

# No Duct Work? No Problem!

custom solutions for homes without existing duct work



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Adding air conditioning to a home without existing duct work sounds like major renovation. Most people conjure images of open walls, dirt and dust along with a price tag that will blow the budget. Well, it isn't really all that bad. Contractors that specialize in the area of retro-fit air conditioning systems are usually capable of doing this kind of job in just a day or two and with very little mess. In the end, it isn't even noticeable that a major addition to the home took place.

We are going to examine the different types of homes that are often found built without air conditioning duct work and the different types of heating systems that exist in these homes. With this knowledge, we can create the best custom solution for each home situation.

First, let's consider a little history on what our builders were thinking when they built homes without air conditioning. It is somewhat amazing to think that just 20 years ago builders were only offering air conditioning as an option. Today, it would be unthinkable to build a new home without the comfort of central air conditioning. However, two decades ago, hundreds of these homes without air conditioning duct were built in our area alone. Back in the day, many people felt that they could live without the comfort of AC. Many were on a strict budget and first time home buyers found this type of electric baseboard home a perfect fit. And, if the temperatures became too much to bear, a window air conditioner costing a couple hundred bucks seemed like a reasonable and affordable solution.

Fast forward to the present day and we find that people are tired of loud, heavy

and unsightly air conditioners hanging from their windows. The appearance alone, greatly affects curb appeal as anyone who has tried to sell one of these homes has discovered.

The good news is for every dollar you spend having central air conditioning installed into your home, you can immediately tack that investment onto the price of the home if and when you decide to sell the property. So, now you are ready to increase the indoor climate comfort of your home and

increase its resale value by installing central air conditioning. In this article, we will primarily be looking at utilizing your attic space for these systems. For those of you with an open basement, you may have a second option.

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## Types of Existing Heating Systems

First we have electric baseboard heat. If this is the system you have and you are tired of spending big bucks to heat your home, you may want to consider a heat pump. Heat pumps that are installed as an added system may not be the absolute best type of heat. However, you can consider it as an air conditioning system with an added bonus of heat that will cost you 2/3 less than the existing electric baseboard as long as the average outside temperature is above 40 degrees. With anything below that, your cost of operation will just about equal that of electric baseboard. At these lower temperatures, it would be more cost effective to use your electric baseboard to heat your home as you are able to lower the thermostats in rooms that you use infrequently. My advice to owners of homes with electric baseboard who are adding a heat pump system would be not to disable or tear

out your electric baseboard but rather use it as a back up system.

In most cases, when adding a heat pump system to an existing home, we will begin installation in the attic. Most attics are wide open and provide great access to each room through the ceilings. This allows us to hide most of the system in a place that people seldom ever go. Consider having your installer put a central return in a hallway with a filter grille so that you will never need to go into the attic to change the filters.

All of your supplies can be installed in the ceiling, which is the best place for air conditioning. Although not the best scenario for heating, you can keep in



All photos courtesy of Vertex Mechanical

Refrigeration lines and wires that connect the air handler in the attic to the condensing unit outside are hidden inside a white downspout.

mind that this is an air conditioner with an added bonus of cost effective heating for slightly less temperate days.

Next we have (and what were they thinking), electric radiant ceiling heat. Although, electric ceiling heat is a radiant type of heat and can be very comfortable, it is expensive to operate and if you are sitting at your kitchen table, your legs will get cold because they are in the shadow of a table blocking heat from the radiant ceiling panel. You may want to consider a heat pump to offset those high utility bills during milder weather but please do not install the ceiling registers and cut into your radiant panel. When you do this, you have just disabled a great backup system. Most all heat pumps need to have a backup system in place and existing radiant ceiling heat will do nicely. In this situation, an installer should cut open the top of your wall from the attic and drop a register in the wall cavity. These systems usually are more labor intensive and do cost more but I would strongly caution against cutting a hole in the radiant panel and reattaching the cables to each other by soldering. Those cables are meant to be embedded in plaster and should not be used otherwise.

Hydronic baseboard, or hot water baseboard as it is better known, is one of the most comfortable types of heat. People who have it are reluctant to give it up. For these people, my recommendation for the addition of central air is to stick to an air conditioning only type of system. A redundant heat pump heating system will cost an additional \$700- \$800 and this type of heat is generally not enjoyed by people with existing hydronic heat.

To add central air conditioning to these types of homes, we will generally look at utilizing your attic space, even if you have a wide open basement. With this system you will have the best of both worlds. You will have a





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**V**ertex Mechanical Inc began in 2002 with the merger of two companies, Ray Youndt & Son Heating and Cooling and Robert E. Martin Electrical Contracting, combining over two decades of mechanical experience and excellence. Company President, Vincent Youndt leads a hands-on management team and expert technical crew, providing the best in mechanical design, installation and service.

Vertex specializes in custom solutions for homes without existing duct work, heat pump replacements and furnace upgrades. We will work with the homeowner to ensure that the system we offer will be energy and cost efficient while providing optimum comfort for their family.

heating system that is close to the floor raising heat up and an air conditioning system that pulls the heat off of the ceiling with a central return in the hall way and then dumps the cool air from a ceiling register, which will have a natural fall. This is a perfect system.

### Examining Home Types

For those of you that have rancher type (single floor level) homes, you are the lucky ones! Systems in these type of homes are the easiest to install and are usually the most cost effective. Easy accessibility helps keep labor cost to a

minimum.

Two story homes start to get a bit more complex in installation. The second floor is done much the same as a single story home, however to get to the first floor it is necessary to utilize the second floor closets in accessing the first story ceilings. Most installers will use a metal duct through the closets for added durability and for a cleaner look. Most will try to place it in a corner that will affect your closet space as little as possible. Again, if you are going with a heat pump, most likely your first floor



Above is a typical ranch style home without existing air conditioning or duct system. Left, a filter grille is being installed in a hallway for the central return. Filter grilles allow easy filter changes without needing to go into the attic.

will need some heating help via your existing system.

Bi-level homes usually install the same as a ranch home. In most cases, the lower level is mostly below ground level and the air conditioning will naturally fall to the lower level through the open foyer. In some cases we will not run any duct work to these levels to avoid over cooling these areas.

Cape Cod style homes are by far the most complex homes in which to install air conditioning however it is not impossible to do. If you have a knee wall that goes the length of the home, there is a very good chance you can have air conditioning installed.

### High vs. Low Pressure Systems

High pressure systems such as Unico or Space Pak are systems which utilize very small ducts and, thus, will require more of them. These systems work very well in applications where there is limited space for duct work however the equipment costs are much higher than a standard low pressure system and they are more expensive to service and maintain. This type of system should be used only if you have no other option.

Using a low pressure system is a more common way to install central air conditioning. These systems utilize a standard air handler and outdoor unit and are much more universal when it comes to service and maintenance.

### Efficiency Level Considerations

This is where the home owner needs to be educated and very careful. Do not pay for more SEER (Seasonal Energy



This is a typical installation into a home with ceiling cable heat. By using the wall cavity for the supply, the cable heat will stay intact for a redundant heating system and also will be utilized for the back up heat for the heat pump.

Below is a ceiling type register for a heat pump system. Notice that all the fins are adjustable, allowing the homeowner to direct heat flow to the floor level.



Efficiency Rating) than what you will see in energy cost payback over the expected life of your unit. Your contractor should be able to show you how much energy you will save on your individual house, not just some house on a graph (that is located most likely in Florida.) Most contractors do have the ability to do a cost of operation analysis which will show you how much energy your home will need. He can then show you the operation cost of a 13 SEER system and the cost of a high end 19 SEER system. Then you can make an educated decision on which system will best fit your needs. Here is an example of how such information can help you evaluate what type of unit is best. Consider a 2000 sq ft home that may cost \$200 per air conditioning season using a 13 SEER unit with an equipment expense of \$2500. The same home will save 6% in energy cost by going with a 15 SEER system but will cost you an additional \$1000 for the unit. In this

case you will save only \$12 per season. It would take over 83 years to make up for the additional expense of the higher end unit! The average life expectancy of a heat pump is 15 years. A reputable contractor will be able to help you determine which SEER will provide the best comfort and cost savings for your home.

If you have any questions, feel free to e-mail me at [vince@vertex-mechanical.com](mailto:vince@vertex-mechanical.com).

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