes to heating and cooling needs. Complaints about not getting enough cold or warm air should be worked on in urgency.

It is necessary to know an expert in HVAC systems, one who has

intricate knowledge on how they work, how the systems are designed and how the parts fit in. They should be knowledgeable on repairs, installations and services on heating and cooling systems such as furnaces, heat pumps and air conditioners.

Prevention is still the best way. A regular maintenance schedule annually should be done to inspect, clean and repair the HVAC components for optimal operation.

The Most Important Things To Remember About HVAC

Commercial spaces often have utility as one of their largest expenses, but now there's an option to be more energy efficient, thus lowering the overhead costs of operation.

Knowing the right type of HVAC system to use and keeping it running smoothly is good for all people concerned, be it building or property owners, tenants and contractors.

Regular maintenance of your HVAC system prolongs its life and it raises the property's asset values.

Common HVAC Problems and Solutions

HVAC systems are very reliable in performance. However, it does not mean that they do not have limitations in their functioning. Whenever your HVAC system has a problem, it is often a stressful encounter that should be dealt with as soon as possible.

In places where the summer temperatures are relatively warmer, losing your HVAC system to the common problems can even force you to shut down your place of work or business due to the unbearable conditions.

The common HVAC issues include ventilation, air conditioning and heating problems which arise through the various parts of the system.

It is recommended to have the basic knowledge about the problems as well as the appropriate solutions so as to ensure your system is functional at all times. Some of the problems may be easy to handle and therefore you may offer the right solutions by yourself. However, for the problems that are more complex, it is advised to contact a professional to handle the situation. When the HVAC unit is non-functional and maybe a service call has been placed for a professional to come and handle the problem, there are common parts which should be checked out. The common problems and solutions of each of the parts have been discussed below to guide you in solving any HVAC problem that you may have.

The Common Problems and Solutions of Various Parts Of The HVAC System

1. Condenser fan motor

The condenser fan motor features the contactor which engages when there is need for cooling so as to create and electric connection. This in

turn starts the motor. Contactors are also found in both the compressor and the blower motor. The common issue about contactors in the condenser fan motor is getting worn out. Pitting also forms on the contactor which makes it difficult for the passage of electrical current and therefore the condenser fan motor may fail to start. Capacitors are another part of this motor which may burn out and inhibit the HVAC system's functionality. The capacitors offer the compressor a slight increase in the starting torque.

Check on the contactor and the capacitors

It is recommended to contact a technician to check on the Condenser fan motor in case your system is not cooling the room, so that they can check on the contactor and replace it if necessary. The technicians will also replace for the capacitor if it is burnt out and you will have your HVAC unit working well

2. Evaporator blower motor

The evaporator blower motor also features the contactor and also the capacitors which should be checked to ensure efficient performance of the HVAC unit. Another common problem that arises with this motor is a blown fuse. This problem is also common to the compressor and also the condenser fan motor. The fuse protects the motor against overheating when the system is heating the environment.

Replace the blown fuse

If the HVAC system is not functioning, the breaker might have flipped off and therefore requires prompt replacement. It is best to have a technician do the replacement for you if you do not have the knowledge and ability to do so.

3. Condenser Coil

It is placed outside together with the compressor for exposure to the outside elements. This implies that they get dirty often and need to be cleaned at least after every year. This may be done using a water-hose when the system not operational. If the grime and dirt get worse, the HVAC system will have to be cleaned by a technician who will have to use a chemical cleaner.

Increase airflow to the condenser unit by cleaning

Apart from having a technician offer you a the chemical cleaning solution, you may go to the condensing unit outside and clear any dirt or grime on the unit's exterior since it may be blocking the airflow. Some of the debris may come from grass which comes from the mower. The grass collects on the exterior of the condenser and by clearing it; you may have solved the system's airflow issues. Tall plants that are closer to the condenser may also block the airflow. They should be trimmed or removed completely.

4. Thermostatic expansion valve

The thermostatic expansion valve signals the HVAC system on what is supposed to be done and when it should be done. In some cases the thermostat may turned off accidentally or has the wrong settings and therefore before contacting any help, it is good to ensure the thermostat is on. Another common issue with the thermostatic expansion valve is the batteries of the thermostat which may need replacement for consistent performance.

Check the batteries and ensure the thermostat is on

It is recommended to check the batteries of the thermostat. If it is not lit up, the thermostatic expansion valve may be non-functional and the batteries should be changed. You should also make sure the thermostat is on and the settings are correct before concluding that the thermostatic expansion valve is problematic and finding a technician. Contact a professional to handle your situation if it appears more complex.

5. Compressor

The compressor is known to be the HVAC unit's main part (the heart of the system). When the system is undercharged with the refrigerant liquid, the compressor runs hot and eventually quits operation. When it is overcharged, the liquid refrigerant gets back into the compressor which leads to liquid slugging.

Ensure the compressor has the proper amount of refrigerant liquid

If you are not sure about of the correct refrigerant, a good solution

would be to talk to an HVAC technician who will recommend the right amount. It is vital for the A/C system to have the correct amount of liquid refrigerant for the effective performance of its main part; the compressor.

6. Evaporator Coil

Returns from blocked air or air filters that are clogged may limit airflow in the Evaporator coil. This causes the freezing up of the coil. This problem may also be caused by low refrigerant levels. On the split units, the evaporator coil is placed in the roof (attic). On a package system, the coil is placed outdoor with the rest of the HVAC system.

Clean the Evaporator coil

If the evaporator coil is placed in the attic, cleaning will be needed only when suggested and this will be about after every three years or more. The coil placed outside of the system also needs cleaning at least once after every three years. In case of a cracked evaporator coil, you will have to find an HVAC technician to fix it.

7. Filters

The filters of the HVAC unit get clogged and dirty with time. When it happens, the filter should be changed. When the clogged filter remains unchanged, the airflow is reduced and this causes the system to freeze. One way of telling when the filter should be changed is by holding it up to light so as to check whether light passes through it. If the light does not pass through, the filter definitely needs to be changed.

Change Air Filters

This is one of the most preventable issues, since you only need to remember to change the air filters. The furnace filters should be changed often so as to prevent problems. The inexpensive filters should be changed monthly for efficient performance of the HVAC unit.

8. Cooling tower

One of the most common problems associated with the cooling tower is leakage of the refrigerant liquid. Leakages may be result from the vibrations of the system when it is operating. Unfortunately, leakage of the refrigerant liquid in the evaporator coils and the condenser cannot

be repaired.

Find a HVAC technician to charge the refrigerant

If the leakage occurs at any other part apart from the evaporator coil and the condenser, a technician will offer appropriate help. They will remove the remaining refrigerant liquid and charge the levels back to the proper amount. These can be caused by the vibration of the unit during use.

9. Duct system

A common issue in the duct system is caused by grime as well as other organic materials which building up within the lines. This causes water to flow back in and eventually overflow the drain pan. It, in turn, causes damage to the components of the system. The duct system often gets clogged with algae or dirt and when the water fills up the drain pan, it may leak over to the entire system and lead to damage

Check the entire duct system and clean the drain line

HVAC systems have a water-safety switch for stopping their operation if the water might leak into the house and damage the floors and the ceiling. You should also check for water in the drain pan placed under the system since it helps you to know whether the drain line is clogged with dirt. The drain pan should simply be emptied and the drain line flushed out and you will have solved the issue since the unit could start functioning again.

10. Pumps

It is not usual to find ice either outside or inside of the heat pump or the central A/C which includes the outdoor unit, indoor unit and the interconnecting line-set. However, icing-up of the indoor coil may be possible if the unit is operating in very cold weather conditions or when the thermostat is adjusted to an extremely low temperature. This causes icing up within the pumps which makes them less functional. Heat pump owners who are new to them may think that the unit operates at all times since they are not used to longer operation times and the lower temperature generated by a heat pump. In weather conditions that are extremely cold, a properly functioning heat pump operates almost continuously and that is how it is designed to function.

This should not be considered an issue with the pump.

Ensure the temperature level is appropriate

It is recommended to always maintain the temperature above 70 degrees when the system is operating. Turning below 70 degrees could cause the indoor coil to freeze up or frost and probably cause the sweating of the duct-work. This might lead to damage on the walls or the ceiling. If the air conditioning is required in the time of winter, especially in businesses and restaurants, a (Low ambient kit) is needed in this case and should be installed by a HVAC professional to ensure your pumps are performing effectively.

11. Controls

Controls such as the safety switch in the drain pan placed under the HVAC system should be checked. A common problem which is experienced in attics involves where boxes which are being moved bypass the latter switch, which could cause a huge water mess in your house. Another control that would be a slight problem is the switch of the thermostat which you should make sure is on as it may be switched off accidentally which will have you concluding that the unit is failing.

Avoid bypassing the safety switch and ensure the thermostat is switched on

It is advised to avoid bypassing the safety-switch in the drain pan under the system to avoid a water mess in the house. Also make sure the thermostat is switched on and is in the correct settings to ensure the HVAC unit is running effectively.

12. Boilers

Boiler systems that feature circulation pumps which have couplings have a common problem which is the breaking of the couplings which leads to loss of the hot water circulating through the boiler's water loop. This limits the system's functionality.

Contact a specialist with the skill to replace

In case you have any problem with the boiler, contact the plumbing technicians and the HVAC professionals and ensure the technicians contacted are specialized in dealing with boiler issues. The perfect solution involves replacing the broken coupling so as to restore the flow

of water into the water loop. It is very important to ensure that both the pump motor and the circulation pump bearing assembly have the appropriate lubrication and are moving freely before the replacement of the coupling.

13. Chillers

Chillers are maintained and inspected often. Despite the regular inspection, their common problem involves degrading in performance over time due to leakages and clogging of dirt within the system. Another common problem on chiller is the accumulation of scale over time.

Cleaning and ensuring there are of leakages

The chiller may undergo either mechanical cleaning or chemical cleaning depending on the intensity of the clogging. Mechanical cleaning gets rid of mud, sludge, algae and other loose materials from the smooth-bore tubes. Mechanical cleaning includes; brushing the tubes, removal of the water-box covers, and flushing the chiller using clean water. For the tubes that are internally enhanced, it is recommended to seek professional advice regarding the recommendations for mechanical cleaning. Chemical cleaning, on the other hand, removes scale from the chiller. For chemical cleaning, you will have to contact a professional to handle the job since they will recommend the correct chemical solution needed for the job. After the chemical cleaning, mechanical cleaning should be done thoroughly on the chiller

CONCLUSION

Being knowledgeable about the most common problems on the various parts of the HVAC system together with their appropriate solutions is greatly beneficial. The information above will guide you in detecting any problems that may arise on your unit and also help you in employing the most appropriate solutions to ensure that your HVAC system is running efficiently always.

HVAC Maintenance

Maintaining a comfortable and pleasant work environment is indispensable yet it is often taken for granted by professionals in charge of installing and maintaining an efficient HVAC system.

This is until the air conditioning system fails and the environment becomes both utterly unbearable and extremely uncomfortable for both personnel and customers.

To ensure the environment in a facility is comfortable, HVAC systems in commercial settings run all year long, making them vulnerable to random breakdowns.

Regularly maintaining commercial equipment has the basic role of ensuring the HVAC commercial systems perform optimally without malfunctioning. This is because when a commercial system fails, the facility is greatly disadvantaged and normal operations can slow down significantly.

Keep in mind that in order to thrive and survive in the current cut-throat business environment, you have to ensure the environment is comfortable for both customers and personnel. A great physical business environment keeps staff motivated and helps to gain consumer trust and loyalty.

Hiring the right HVAC company gives you an upper hand by ensuring your HVAC system remains in good working condition.

The ideal HVAC maintenance company comes up with a maintenance schedule that is customized to meet the needs of your system.

Here is a brief but detailed illustration of how important and how critical it is to maintain commercial HVAC equipment.

Benefits Of Regular HVAC Preventative Maintaining

- It helps in significantly lowering operating costs

Poorly maintained HVAC systems are disadvantageous because they not only use up excess energy causing exorbitant utility bills, but also make HVAC machines vulnerable to breakdowns. Keeping these systems maintained requires professional that is additional expense which totally worthwhile. Periodically scheduled maintenance of HVAC equipment ensures they operate at peak capacity therefore needing no repair. Additionally, it keeps your light bill in check by using up energy efficiently. This cuts down your maintain costs by a considerable percentage.

To cut down operating costs of a HVAC system there is need to have stable repair costs done by a reliable and reputable maintenance agency. HVAC system taken care of on a continual basis ensures you avoid large repair bills that can over-extend your budget.

Better energy efficiency is perhaps one of the most alluring of maintaining commercial HVAC systems. Apart from helping you keep all clients, employees and tenants comfortable, maintenance of HVAC equipment also ensures you operational costs are affordable.

Clean condenser coils ensure energy is saved while a well-charged coolant system keeps office temperatures comfortable. A penny in maintenance saves dollars in repairs; this is because problems start small and are unnoticeable in the evening. Modern AC units are specifically designed to last for many years; the downside of this is that most people forget that routine maintenance is needed for the HVAC machines to provide long term service.

- Extends the life of your HVAC equipment by many years

Failing to keep your HYCA machines maintained negatively impacts the lifespan and durability of the equipment’s parts. It puts you at a greater risk of requiring you to spend a lot of money replacing spare parts. A HVAC system breakdown can result is detrimental consequences such as loss of inventory and loss of customer trust which ultimate lowers revenue.

- Improves comfort levels

The most basic benefit of maintaining commercial HVAC systems is

because well maintained systems work better. If HVAC machines are dirty or has serious problems that have gone undetected you may end up with unpleasant lukewarm air coming out of AC vents. If your system is in very bad condition, a commercial facility can even be uneven cooling.

- Increased Reliability, Convenience and Peace of Mind

Maintaining HVAC machines ensures that there is no abrupt breakdown that can causes a great inconvenience. Additionally, it also ensures that any pertinent issues are handled quickly before the damage worsens. A good maintenance plan ensures that routine management is scheduled on priority base. This ensures that in case any problems occur, there will be no overextend amount of downtime. Catching issues such as leaks early makes it easier keep the machines in great working condition.

Record keeping that is involved in maintaining commercial HVAC equipment ensures that there is adequate information concerning which machines need repairing immediately and which ones are extremely inefficient and require replacement.

Problems that can be avoided by simply maintaining your Commercial HVAC system

Ensures there are no consistent tenant complaints that can affect the reputation of a facility

- Keeping the HVAC system in great working condition prevents loss of customers and decrease in sales because of customer dissatisfaction and inconvenience
- Prevents reduced employee productivity

When the environment becomes uncomfortable and unbearable it becomes very difficult for commercial workers to perform optimally. The reduced employee productivity is avoided by ensuring the employees have a great physical environment where they are motivated and comfortable. Keeping your employees comfortable no matter the season; whether it is summer or winter, staff morale should never be decreased. Ensuring your staff works in a great environment no matter the season ensures your heat system can stand up to the rigor or winter and the problems of summer.

- Prevents the warranties of your HVAC equipment from being rendered void

Regular maintenance of HVAC commercial machines ensures that all the equipment warranties remain in force. HVAC systems need regular maintenance to stay in tip-top shape otherwise a warrantee can be voided. Neglecting annual maintenance is among the leading reasons why HVAC warranties are voided. Most HVAC equipment warranties state that the machines have to be tuned up once a year by a certified HVAC contractor. Clearly, HVAC warranties and maintenance go hand in hand.

CONCLUSION

Maintaining HVAC equipment gives your client peace of mind and eliminates the constant fear that the HVAC can breakdown at any time. A commercial facility ensures that employees are kept comfortable and budget is not negatively affected. Maintenance of HVAC equipment depends on the size and complexity of the system in question. To ensure your system is well maintained and thoroughly checked to ensure no issue goes unnoticed, there is a critical need to hire a HVAC maintenance agency that is equipped with certified, knowledgeable and experienced HVAC contractors.

Evaluating And Hiring HVAC Professionals

Choosing the right HVAC technician is easier said than done. Honestly speaking, it's a tough job. The industry is full of dishonest and untrustworthy companies that are out there to rip off your hard earned money and provide you with shoddy repair and replacement services. Considering that your HVAC system is an essential part of your home's comfort and environment, it's critical that you do a proper evaluation on a HVAC technician before hiring one.

In this case, it's important that you hire an adequately trained and experienced technician who can effectively install, maintain, and/or repair your heating, ventilation, and cooling system. This article provides you with a well laid out and comprehensive guide on how to evaluate the best HVAC contractor, hassle –free.

When the Deal is Too Good, Think Twice

"If it seems too good to be true, then it probably is." And" when the deal is too good, think twice".

It's normal for HVAC companies to advertise their services and offer seasonal special offers throughout the year. However, there are a few shady companies that advertise services that are too cheaper compared to others and sometimes offer free services- these are the companies you ought to avoid completely if you want to save your hard earned money. Their dirty trick lays in the services charges. They often burry additional charges (charges that were not included in the quote) in other repair and replacement fees. So, be on the lookout before hiring a technician from such a company.

Education, Extensive Training, Experience and Modern Technology Knowledge are crucial requirements

Many home owners always fail this step- checking your technician's educational qualification documents, their level of training and skill, their experience, and their knowledge of modern technology. These are key component in a HVAC technician because they depict his ability to deliver quality services and provide exceptional customer service.

Make sure the technician has the necessary educational and training qualification documents, information about his experience in the industry (whether full-time or part-time), and his expertise and level of knowledge in operating modern HVAC system and related tools and equipment. Also, ask the technician about other available modern technologies and power saving options for a new HVAC system.

Company's Reputation-Credibility, Reliability, Quality Service and Exceptional Customer Service

Would you buy an air conditioning machine with a bad rap of providing inferior quality products or from a company with a reputation of providing superior quality products? Of course the former wins. Why is that? Because a company's reputation greatly influences your purchasing decision.

It's the same case here. If you want a technician who can provide high quality HVAC repair or replacement services, you need to hire from a company with a solid reputation in term of high-quality services, credibility, reliability, affordability, as well as exceptional customer service. You are guaranteed of quality services and assured the job will be done right the first time.

Beware of Technicians who do Not Have References

If the technician is as legit as he claims to be ask him to provide you with a list of references that he has provided heating, ventilation, and air conditioning repair/ replacement in your area. Make a point of reaching out to those previous customers and inquire of what they thought of the technician's service. The feedback will help you decide whether to hire him or not.

Please note that if the contractor cannot provide you with references, it means he is lying about his previous experience and probably everything else.

Does the Technician have License and Insurance?

Did you know that if your home experiences a tragedy such as a fire or water damage, insurance claims may be denied if the work was completed by a company without a license permit? Probably not, and this is where most home owners often go wrong when hiring the services of a HVAC company.

The health and safety of your family is at stake here and hiring a technician without checking their license and insurance and whether the two are up-to-date is quite risky.

Which Brands Does the Technician Service?

There are countless HVAC brands on the market and some technicians are only familiar with two or three. During your first call, ask him whether he is familiar with your specific system's brand. A good technician will be honest with you. If yes, he should be experienced and know how to trouble shoot whatever issue your system might be having.

Again, make sure you are hiring from a reputable company to avoid unnecessary headaches and disappointments.

Beware of Price Estimates that are too Low

We all want to keep some extra coins while hiring any kind of service. In other words, we love cheap and affordable services.

But this doesn't always work every time, especially when it comes to home improvement services such as HVAC repair/replacement.as stated earlier, if the deal is too good, think twice. If the technician offers a price estimate that is too low compare to others, it could be that he has a habit of cutting corners or does not do things according to the manufacturer's specs. It's better if you paid more for guaranteed services that pay low only to get the worst kind of service.

Is the Technician Listed on the Registrar of Contractors records?

The Registrar of Contractors provides records of its registered technicians depending on their wok quality and service rendered. This is

a special organization body focused on helping home owners and business owners hire the right professionals. HVAC technicians who are fully committed to their jobs will surely do everything to appear on the records. If other options have failed, this is a good place to look.

Consider the Skills, not the Size of the Company

A vast majority of people have this weird perception that a big company guarantees quality services while smaller companies deliver the opposite. This is so untrue. You cannot judge a book by its cover. It's the skills, good reputation, and exceptional customer services that matter most, not the size of the company.

Thus the Technician provides HVAC Repair/Replacement Services?

In summary selecting the best HVAC system normally requires a lot of research so that one is not disappointed with the end result. The above criteria clearly helps individuals in doing this.

HVAC Troubleshooting

Commercial heating, venting, and cooling systems do more than just to regulate the temperatures in the building. If there is a defect in the commercial HVAC systems, it can affect the satisfaction and health of the occupants, the productivity level, and the energy bills. That is why it is crucial to have a proper maintenance of the HVAC systems. Regular checkups and maintenance of the HVAC systems help you to identify the possible faults and solve them in advance.

Common HVAC Systems Along With Their Problems and Solutions

Chillers

A chiller helps to condition the air and offer a perfect environment in a commercial building. The chiller will basically have various problems linked to it, but here are the top troubleshooting issues.

1. Oil failure

There will be an oil failure if there is a refrigerant leak that leads to low oil in the chiller, the oil pump is damaged, or there is low superheat in the chiller.

2. Low/High-Pressure issue

Low pressure is normally caused by a broken capillary of the power assembly, insufficient water flow, mud coating on the tubes, a blocked water filter, or a low refrigerant.

The chiller can also encounter a high-pressure issue if the water-cooled condenser has a buildup of minerals that affect the water quality, or if the condenser has no or poor flow. On the other hand, the temperature of the chilled water tank might be over 80 degrees Fahrenheit.

3. Starter trip or blown fuses

This can happen if the motor, wires, or compressor are over-amped or

shortened. The best solution for this is to check for shorts or grounds and fix them accordingly.

4. Freezestat

This will occur if the water flow is poor or if the thermostat has been set lower than the required level.

5. Lack of flow

There might be a proof of flow if pressure or flow switches in the water circuit are not getting the right amount of flow. Also, the water valve might be off, or the water filter might be blocked. Though in most cases, the flow switch paddle might be broken.

6. The chiller is running but doesn't reach the thermostat settings

Here, the evaporator might be iced up from the inside, or the antifreeze could be broken. Also, the system load could be too heavy for the chiller to handle.

These are the common issues you would expect to experience with the commercial chillers. For that, always understand how the chiller works and how you can identify each problem with ease.

Chillers maintenance tips

Proper maintenance of your chiller will help you avoid the common and other rare problems with it. Here are some maintenance tips to help you.

- Keep a daily report. A daily log of the chiller plant helps you maintain its efficiency. This way, you will know all the operating condition history such as the flow rates, pressures, temperature, and fluid level. You can depend on the remote monitor technology to inspect the unit.
- Treat the condenser water time and again to avoid corrosion, scaling or other biological growth.
- Avoid changing the flow rate of the chilled water, which can affect the performance of the chiller. Ideally, maintain a flow rate of between 3 FPS and 12 FPS.
- Clean the tubes regularly to enhance the heat transfer efficiency.
- Lower the temperature of the condenser water entering the chiller.
- Evaluate the lubrication oil of the compressor once in a year.

Preferably, send a sample to a lab for chemical analysis. This will help you know if you need to change the oil or not.
- Inspect the motors and starts operation for any fault.
- Install Variable Speed Drives for energy saving benefits.

For the complicated issues, always contact a professional HVAC contractor.

Boilers

During cold seasons, the boilers tend to play a huge role in the commercial buildings. For that, it is important to understand the common problems that affect the boilers, and how to solve them.

1. System overheat

When there is a system overheat with the boiler, there could be an issue with the system controls. If that is the case, you will need to check the temperature settings, safety switches, or the voltage. Also, the control thermostat might have failed, or the high-limit thermostat could be ON. You can check the temperatures in this case.

2. Failure to meet the system load

If the boiler fails to meet the system load, the potential problem could be that the boiler thermostat hasn't been set correctly. Check the settings of the thermostat to fix this issue. There could also be an issue with the combustion. Ideally, check the combustion quality, the flue, and the flame to ensure the combustion is perfect.

3. Ignition failure

If the boiler doesn't ignite, it could be as a result of various defects. First off, the internal controls of the boiler might have failed, which can be solved by resetting or replacing the controls. There could also be an over-heat of the boiler, or maybe the cut-out was not reset. Other than that, the pilot flame might be missing, and the supply fuse could be isolated or blown. In other cases, the main burner might not be igniting.

4. Fumes issues

If there are fumes in the boiler room, there could be issues with the combustion. Also, the combustion might be experiencing poor airflow. To solve this, inspect the chimney and the boiler room to ensure that the combustion is correct.

5. Overheating and noisy boiler

In this case, there could be a poor circulation in the main circuit. The solution is to vent the system accordingly. If there is a low discharge pressure in the shunt-pump, check for any obstruction in the piping.

6. Continuous firing

If the boiler fires nonstop, the main issue might be a faulty thermostat. You can inspect the thermostat and replace or repair it where necessary. If there is an issue with the wiring, inspect and repair as required. The control valve could also be sticking or faulty. You can replace it to solve the problem.

Other possible problems with the commercial boilers could be a fault in the flue gas system, or the boiler might start but the flame goes out afterward, as well as high or low water temperatures. If you can't fix any of them, contact a qualified commercial HVAC contractor.

Cooling Towers

The cooling tower is basically a heat exchanger that utilizes air and water to shift the heat from the AC units to the outdoor environment. Here are the common HVAC troubleshooting of the cooling towers.

1. Leaking issues

Leaks are commonly experienced with cooling towers, which then ends up damaging the building. Ideally, find a professional contractor to inspect the cooling tower for any possible leakages.

2. Original coating delamination or breakdown

The original coating of the cooling tower could de-laminate or breakdown over time. In this case, water will be trapped in the system, which then leads to erosion or corrosion of the parts of the unit.

3. Issues with the water quality

The cooling tower could also experience poor water quality, which could be as a result of extreme corrosion of the interiors. If this happens, you will need to hire a contractor to replace the unit or fix it accordingly.

Maintenance tips for the cooling tower

- Conduct a regular chemical or water treatment to eliminate the contaminants and other corrosive elements in the unit.

- Clean and prevent the blocked spray nozzles. Ideally, install clog-free nozzles to fix this problem.
- Maintain an adequate airflow in the tower. Eliminate any debris that is at the outlets or inlet of the tower. Also, inspect the fan blades, fan pitch, and gearbox for any faults.
- Check that the pump performs perfectly. The best way to ensure this is by checking for clogged strainers, loose bearings/connections, faulty vibrations, and any other fault that could affect the water flow.
- Conduct a preventive-maintenance program regularly.
- Limit the water temperature that leaves the tower.
- Operate the cooling towers at the same time.

If the problem is overly complex, contact a professional for further assistance.

Cooling Tower Pumps

The pumps that serve the cooling towers might also be faulty, which then affects the entire cooling tower unit. The most common issue with the cooling tower pumps is the production of an unbearable noise.

The cooling tower pumps could give audible noises that sound like the pumping marbles. The problem here could be an induced draft or a forced draft cooling tower. Also, negative suction pressures can lead to the noises eliminated by the pump.

If the component is imbalanced, the components are rubbing on each other, the coupler is misaligned, or the base plate and motor are not installed properly, there can be a mechanical noise in the pump.

A liquid noise is caused by the movement of water in the pump. They will be caused by a flow separation, water hammer, cavitation, or turbulence energy due to a high flow velocity.

Tips to eliminate the noise issue

- Increase the liquid pressures to reduce flashing and decrease the suction lift. Here, you might have to lower the pump and raise the tower, or simply straighten the suction piping so as to limit the friction losses.
- Decrease or increase the pump speed to limit the system resonance of the liquid or mechanical noises.

- Inject a small amount of air into the centrifugal pump suction to provide a shock absorbing cushion and limit the cavitation noises.
- Adjust the pump to increase the clearance between the diffuser vanes/casing cutwater and the impeller diameter.
- Eliminate the vortexing in the tower pan. You can include a baffle assembly to get rid of the vortexes formation. Always contact a professional contractor in case you fail to solve the noises that come from the cooling tower pumps.

General HVAC Troubleshooting

The commercial HVAC systems will encounter the following problems:

1. Unpleasant odors or poor indoor air quality

If there is a bad smell or the air quality in the building is poor, there could be a problem with the filter or there might be a gas leak. A bad smell will be emitted when the parts of the unit overheat, the air filters are dirty, stagnant condensed water is in the unit, or melting debris get into the ductwork from the heat exchanger. Inspect the system and eliminate those common errors in the system as soon as possible. You can call a professional if you can't find the cause of the smell.

The IAQ can also be affected by a faulty damper, which should be checked several times throughout the year. The damper stops the compressor when the air temperature outside is lower than a specified point. When these dampers are not cleaned and perfectly lubricated, they tend to stick to each other. This then overloads the cooling coils and prevents the unit from cooling itself.

2. Imbalanced Airflow

In most cases, holes or cracks in the ductwork can lead to inconsistent temperature from one room to another. When the temperatures are variable, the system will require more energy to replace the lost airflow. This then leads to high energy bills.

Check for any cracks, sags, or separation in the ductwork to identify the cause of the leak. Suppose the ductwork is insulated, you can check for any dirty spot on the insulation. Ensure that the leaks are corrected as soon as you identify them. Since it might be challenging and difficult to spot a leakage in the ductwork, it is advised to contact an HVAC expert.

3. Inefficient system

A lot of people end up replacing the commercial HVAC unit when they realize any sign of inefficiency. Specialists point out that the efficiency of a commercial HVAC unit can be highly improved by cleaning the condenser and the evaporator coils. Ideally, ensure that the coils in the system are cleaned two times every year. This helps to eliminate any debris or dirty layer on the coils, which might reduce its performance.

4. Loud noises

The systems will give loud noises, if there is an imbalanced system, or if some elements are blocking the free flow of air and water inside the unit. A well-balanced pressure flow can help to get rid of the strange noises produced by the system.

Conclusion

Most of the commercial HVAC units work differently from the regular units used in houses. The reason for this is that the commercial units are designed to work for long hours and cover a bigger surface area or building. When the unit has various faults, it will affect the air quality in the building and also lead to high increased energy bills. If you do not find the solution when carrying out the HVAC troubleshooting, always call a professional for further help.

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