**A complimentary eBook courtesy of:**

# Conditioned Air®

## *A Guide to Help Keep Your Home's Air Cool, Clean, and Affordably Comfortable*

# Introduction

Heating and cooling your home uses more energy and drains more energy dollars than any other system in your home. Typically, 44% of your utility bill goes for heating and cooling.

No matter what kind of heating, ventilation, and air-conditioning system you have in your house, you can save money and increase comfort by properly maintaining and upgrading your equipment. But remember, an energy-efficient system alone will not have as great an impact on your energy bills as using the whole-house approach. By combining proper equipment maintenance and upgrades with appropriate insulation, weatherization, and thermostat settings, you can cut your energy bills dramatically.

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# How to Maintain your AC system for Peak Performance

Like an automobile, your AC system needs regular maintenance checks and tune-ups to keep it in top condition a performing at its best. Unfortunately, your AC system isn't going to tell you what needs to be done and when to do it, so here are a few pointers for keeping your air conditioner humming efficiently and affordably.

## Evaluate the health of your current AC system.

If you've moved into an older home with an existing air conditioning unit, check the age. To determine the age of your system, record the model and serial number of the outdoor condenser and contact your contractor. The age can be determined from this information. AC systems that are more than 10 years old are not equipped with modern energy-saving efficiencies. You have two options: Have the system professionally cleaned and tuned up to get the most out of the system you currently own; or upgrade your current system. If you choose to upgrade, you'll need a professional contractor to guide you - and even then, be sure to weigh out the cost/benefit and return on your investment by considering such things as: price, value, utility rates, payback period, warranty, etc. You may want to spend more up front to save more money in the coming years. If you've purchased a new home or one with an already upgraded AC system, ask for an operator's manual and be sure you have what you need to get the best performance.

## Schedule routine maintenance visits at least twice per year.

Routine maintenance is a good way to prevent problems and keep your system running at maximum efficiency. AC service and maintenance technicians are trained to identify potential problems and provide solutions.

# How to Maintain your AC system for Peak Performance

Although all manufacturers strongly recommend a regular maintenance plan for AC equipment, it is not often included with the purchase of your system. The equipment warranty only covers functional parts for a specified length of time. Failure to maintain your equipment may cause the condensate pan and drain to become clogged, resulting in water leakage and poor system performance and possibly void the warranty.

That's why an AC professional should perform a maintenance checkup on your system at least twice a year. Many companies offer affordable annual maintenance contracts so we can keep your AC equipment in top form all year long.

**A typical one-year two-visit maintenance agreement includes the following:**

- Two precision tune-ups and professional cleanings
- Clean outdoor coil
- Clean indoor coil if accessible
- Clean and flush condensate drain
- Measure superheat and subcool
- Replace filter media
- Check operating pressures
- Monitor starting capabilities
- Measure for proper temperature difference inside
- Check thermostat
- Tighten all electrical connections
- Monitor voltage and amperage of motors
- Provide a complete list of all procedures performed at each visit

# How to Maintain your AC system for Peak Performance

Many contractors provide other added benefits for customers who sign up for maintenance agreements, such as discounts on parts and labor, priority scheduling, and transferability.

Maintenance agreements typically do NOT include:

- Duct systems
- Supply and return grilles
- Replacement thermostats/humidistats, electronic air cleaners, specialty air filters, ultraviolet lights or repairs caused by rust or corrosion. (These can be added, just ask your provider)

On the other hand - for a very modest annual investment - a maintenance agreement includes:

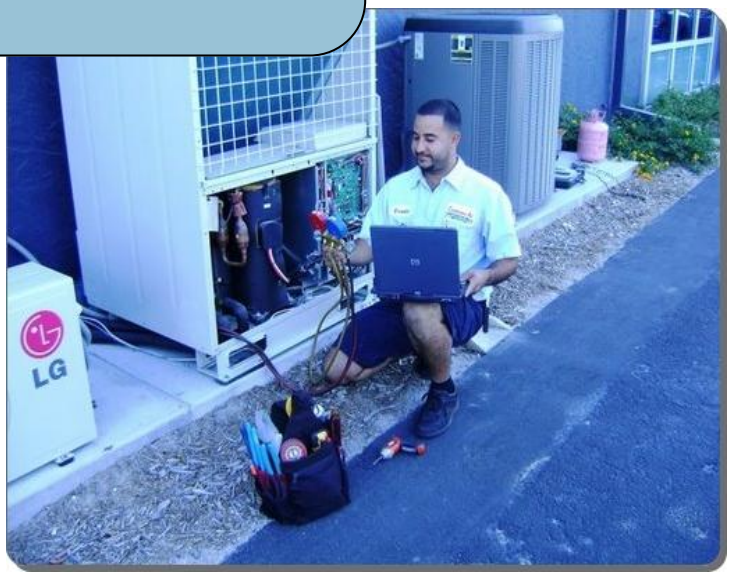
- Improved efficiency
- Extended equipment life
- Improved capacity
- Potential money savings of up to 3% to 8% on your utility bills

# How to Maintain your AC system for Peak Performance

**Be sure to clean or replace your filters frequently.**
Keeping your filter clean is one of the easiest ways to ensure truly efficient operation of your home cooling system. Manufacturers recommend cleaning or replacing filters two times per year, depending on run time. If you have dogs or cats, more than twice per year may be necessary. If you don't know the location of your filter, check with your AC contractor. He or she can also advise on the best type for your individual circumstances. Also keep in mind that some digital thermostats include a feature to remind you when your filters need to be replaced and when maintenance checkups are due to be scheduled.

## Best Practices

**Keep both your indoor and outdoor coils clean.**
You'll want a special evaporator coil cleaner for your interior unit and a solution of water and non-toxic, non-acidic cleaner on the exterior coil. Ask a professional contractor for help if you need it.




**Watch out for ice on the pipes at your evaporator coil.**
Ice is a sign of a potentially serious problem. Turn off your unit immediately and ask your AC company to send out a technician right away. Check both indoor and outdoor equipment for signs of ice buildup.

**Don't let plants and other obstructions block your condenser.**
Make sure you've got lots of air-flow around the unit. It's best to keep all vegetation a good 18 " away from the air conditioner. Don't put any kind of shed or building over your unit. Be sure to keep the indoor evaporator coil unobstructed as well.

# How to make every room equally comfortable

Every house is different, and each room has its quirks. It's not unusual to have hot or cold spots in a home - even in new construction. Homes that are built on a slab tend to be colder, while older two-story homes tend to be drafty downstairs and stuffy upstairs.

**Several things can cause a chronically hot or cold room, such as:**

- Position in the home (such as a room above a garage)
- Direction (for example, a south-facing room gets more sun and is likely to be warmer than a north-facing room)
- The number of air ducts in the room, and whether the ducts are insulated
- The number of windows and the direction that the windows face
- The size of the room and the height of the ceilings
- Inadequate ceiling insulation

**Just because a room tends to be warmer or colder doesn't mean you have to live with it as it is.**

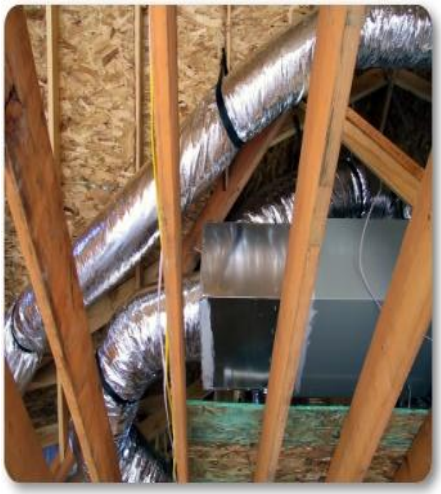
The most accurate way to know the room by room requirement for comfort is with a professionally done Heat Load. You have a number of free or affordable options to manipulate the temperature of each room to create an equally balanced and comfortable temperature throughout your home. Best of all, you can make a number of changes yourself without calling in a contractor. Even if you need to invest money to solve the problem, you can expect to recover it by making a significant dent in your home's energy costs.

# How to make every room equally comfortable

**Check and Improve Insulation**
Many homeowners discover that their inadequate attic insulation is a major cause of energy waste. You can lose as much as 40% of your cool air if your insulation is insufficient. Check to make sure that the attic area above every room in your home has the insulation it needs. Most experts recommend that you increase the R-11 to R-15 insulation that is typical of homes more than 10 years old to an energy-saving R-30 level.

**If a room is too hot or too cold...**

**Make Sure Your Ducts Are Correctly Installed and Insulated**



Check heating vents for obstruction and ducts for insulation (you may need to upgrade to insulated ducts to avoid losing heat through un-insulated ducts). Also, check to make sure that your duct seams are tightly sealed to keep cool air from vanishing into the attic. You may be losing 20% of the air that passes through your ductwork because of poor connections or poor insulation. This means that some rooms will be much harder to cool–- and that you will be spending a lot more for your monthly cooling bills.

**Check to See If You Have an Air Return in Each Room**
Many homes today rely on just one or two air returns to serve the entire home. This may work as long as no one shuts the door to their room. Closed doors may cut off the air supply and create a pressure imbalance that impedes your system's ability to cool every room effectively. A more efficient approach is to install a return air duct in each room that also has a supply duct.

# How to make every room equally comfortable

## If a room is too hot or too cold...

**Weatherization**
Check the windows for drafts. Check baseboards for cracks, chips or holes in the wood. A little caulk goes a long way to weatherize a room. If your home has hardwood floors, check for loose floor boards or gaps and have them repaired.

**Add or remove natural light**
If a room is too warm, consider room darkening window treatments or blinds to use when the sun is at its highest and hottest. If a room is too cold, remove window treatments or replace with lighter fabrics like sheers to let in natural light.

**Consult a professional HVAC contractor**
If your home has extraordinary variations in temperature, you may choose to save yourself a good deal of grief and elbow grease by calling in an expert to advise you on how to make each room - and your whole house - more comfortable and more energy efficient.

# How to keep your air clean and healthy year-round

Everyone benefits from an air conditioning system that cleans the air as it cools, especially allergy sufferers and people with respiratory problems. Mold, bacteria, pet dander, pollen and other pollutants all pass through your air filter. Choosing an air conditioning system or component that greatly improves your indoor air quality is something worth considering.

There are several AC components and systems designed to keep the air in your home clean and your family healthy and well.

**Dehumidifiers**


Controlling the amount of humidity inside your home is not only an important part of keeping your home cool and comfortable, it's a critical factor in your home's air quality. According to the Environmental Protection Agency, "By controlling the relative humidity level in a home, the growth of some sources of biologicals can be minimized. A relative humidity of 30-50 percent is generally recommended for homes. Standing water, water-damaged materials, or wet surfaces also serve as a breeding ground for mold, mildew, bacteria, and insects. House dust mites, the source of one of the most powerful biological allergens, grow in damp, warm environments."

Dehumidification takes place in your air conditioning system's indoor component, the air handler. Be sure the air handler is functioning properly by having a contractor take a look. In an extreme climate such as tropical Florida , you might want to consider augmenting your air handler's dehumidification capability with a supplemental whole house dehumidifier.

## How to keep your air clean and healthy year-round

# Air Filtration

You may be surprised to learn that new construction standards may lessen the quality of the air inside your house. Because of the way homes are built these days, with tighter seals to keep energy costs down by limiting the escape of "conditioned" air, the quality of the air inside your home is often worse than the air outside, especially in major cities. As the air inside your home is re-circulated, allergens, dust, mold, viruses and even odors can impact your health. Therefore, removing all those impurities has become a higher priority now more than ever. Have your air filters checked, cleaned or replaced often.

There are many options when it comes to filtration: simple media, thin pleated, wide pleated, and electronic. For an interactive demonstration of these various filters, please see the "How Everything Works" tab at the top of the Conditioned Air website. Click on Air Filtration under "Residential" and learn about the different benefits from each type of filter.

# How to keep your air clean and healthy year-round

## UV Lights

Ultraviolet light can be used effectively as a disinfectant by installing an ultraviolet air disinfection system in your central heating and air conditioning system. UV air disinfection equipment works by flooding an area of your HVAC system with UV light. As air circulates through the system, it is disinfected from the exposure to this UV light. This process rapidly and dramatically reduces airborne bacteria, viruses, and allergens. If installed in proximity to the indoor coil it can greatly improve the cleanliness of the coil.

## Water Protection

As your air handler performs its function of drawing air over the evaporator coils to cool it, it also removes humidity from the air. This process produces water which is collected in drain pans located within the air handler structure. Over time, these drain pans can become a source of mold and mildew, contaminating the air that is drawn through the air handler itself, introducing harmful allergens into the air you breathe. Problems can also occur if the drain pans overflow, leading to possible water damage in your home. Have the condensate drain pans cleaned regularly to maintain good air quality. Safety switches and water sensors can also be installed to help prevent overflows and water damage.

# How to know if you need to repair or replace your AC system

Sometimes it's not terribly obvious that your air conditioning system is functioning improperly. If it turns on and off and blows hot or cold air, you might not notice any problems. However, there are symptoms that you can see or hear that will help you identify issues before they worsen.

By calling for service as soon as you notice the symptoms of an ailing cooling system you can prevent the expense and inconvenience of a big repair job. You'll also avoid the higher utility bills that typically accompany a poorly functioning air conditioning system.

**Have your air conditioner checked by a professional contractor when you notice any of the following symptoms:**

- Decreased air flow from the registers
- Strange noises coming from the air conditioner
- Stale odors coming from the ductwork when the air conditioner is running
- The air conditioner cycles on and off more frequently than it used to
- The breaker for the air conditioner in the electrical panel keeps tripping (or the fuse keeps blowing)
- Ice appears on your air conditioner or piping, either inside or outside the house
- Outdoor air conditioner fan won't turn on

**If you notice any of these symptoms or anything else out of the ordinary, call a reliable contractor to assess the situation. Doing so will save you money in the long run.**

# How to select your next AC system for maximum efficiency and affordability

Follow these three simple steps to finding the right AC system for you:

**Step One**

## Perform a Heat Load Calculation on your current AC system

Have a contractor perform a Heat Load Calculation to determine how much heating or cooling power you need for your home. Be sure you use a reliable, professional, certified contactor. Some national surveys claim that well over half of all HVAC contractors do not size heating and cooling systems correctly.

Older systems (more than 10 years old) are often unreliable and much less efficient than a modern system. When it's time for a replacement, choosing one of the correct size (heating and/or cooling output) is critical to getting the best efficiency, comfort, and lowest maintenance and operating costs over the life of the new system.

Correct system sizing requires consideration of many more factors than simply reading the nameplate on the existing unit.

### Eight key factors for correctly sizing a heating and cooling system include:

- The local climate
- Size, shape, and orientation of the house
- Insulation levels
- Window area, location, and type
- Air infiltration rates
- The number and ages of occupants
- Occupant comfort preferences
- The types and efficiencies of lights and major home appliances (which give off heat)

# How to select your next AC system for maximum efficiency and affordability

Follow these three simple steps to finding the right AC system for you:

**Step Two**

## Determine how much you could save on energy costs. Consider an upgrade to a Higher efficiency (SEER) system

SEER stands for "Seasonal Energy Efficiency Ratio. This is a measure of the energy efficiency of the air conditioning system. SEER ratings allow consumers to compare operating costs of various cooling systems and products.

## Higher air conditioning SEER rating equals more efficiency

In other words, a higher SEER number means lower energy cost to cool the house. Older air conditioning systems - those installed prior to 1992 are likely to have a lower SEER (below 10) than a newer, more efficient system.

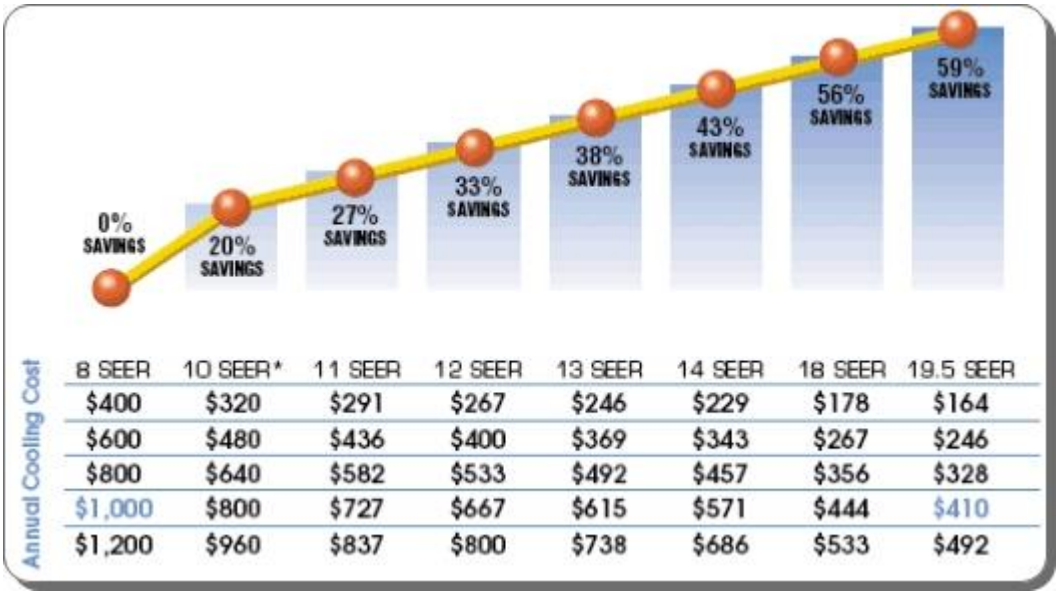
However, it's important to look beyond comparing SEER ratings, to maximize efficiency. If you examine the building insulation and air leakage as well as the layout, insulation, and adequacy of the air conditioning duct system, you will almost certainly be able to reduce the cost of operating your home air conditioning systems.

# How to select your next AC system for maximum efficiency and affordability

## How much money can you save by upgrading to a higher SEER system?

Find your systems current SEER on the chart below. Then go down to your current estimated annual cooling cost. By reading across the chart, you'll be able to see how much lower those cooling costs could be with a higher SEER system. For example, $600 a year with an 8 SEER system could be as low as $246 a year with a 19.5 SEER system. Conditioned Air can show you how to save every month with a new high efficiency air conditioner.

**Minimum efficiency established by the Department of Energy. Potential energy savings may vary depending on the home owners personal lifestyle, system settings, equipment maintenance, local climate, actual construction, and installation of equipment and duct systems.*




| Annual Cooling Cost | 8 SEER | 10 SEER* | 11 SEER | 12 SEER | 13 SEER | 14 SEER | 18 SEER | 19.5 SEER |
|---|---|---|---|---|---|---|---|---|
| | $400 | $320 | $291 | $267 | $246 | $229 | $178 | $164 |
| | $600 | $480 | $436 | $400 | $369 | $343 | $267 | $246 |
| | $800 | $640 | $582 | $533 | $492 | $457 | $356 | $328 |
| | $1,000 | $800 | $727 | $667 | $615 | $571 | $444 | $410 |
| | $1,200 | $960 | $837 | $800 | $738 | $686 | $533 | $492 |

**Click here** to use FPL's energy savings calculator to estimate how much you might save with a new high efficiency system.

# How to select your next AC system for maximum efficiency and affordability

## Don't forget Tax Credits on Home Energy Upgrades!

On February 17th, President Obama signed the **American Recovery and Reinvestment Act of 2009 (ARRA)** into law. ARRA is designed to increase the energy efficiency and performance of America 's homes and commercial buildings. The ARRA includes increased tax credits for 30% of the cost of qualifying improvements up to $1,500 for improvements installed between January 1, 2009 and December 31, 2010

For more information go to:

**Energy Star website:**
http://www.energystar.gov/index.cfm?c=products.pr_tax_credits

**Alliance to Save Energy website:**
http://ase.org/content/article/detail/2654

# How to select your next AC system for maximum efficiency and affordability

Follow these three simple steps to finding the right AC system for you:

## Step Three
## Consider the Environment.

A chemical compound known as R-22 has been the refrigerant of choice for residential heat pump and air conditioning systems for more than four decades. Unfortunately for the environment, releases of R-22 that result from system leaks contribute to ozone depletion. The air conditioning industry, therefore, has sought a suitable replacement. The replacement refrigerant of choice is R-410A. Unlike R-22, R-410A contains no chlorine in its chemical make-up. R-410A meets the stringent mandates of both the Montreal Protocol and the U.S. Environmental Protection Agency.

You probably don't know it, but you're likely using R-22 refrigerant in your current AC system. R-22 will be in production until 2020, so you don't need to make any drastic changes with your existing system; however, when you are ready to replace your current AC system with a new high efficiency alternative, R-410A will be the new equipment standard. By law, in 2010 and beyond, new equipment manufactured is mandated to be produced without R22.

# AC problem checklist

There are many variables in determining an air conditioning problem - many of which should be evaluated by a professional service technician - but here are a few basic problems and checkpoints to try before you call a contractor. If all else fails, however, a professional should be contacted for a service call.

**Too Little Air coming out of air ducts**

- Check the duct system for blocked ducts, loose leaky connections, closed dampers, crimps and bends
- Check the air blower and filter for dirt and debris
- Check air handler and evaporator coils for ice buildup

**Inadequate dehumidification**

- Check temperature controls to be sure temperature is dropping (even if humidity is still high)
- Check ductwork. Changes in the duct system, such as increasing the return air to the air handler from additional areas, can improve humidity levels.
- Unit is likely oversized for the space and should be replaced. Other options are to leave doors open to cool a larger space or add a secondary dehumidifier.

**Electrical Problems: AC system won't start**

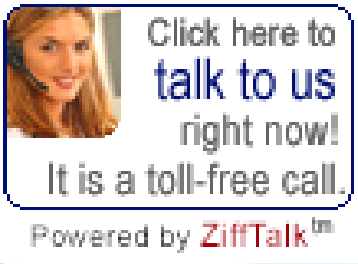
- Check that the AC is turned on, is set to "cool" and the temperature is set below
- ambient room temperature (It may sound silly, but we've all done it, so check these items first).
- Make sure both the outdoor compressor/condenser unit and the indoor blower fan/evaporator coil unit have electrical power.
- Check the air conditioning electrical wiring. Are they physically damaged or cut? Are the power switches on, are the fuses good, are the circuit breakers in the "on" position, and is the thermostat set correctly?

# How to get help right now - or when you need it

## Need help now?

For immediate help with your AC service equipment needs, call us at 239.643.2445. You can also get help by visiting us online: www.conditionedair.com

*You'll find the links below on every webpage for fast problem solving.*




Talk live with a Conditioned Air Service Expert via our website, 24/7.


Chat online with us during business hours. We'll get you to the right person for your AC needs.

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