

LOG HOME LIVING

Indoor Climate Control Basics

By Jim Cooper/Loghome.com

The best way to ensure your comfort and budget — and to control heating and cooling costs — begins with attention to architectural design. It is essential to control solar gain while maximizing daylight and natural ventilation. Proper insulation and sealing your home will reduce the cost of the HVAC (heating, ventilation & air conditioning) system you need and the costs to operate it. Here are some tips when designing your HVAC needs.



Good planning. There are two types of design involved in planning for energy and air management: architectural and system. Architectural design concerns the floor plan, siting and materials, and methods used in building your home. System design concerns the selection and layout of the heating, cooling and ventilation system. Architects, log company designers and/or homeowners usually create the design for a log home, while HVAC system design is usually handled by an energy professional or HVAC contractor.

Early involvement. Bring the system designer in early to your architectural design process. This will allow them to make suggestions and advise you about the impact of some architectural features on cost and energy efficiency. Too often the HVAC contractor's first encounter with your home is when they show up at a dried-in log shell and have to explain that the system you want will require some demolition and re-framing to accommodate ducts and equipment.

Pick your fuel. Natural gas, propane, electricity and wood are the principles used to heat air directly as in a natural gas flame in a furnace, or indirectly as a flame in a boiler that heats water that is distributed to radiate heat throughout the house. The choice of fuels and the means of using them depend greatly on the climate and design of your home.

Generally, fossil fuels such as propane, natural gas and fuel oil are most efficient at operating boilers and furnaces. Electricity is generally less efficient and more costly. Wood generally works best as a supplemental heating fuel.

Figuring costs. There are two types of costs involved when planning an HVAC system. Installation cost includes the price of equipment and installation labor; operating costs include the ongoing costs of fuel and maintenance. The least expensive system to install may turn out to be the most costly to operate.

Firm up your choices. As soon as you know your general building location, consult with a home energy professional check www.energystar.gov and the local phone directory). You'll want to analyze your preliminary design and building site and discuss heating and cooling options. Once you have a fuel and system type in mind, contact HVAC contractors for bids and to discuss the practical issues of making your home HVAC-friendly, including any special framing requirements.

Log homes often present special challenges to HVAC installers. Large cathedral ceiling areas and exposed-beam floor systems often mean that there is no place to conceal ductwork or equipment. It may be necessary to consider some special-purpose systems such as ductless air conditioning and high-velocity heat pumps; other systems, such as wall-mounted furnaces or wood furnaces and boilers, can also be considered.

Final test. When your home is complete, have the energy professional conduct a blower door test to determine how well-sealed your home is. This test can point out areas where sealing isn't complete and will also tell you whether you should consider additional mechanical ventilation.

HVAC OPTIONS

Log homes can be heated and cooled by a variety of systems. Following are some of your options with cost and energy-efficiency considerations. Your location and situation will play major roles in selecting the right system for you.

Electric resistance. Electric resistance heat comes from passing an electric current through a resistant material that generates heat. Electric baseboard heat provides the least expensive heating system to install, but unless you live in a very mild climate or need to heat your home only occasionally, it is most costly to operate.

Forced-air furnace. These heat air using a flame or electric element and then use a large blower to push air through a system of ducts. In cold climates, a furnace fired by propane or natural gas may be the best solution. If summer temperatures call for occasional air conditioning, a separate cooling system can be installed that uses the same ductwork as the furnace.

Baseboard. Hot water baseboard heat relies on fluid heated in a boiler and then distributed to baseboard radiators located throughout the house. These systems are installed by plumbers and offer the advantage of allowing individual control of temperatures in rooms where the units are located. However, they do not include a duct system, so homes that also require central air conditioning will need to have separate ductwork installed.

Radiant. Radiant floor heat is carried through tubing laid in a concrete floor slab or below or within wood subflooring. It's more efficient than the convection heat that forced-air systems use. In a radiant heat installation, the entire floor slab becomes a giant radiator. Heat is transferred (radiated) to bodies near the floor. Radiant floor systems cost considerably more to install than heat pumps or forced-air furnaces.
