

Zoning Design and Application Guide

ZONEFIRST[®]

HVAC Zoning Systems

Table of Contents

| | |
|---|---|
| What is Zoning and Zone Control | 3 |
| Why Do You Need Zoning? | 3 |
| How Does Zoning Work? | 4 |
| How Do I Zone a System? | 5 |
| Zoning System Design | 5 |
| Zoning Heat Pumps | 6 |
| Zoning Variable Speed Equipment..... | 7 |
| Zoning Commercial Systems | 7 |
| Zoning vs. Multiple Units | 8 |
| Zoning Efficiency (and Downsizing)..... | 8 |

Enhancing Comfort.....Energy Efficiency.....Easing Installation

What is Zoning and Zone Control?

Zoning and Zone Control of Heating, Ventilating and Air Conditioning (HVAC) Systems are two ways of saying individual temperature control from one central HVAC System. Typically with almost all forced air systems there is only one thermostat to control the heating and cooling. Once that thermostat calls there is virtually no way to control the temperature in each room of the house except manually closing off the outlets in each room.

This manual method is time consuming and can cause harm to the HVAC Unit as closing off too many outlets can reduce the airflow in the HVAC severely shortening the life of the furnace, air conditioner or heat pump.

True zoning is a professionally installed zone control system consisting of a damper and thermostat for each room or zone of the house and wired into a central control panel that sequences each thermostat's call with the zone dampers in the ducts and the HVAC Unit. In some instances a by-pass damper or duct maybe required to relieve excess air when smaller zone(s) are the only ones calling.

Zoning can simply be related to having a light switch in every room of the house. You wouldn't install just one light switch to turn on and off all of the lights in the house....Would you? The same is true for heating and cooling. One thermostat turning on the heating or cooling for the entire house, when you only need a little in one room or zone is extremely wasteful. Also, why heat or cool rooms that may already be comfortable and air is needed in other portions of the house.

WHY DO YOU NEED ZONING?

If you are only living in or occupying one room or zone of your house, why heat or cool the entire house? Why you need Zoning is for the many benefits zoning provides.

ENHANCED COMFORT – One thermostat centrally located in a hallway, dining room or even the living room cannot properly control the temperature in any other area than the area nearest the thermostat. If you have a multi-level home it is very hard to control the temperature on the second floor when the thermostat is on the first floor.

There are many factors that affect the indoor temperature in your home. Outdoor conditions such as solar gain, wind chill, shading; building design such as large glass areas, cathedral ceilings, multi-levels, below grade rooms, sprawling ranch designs; and internal factors such as fireplaces, heat from lights, cooking, appliances, etc., all affect the temperature throughout the home.

Take for example the kitchen, the most widely variable temperature room in the house. In winter with cooking not much heating is needed, however in the summertime a lot of cooling is needed. Also rooms with fireplaces, and if there thermostat is located here, while a fire is burning the rest of the home can be very cold.

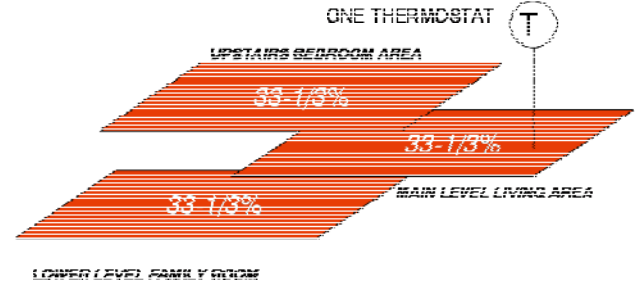
Zoning solves these problems by allowing de-centralized control and allowing each zones thermostat to make the demand instead of what's good for one has to be good for everyone.

Zoning improves the overall comfort by allowing the zone thermostats to react to changes in temperature in each zone. This prevents over heating or cooling some rooms while others rooms are under heated or cooled. Zoning provides perfect comfort, where and when you want.

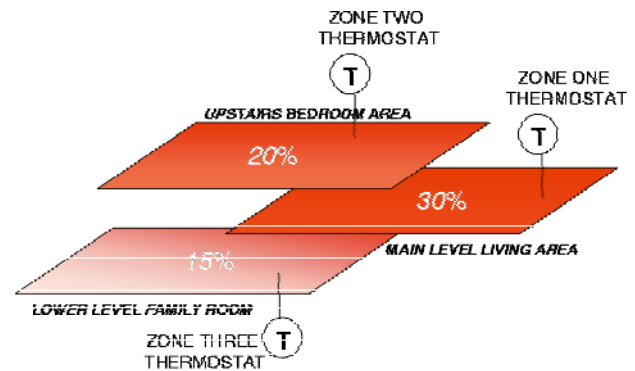
ENERGY EFFICIENCY – A zoning system delivers increased energy efficiency on any HVAC System. Zoning allows you to set back thermostats in zones not being used and prevents zones from being over heated or cooled while other zones are not yet comfortable.

Look at the illustration below showing one thermostat and a typical multi-level home. Each zone has an equal share of the energy bill.

However now add zoning and think of how often that zone is being used and how much energy can be saved by turning off the heating



and cooling to those zone when they are not being used. Or how much energy you're wasting because they are too hot or cold while others are yet to be comfortable. See below the possible savings.



Zoning savings have been achieved by many users of zoning systems. Actual results by homeowners have reported as much as 20% to 30% savings. These results in tests can be greater when combined with automatic setback thermostats achieving multiple setbacks per day.

Savings of zoning systems over single zone thermostat systems are well documented and even show a reduction in the number of cycles of the furnace and air conditioner. Reducing the cycles of any piece of equipment can extend its service life.

Zoning is not a new concept. Other forms of zoning have been used with hydronic heating systems for over 50 years, using zone valves or circulating pumps as their form of damper. In large commercial HVAC systems VAV (Variable Air Volume) systems are a more sophisticated form of zoning. Both hydronic and VAV zoning have proven similar 20% to 30% savings over single zone systems.

CONVENIENCE – A zoning system allows you to set the temperature in the room or zone you're in and not have to go to another area of the home to change the temperature. If you're in the bedroom at night ready to go to bed, you can adjust the temperature you want right there without having to go to the living room or some other area. You can then rest assured that you are only conditioning your bedroom zone and not all other areas of the home. You also don't have to guess at what temperature it has to be in the living room in order for you to be comfortable in the bedroom or go around closing off outlets to make sure more air gets pumped into the bedroom.

HOW DOES ZONING WORK?

Zoning is a simple product and concept. As you have no doubt realized by now that zoning provides the ability to only condition those rooms that need heating or cooling and does not allow conditioned air into those zones not requiring it.

Zoning does this through a series of components. The first being motorized dampers that open and close based on the demands of the zone thermostats. These dampers insert into the ducts or can be

installed at the air outlet for each room or zone. Multiple dampers can be controlled together for a single zone if multiple ducts serve a single room or zone. manufactures a series of damper controls to control every type of duct and outlet.

The next key components are the zone thermostats. The ZONEFIRST™ Systems use any standard heating and cooling thermostat. In existing homes the existing thermostat can be used as a zone thermostat. ZONEFIRST Zoning Systems are compatible with all standard 4 wire and heat pump thermostats. As each zone is divided, each zone uses a thermostat to control the heating, cooling and fan operation for its individual zone.

The zone thermostats and dampers are wired into a central control panel. This panel requires a separate 24 Volt transformer to power the panel, dampers and thermostats. The panel then also connects to the thermostat connections on the HVAC Unit. Instead of using one central thermostat, the MasterZone control panel allows the unit to be controlled by multiple thermostats.

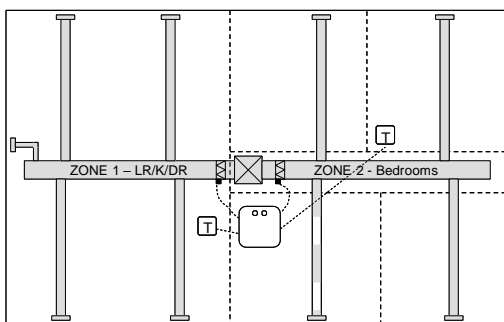
As each thermostat calls, be it for heating or cooling, the panel takes the first call from any zone. If it is heating it will keep open the damper to the calling zone, close the dampers to satisfied zones not calling for heating, activates the furnace or heat pump and begin supplying air only to that zone. If during this call other zones call for heating those zone dampers would open and heated air would be supplied to those zones as well. Once all heating calls are satisfied the panel will shut off the furnace or heat pump. The panel will enter a purge mode to direct the excess heated air to the last zone(s) calling. Once this purge mode is over the panel will see what other calls exist. During that time other heating or cooling calls can be made and the panel will then enter the next calls, operate the appropriate equipment and cycle the dampers open to only those zones calling and close the dampers to the zones that are satisfied.

In some instances a separate by-pass damper is installed to relieve any excess air from zones that are open and maybe too small to handle the full capacity of the blower. This air is typically by-pass into the return air duct or into a common area such as a hallway. When air is by-passed into the return air duct capacity controls for both the heating and cooling are also used to prevent overheating or overcooling in the unit.

HOW DO I ZONE A SYSTEM?

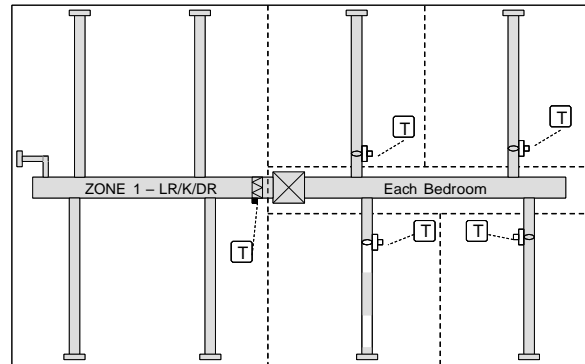
When zoning any system one must look at a practical cost effective number of zones for the home or office building. Most homes are typically two to four zones. Offices can almost be any number of zones depending upon the size of the building.

Most commonly a home is at least 2 zones, those being the living room, kitchen on one zone and the bedrooms, bathrooms on the second zone. Many other ways of zoning are by levels here each floor is a zone, or by occupancy and use or by exposures. Here's a typical 2 zone single level home zoning bedrooms and living areas.



As the home gets larger the need for zoning increases and typically many newer homes may have a zone for the formal living room and dining room, a second for the back kitchen and family room, and a

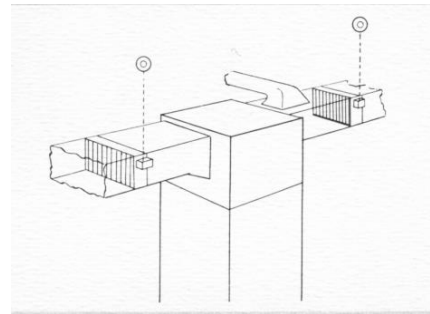
third for the upstairs bedrooms. Possible others would be to split the master and guest bedroom and the kid's bedrooms. Another maybe even still be the basement recreation room. The possibilities are many and it all comes down to the comfort level and convenience one want to achieve, keeping in mind the cost associated with adding each zone. Below is the same home however showing a zone for each bedroom.



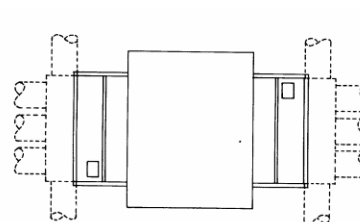
Any homeowner looking for a new home or looking to upgrade the existing HVAC should at minimum consider at least two zones between the living zone and bedroom zones.

Zoning any system requires a little thought and sometimes imagination and creativity. Every new home has the ability to be zoned, since zoning can be designed into the construction. Existing homes adding zoning can take some creativity and imagination in order to adjust to the existing ductwork. Depending upon the duct layout in-line dampers may not be able to be used and motorized registers or diffusers can be used to control the outlets. However one must always consider the cost of going with several motorized registers or diffusers versus the possibility of modifying the ductwork in order to use one in-line damper. Wiring is the other obstacle, especially in retrofit systems. However with the coming of wireless thermostats this makes installing zoning that much easier.

Here are some different duct layouts for different types of applications.

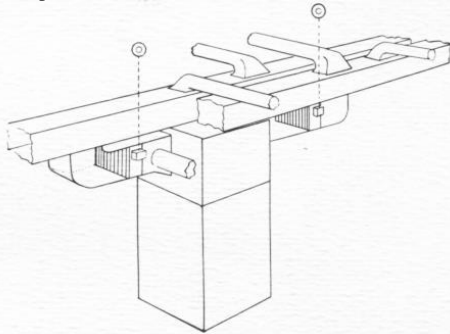


Above is shown a simple two zone system that can be split upstairs/downstairs or living area/bedroom area. The round take-off duct would be the by-pass ducted back to the return or a dump zone to a non-critical area.

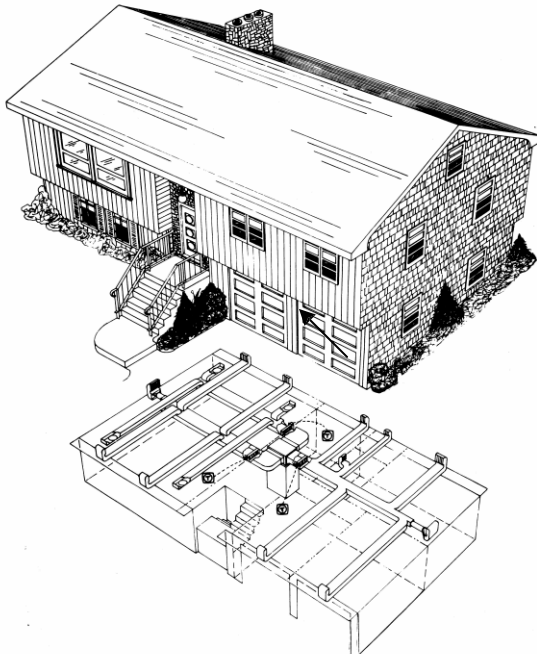


On the right is a two zone system with multiple take-offs on each zone. This illustrates using a zone damper to control more than one outlet vs. using multiple dampers.

Below illustrates a two zone system where the take-off ducts run in several directions and the zone dampers feed from the bottom of the separate zone ducts.

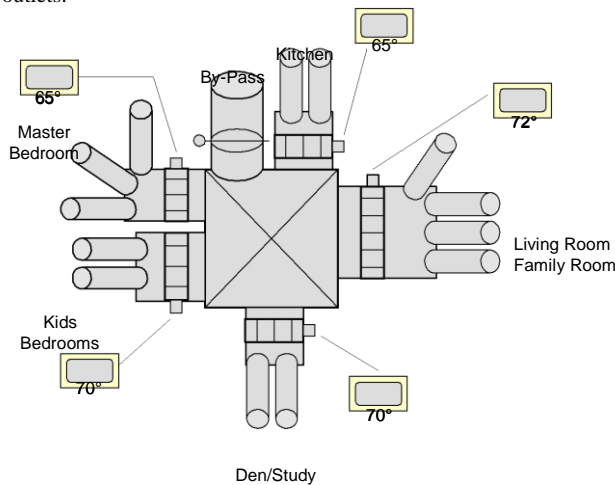


Below is shown a three zone bi-level type home where each living area is a zone. The main level is split between the Living Room and Kitchen Zone and the Bedroom Zone over the garage. The lower level Family Room is a third zone.



Above is the same split-level home however with each bedroom as an individual zone as well as the kitchen. The kitchen is one of the most highly variable temperature rooms in the home requiring not much heating in the winter but a lot of cooling during the summer.

Below is a typical radial duct system that may be a single level ranch type home or an overhead system with five zones using small extended plenums each with a zone damper to control multiple outlets.



ZONING SYSTEM DESIGN

Zoning any forced air system is easy once you know a few of the basic rules. The main consideration is to maintain a constant amount of air flow (CFM) through the HVAC Unit. This needs to occur when only one zone is open and if the zones are of varying size, when the smallest zone is open. The other consideration is not to oversize a duct system too much in order to maintain adequate velocity and airflow when all zones are open and may be calling for conditioning on those design temperature days.

The design of the duct system for today's zoning is an important factor to a comfortable and efficient zoning system. The number of zones, along with their size, often determine the best type of design.

There are scenarios for zoning. The first, which is typically on new installations of where the duct work can be designed for zoning would be to oversize the ducts for each zone in order to get more air to the zone when it may be the only one calling. The scenario for all others would be to use a by-pass damper to relieve the excess air pressure in the duct system when a minority number of zones are calling.

In new installations where ducts are being added it is recommended to size each zone duct the same and to size the duct for approximately 2/3 of the total HVAC System CFM. This is practical on systems with 2 or 3 zones and when all zones are approximately equal in size. This is NOT practical in an installation where 80% of conditioned area is one zone and 20% is the other zone.



The reason for each zone duct being the same size is that any zone could be the only zone calling and therefore that zone must handle the CFM of the HVAC Unit. When the duct is sized for 2/3 of the total CFM the smaller size does restrict the airflow and forces the air at a higher pressure and velocity, however it does not increase the air typically over that static pressure rating of the blower motor, usually 0.5" W.C. This also keeps the air velocity from being noticeably noisy. Below is a quick guide to determine the minimum equivalent size of a zone duct for each size HVAC Unit.

| <u>System CFM</u> | <u>Zone Duct</u> | <u>Branch Ducts</u> |
|-------------------|------------------|---------------------|
| 800 CFM | 12"x8"/12"Ø | 5-6" Rounds |
| 1,000 CFM | 14"x8"/12"Ø | 5-6" Rounds |
| 1,200 CFM | 16"x8"/14"Ø | 6-6" Rounds |
| 1,400 CFM | 18"x8"/14"Ø | 5-7" Rounds |
| 1,600 CFM | 20"x8"/16"Ø | 5-7" Rounds |
| 2,000 CFM | 22"x8"/18"Ø | 5-8" Rounds |

Systems over 5 Tons typically are commercial and would use a by-pass damper to relieve the excess air pressure when the majority of zones shut down.

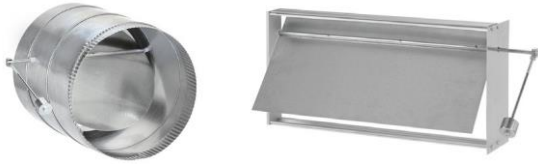
In retrofit and systems with 4 zones or more, over sizing the ducts is not practical. In these instances a by-pass damper is used to relieve the excess air back into the return air duct or dump the air into a central area of the building, such as a hallway, where often there is a

common return. In this instance try to locate the by-pass air as far away from the return air intake as possible.

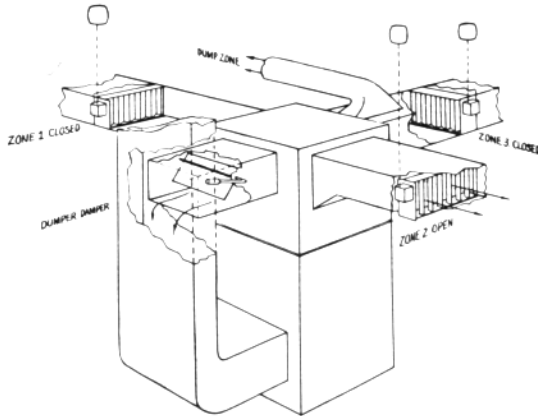
The key to a good zoning system is to deliver the conditioned air to the calling zone as fast and quietly as possible in order to satisfy the demand. Whatever air cannot be directed into the zone must then be by-passed. This develops the formula for calculating the size of the by-pass damper.

$$\text{Total CFM} - \text{Smallest Zone CFM} = \text{By-Pass CFM}$$

Once the amount of by-pass air is known it is just common sense to size a duct adequately to handle the amount of air. ZONEFIRST has both round and rectangular/square by-pass damper sizes.



IMPORTANT: When by-passing air into the return air duct it is imperative that capacity controls such as the AFC or Leaving Air™ Sensor be used in order to protect the HVAC equipment from freezing, overheating or pressure limits on the compressor.



The diagram above shows a typical three zone damper system with a barometric by-pass, Model SPRD, between the supply air and return air duct. A round take-off is also shown as an uncontrolled dump zone delivering air continuously to a non-critical temperature area, such as a basement or hallway as another method of relieving excess air. Either a by-pass or a dump zone is used but rarely ever is there a need for both.

MINIMUM POSITION DAMPER

Another form of by-pass is using minimum position dampers, such as the ZD and RDS dampers. Setting the larger zone dampers to a minimum position can also be a method of relieving excess air pressure. This should be used when only small amounts of air need to be by-passed as the minimum position air in some cases can cause a zone to overshoot its comfort zone. Caution must be exercised when using minimum position dampers for by-pass.

ZONING HEAT PUMPS

Heat Pumps are a very popular form of heating and cooling in the milder climates of the country. These efficient units use the compressor for both heating and cooling and have a reversing valve that reverse the flow of refrigerant in order to switch between heating and cooling modes.

Heat pumps, while very efficient, are also most efficient in milder climates where often there is more of a cooling demand than a heating demand, such as the southern United States. A heat pump is also rated based upon its cooling capacity and not the heating

capacity and rely typically on electric resistance heating to supplement the heat pump in colder weather, often less than 35°F to 40°F. When this back-up form of heat is used to supplement the heat pump compressor, the cost to heat the home rises dramatically.

It is this reason that zoning should be installed with every heat pump. ZONEFIRST has been zoning heat pumps for over 25 years and making homes with zoning and heat pumps the most efficient and affordable homes on the block.

Heat pumps with their limited capacity for heating cannot afford to be run on the colder climates heating the entire home or building. However if the heat pump is zoned, most likely less than the total building requires heat at any one time. The zone calling typically requires less than the total BTU capacity of the heat pump, more evenly matching the heat pumps capacity to the load of the calling zone. By doing so this lessens the need for the supplemental heat to come on, therefore providing substantial energy savings.

For example, a typical home may have a 3 Ton (36,000 BTU) heat pump. The total heating load for the home at heating design temperature maybe 60,000 BTUs or even more. Obviously with only 36,000 BTUs the heat pump can never keep up at design temperatures. However during milder temperature days, those above 45°F, the heat pump will often be more than adequate.

Heat pumps most efficient outdoor temperature, typically 45°F to 50°F and the amount of BTUs produced by the heat pump decreases as the temperature moves further below this temperature. This is when the supplemental electric resistance heat is often needed. As the heat pump compressor heats the air, the electric resistance heaters, located downstream of the heat pump coil, can come on to supplement the heat pump air. However if the system is zoned and heating is required for typically only one room or zone, the capacity of the heat maybe equal to or greater than the heating load of that zone and even as the output of the heat pump diminishes as the outdoor temperature falls, the capacity of the heat pump, (BTU output) is adequate for the zone(s) calling therefore not requiring the use of the supplemental heating.

The combined use of zoning and heat pumps allows more equally matched capacity to match the load of those zones calling allowing the most efficient form of heating to be used. Even during the colder times when the supplemental electric heat is needed, it is important to remember that a smaller amount of heating is always required for one room or zone vs. the whole house. Zoning allows the heating to be directed only to those areas needing it.

Fossil Fuel Furnaces and Add-On Heat Pumps

When a heat pump is added on to a fossil fuel (gas or oil) furnace, the sequence of operation is somewhat different that using electric resistance heating as supplemental heating. The heat pump coil is often on the supply side of the furnace and both the heat pump and furnace cannot be run together as the high temperature from the furnace will damage the heat pump compressor.

All heat pump manufacturers use a fossil fuel kit in order to make the most effective use of the heat pump and furnace. Simply this fossil fuel kit uses an outdoor thermostat to switch between the heat pump and furnace based upon the outdoor temperature or balance point. The balance point is calculated to determine the most effective temperature to operate the heat pump vs. the furnace. See the heat pump manufacturer's information to calculate the balance point.

When using a ZONEFIRST System with an add-on heat pump it is recommended to use the manufacturer's fossil fuel kit in order maintain the manufacturer's warranty. The zone control panel equipment terminal block will be wired to the thermostat connections on the fossil fuel kit.

When using any heat pump it is important to remember that with a limited amount of heating capacity, ZONING is imperative in order to make maximum use of the heat pump and where the individual zone load is more closely matched to the capacity of the heat pump.

ZONING VARIABLE SPEED HVAC

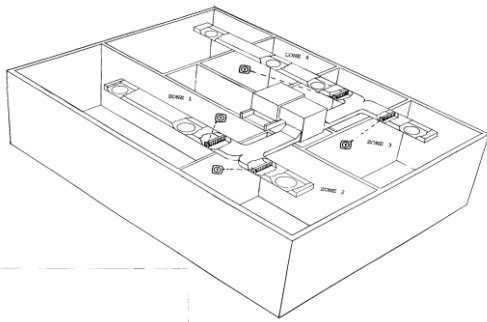
Zoning is a must with the new higher efficiency and variable speed equipment. The only change for variable speed equipment is to use a Static Pressure Switch, Model SPS, and a motorized modulating damper, either the ZDM (square/rectangular) or RDM (round) damper. This will cost a little more than a barometric by-pass, however can save time setting up the zoning system.

When only a small number of zones calls the variable speed unit will ramp up seeing the pressure restriction in the zone dampers. The motorized by-pass damper and static pressure switch will see this rise in static and quickly open the by-pass damper to respond to the increased air movement. As the by-pass opens the variable speed fan will slow seeing the reduced static and keep the air volume and noise from being too drafty or noisy.

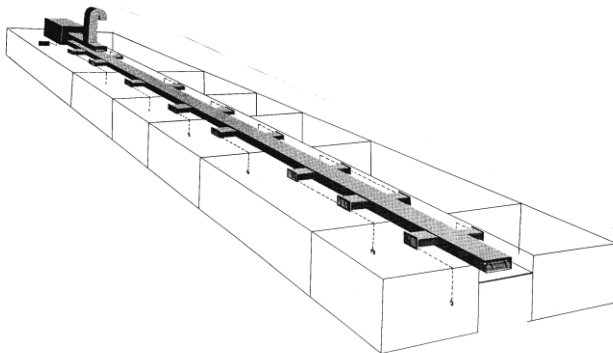
ZONING COMMERCIAL SYSTEMS

Zoning for commercial and light commercial office buildings makes even more sense as every person has their own idea of their own comfort level. The number 1 and 2 complaints in any office is its either TOO HOT or its TOO COLD. Being able to provide each office with its own thermostat to control the temperature is a simple and cost effective way to solve this problem.

Here is a small professional office with 4 zones. One zone would be the waiting room, reception area, another be the receptionist's office, another be the boss's/doctor's office, or conference room and the other smaller rooms be offices or examining rooms all on the same zone.



In commercial buildings they need for zoning is every increased by the building exposure when offices facing south and north are controlled by the same thermostats. Those south facing offices on a bright sunny day may be needing cooling while offices on the northern side with no solar gain still need heating. In the morning the entire building may need heating for a morning warm up and soon after only the perimeter offices need heating while the interior core needs cooling. Conference rooms that go for hours unused can be shut off and then when there is a meeting and the offices are not being used, the conference room can be controlled comfortably by having its own thermostat.



ZONEFIRST Zoning Systems can automatically direct the flow of the conditioned air to those zones needing it and automatically switch over and provide the opposite mode to the other zones eliminating

the need for on site techs to constant balance and adjust outlets based upon the ever changing conditions.

Light Commercial and Commercial systems are basically just bigger residential systems with more capacity. Duct design for these will almost always include a by-pass system, especially those over two to three zones. The commercial systems are easier to retrofit as the false ceiling space is often used as a common return and a great place to by-pass the air. Wiring is a snap as well as damper installation all taking place in the false ceiling.

Zoning also helps the landlord in tenant improvement costs by eliminating the need to add separate air conditioning units in order to satisfy multiple tenants on one HVAC system. While one tenant in a professional suite maybe an attorney and have more normal working hours, the doctor and dentist with after hours patients on evenings and Saturdays can still get conditioning by having their own temperature control.

Commercially, zoning is a very economical alternative to the more sophisticated VAV and computer controlled HVAC systems. Zone Control in commercial buildings can range from installing a single motorized damper and thermostat to control an over-conditioned or seldom used room or office; such as a conference/training room to zoning every room on the HVAC System.

There is really little difference in zoning a residential 5 Ton Split HVAC System and a commercial 5, 7-1/2, 10, 15 or 20 Ton Package Rooftop HVAC Unit. The system components of the dampers, thermostats and control panel can be the same in many instances. The only difference is the commercial rooftop maybe 2 stage heating and/or cooling and there may be more zones and the duct sizes may be larger, however the basic operation remains the same.

The Number 1 and 2 complaints in office buildings are people are either Too HOT....or Too COLD. Zoning is the less expensive alternative to the more commercially used VAV Systems and provides just as good temperature control as those expensive system for a fraction of the cost.

The design of a commercial zoning is also the same as a residential system where a by-pass is most typically used. Small commercial systems that may be just two zones might be able to get away without a by-pass provided they are only two zones and the ducts for each zone are large enough to handle 60% to 70% of the total airflow.

Commercial zoning systems of three zones or more will need a by-pass. The by-pass for commercial is often easier as many times the false ceiling space is used as a common return. Here again it is always important for the by-pass damper to be located as far away from the blower as possible. Barometric by-pass dampers can be used up to 7.5 Tons (3,000CFM). Over 10 Tons (4,000 CFM) should use a motorized by-pass and a static pressure control.

ZONING versus MULTIPLE UNITS

For years many HVAC Installers and Home Builders have used multiple HVAC units in order to accomplish zoning. Installing a unit for the upstairs and another for the downstairs is typically most common. While affective to achieve zoning, using multiple units is often an unnecessary and substantially higher added cost.

There are good reasons for using multiple units. They would be that the load of the home is so big that multiple units are needed. Homes continue to grow in size and on average homes over 3,000 square feet will typically require more than 5 Tons of cooling. In these larger homes, multiple units are necessary. Typically trying to use one central unit also creates long duct runs that may not properly get the airflow to all areas. Using multiple smaller units can be more effective however in these instances a zoning system should still be looked at as each smaller unit could still be subdivided into small zones.

The case for multiple units is also used in existing homes where add-on air conditioning may be installed and duct work cannot be run throughout the house. Example a older home without ductwork, that may utilize steam or hot water heating and air conditioning is being added. In order to add central air conditioning for both levels ductwork cannot be run from the basement to the second floor or from the attic down to the first floor.

However when two units are installed side by side in the same area and both units add up to less than 6 Tons, this is the case for using one unit and zoning.

Anytime a contractor can install one unit versus two, or more, the homeowner wins. Maintenance costs are cut with every unit saved. Remember the maintenance of air filters, electronic air cleaners, humidifiers, electrical requirements and the life expectancy of these HVAC units as well, are unnecessary added costs that can be saved by using one unit and zoning.

Another reason for using one larger unit with zoning is to economically obtain zoning and the highest efficiency HVAC equipment. Often when multiple HVAC units are installed these units are typically on the lower scale of efficiency. For heating this is an 80% efficient furnace. For cooling this is a 10 SEER air conditioning unit.

ZONING EFFICIENCY and Downsizing

The standard way of not living in your whole house all of the time and mostly occupying one zone of the home at a time proves the need for zoning. Zoning makes the use of the heating and cooling more effective by only conditioning those zones being occupied or that may need it. Therefore typically the majority of the time, even on a two zone system only one zone is typically calling.

When this occurs the furnace and air conditioner is oversized in BTU capacity when supplying only a single zone. Due to this many HVAC Installers will downsize the heating and/or cooling units based upon the use of zoning. On a two zone system this many not be recommended, however when using 3 or more zones it is practical to downsize to the next lower capacity unit.

An HVAC Unit should be sized to heat and cool the home at design temperatures (the hottest days in summer and the coldest days in winter). Realistically how often do design conditions occur. Of course this depends upon where you live. In the milder climates downsizing is much more of a possibility than in the severe heating climates of Northern states or the southern cooling climates.

HVAC installers have been quite successful in going to the next smaller size unit when using zoning. In many cases heating and cooling units are often oversized, especially on older homes. Doing a heat loss and heat gain calculation is very important in determining the size of the heating and cooling unit. Once the loads are determined for the overall structure, the affect that zoning will have on the overall load can be determined. Seldom used zones such as basements or extra bedroom loads can be looked at as not always needing conditioning at the same time as more often used zones. In instances where 3 or more zones are used may be advantageous to downsize to the next smaller size of heating and cooling unit.

NOTE: There are times during extended periods at design temperatures where will take longer for the zones to satisfy as the heating or cooling. It is important to note that some zones would have to be adjusted in order to direct more BTUs to the more important zones.

Down sizing while also increasing efficiency is often the best way to go. When considering the alternative of using 2 separate lower efficiency units in order to zone vs. one high efficiency unit with zone damper system, the cost difference is negligible if not sometimes less. Take for example the following scenario and price out the costs comparison of the example below.

| | |
|-----------------------------------|------------------------------|
| A 100,000BTU Home with 2 Zones. | |
| Two Units @ 80% Efficiency | vs. One Zoned 90% Efficiency |
| 2Units | 1 Unit |
| x 50,000 BTU Each (100,000 Total) | x 90,000 BTU (Downsized) |
| <u>x .8 (80% Efficiency)</u> | <u>x .9 (90% Efficiency)</u> |
| = 80,000BTU | = 81,000BTU |

When you look at the two options you can still get more output, with higher efficiency and still provide zoning. Combine this with the potential utility rebates for the higher efficiency and that often offsets the added cost of the zoning system. Even going to one 80,000BTU, 90% efficiency unit will only decrease the total output by 10% . In milder climates this can be an approach to lower HVAC installed costs when quoting against the competition with 2 lower efficiency units.

Applying higher efficiency and zoning to cooling can also increase the effectiveness of the cooling. Here again if utility rebates are offered for the higher efficiency this can further offset the added cost of zoning and possibly add other comfort options.

Typically the more zones you have the wider the diversity in the use of the zones. This factor can help in downsizing the unit. Take for example an exercise room that may only be used a hour or two a day. The family recreation room that is only used for a few hours in the evening and not when all are sleeping in the bedrooms or eating in the kitchen dining room zones.

Zoning and high efficiency equipment can increase the overall energy performance of your home and keep rising energy costs down to manageable level.

TECHNICAL SUPPORT and HELP

At ZONEFIRST, we make zoning easy. We started zoning forced air heating and cooling systems in the early 1960s, long before anyone ever thought you could. It is only relatively recently that the major OEMs have decided to adopt zone damper systems that more and more companies have entered the zoning market. ZONEFIRST has had a role in helping several companies enter the zoning business.

It has been our market and product knowledge over the years that have set ZONEFIRST apart from the others. Let ZONEFIRST help you to start installing forced air zoning on every new and retrofit installation of HVAC Systems. You'll be providing a benefit to your customer, differentiating yourself from the competition and profiting because of your knowledge and expertise in providing Room by Room Comfort.

ZONEFIRST offers several methods of support for the installing contractor through training materials, schools through your local distributors; on-site training; our website and our

Toll Free Zoning Answer Man at:

1-877-FIRSTZONE
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