

## Home Heating and Cooling

Homeowners know that a great deal of energy is required to power heating, ventilation and air conditioning (HVAC) systems, especially once winter or summer electric and gas bills arrive. In fact, as much as half of the energy used in a home goes towards heating and cooling the indoor environment.



The goal of an HVAC system, when operating properly, is to provide a temperate climate and the best possible air quality, delivered for an affordable price. Most homes today are equipped with central air and heating systems that maintain temperatures in all rooms of a home they service.

Whether a home is new or older, the heating and cooling equipment should always be sized to properly fit the home. Proper equipment sizing is determined by your home's heat loss during cold weather and heat gains during warm weather, and is calculated using a design load formula. To determine if an HVAC system is the right size, homeowners can do their own calculations using software found at the website [energystar.gov](http://energystar.gov).



A system that is properly sized will prove to be more cost-efficient than an oversized unit. A unit that is too large will constantly cycle on and off, raising energy costs. Undersized equipment, with airflow that is insufficient, will reduce the efficiency of the air distribution and speed up wear on system components, leading to inadequate room temperatures and equipment failure.

However, installing new equipment isn't always the answer when homeowners are looking to lower energy bills. Before an HVAC system needs to be replaced, it pays to review routine maintenance issues. One problem that can be remedied easily is stopping air leakage within the home or around air ducts. These leaks can be sources of problems rather than the HVAC equipment itself. The homeowner or a contractor can seal ducts and pipes by using mastic or metal-backed tape, or an aerosol-based sealer. Once any leaks have been sealed, the system can be checked for optimal air flow. When the air flows at proper levels, a home is comfortable and energy bills are more affordable. If air flow is too high, duct leakage increases and the temperature at the register is not sufficient for optimal home comfort. If air flow is too low, air distribution efficiency drops and accelerates the wear on system components, causing discomfort as well as premature failure of equipment.

There are a number of systems that can be checked when trouble-shooting HVAC systems. Thermostat settings can be adjusted to ensure comfort levels are maintained when family members are home and energy is conserved while they are away. Moving parts in the HVAC system can be lubricated for better operation and reduced electricity use. Evaporator and condenser air conditioning coils can be cleaned and air conditioner refrigerant levels can be checked and adjusted.



Homeowners also can extend the life of their system by staying on top of filter maintenance by inspecting, cleaning or changing filters at least once every three months. Filters should be changed monthly during the heavy-use summer and winter months. A dirty filter will slow down air flow and make the system work harder to keep family members warm or cool and that wastes energy. A clean filter will also prevent dust and dirt from building up in the system which could lead to expensive maintenance and/or early system failure. Routine maintenance can make a big difference in the life and effectiveness of an HVAC system, as well as the cost to maintain a comfortable and healthy home.