

Multifamily Facility Management Services

SMALL COMMERCIAL AIR BALANCING

Description:

Many commercial buildings have heating and/or air conditioning delivered through ductwork. The heating source for such a system may be one of a number of equipment options including a rooftop unit, a duct furnace, or a heating coil through which boiler water or steam is circulated. The cooling source may also be one of a variety of equipment options, including a rooftop unit, a chiller, or a split system with a separate cooling coil.

One of the common complaints in a small commercial building with ductwork distribution is uneven heating. Uneven heating results from many things, but two causes are most common. One is differences in the distance from the heating source to the delivery outlet for various spaces. The other is re-configuration of the space inside commercial buildings in such a way that registers are no longer distributed appropriately.

Commercial air distribution systems are almost always equipped with some means of balancing the dispersal of heating/cooling air into the spaces, but quite often these systems are not being used properly or at all. Proper balance of the heating system in a building is essential to the efficient operation of its heating/cooling system, as well as to the comfort of its occupants. In fact, balancing the system often enables thermostats to be set at more economical settings, resulting in substantial cost savings.

In most ducted systems, the three steps described below can properly balance the heating and cooling in a building:

1. simple duct maintenance
2. proper adjustment of registers at each delivery outlet
3. installation and/or proper adjustment of in-line duct dampers.

Simple duct maintenance should always be the initial step in balancing any system. It is also one of the more important steps. Maintenance should include the regular inspection and replacement of any filters in the system, as well as the proper cleaning of grills, registers, louvers and fan blades to make sure that air will flow freely to the places it is required. In addition, any leaks in the air ducts themselves should be sealed with caulking or duct tape.

Proper adjustment of the louvered registers at each delivery outlet is a second step to proper air balancing. These registers can usually be adjusted by moving a mechanism, such as a lever, chain, or slotted screw. Sometimes the louvers themselves must be moved. This adjustment will control the flow of heated or cooled air into the room, increasing or decreasing it according to individual needs. Generally, registers farther from the circulating fan or main heating or cooling unit should be more fully open than those nearer the source of heat or cold.

Exclusive use of these louvered registers to balance air flow has only limited benefit. As a result, a lot of ducted systems also have dampers installed right in the ductwork itself (typically at points where the ductwork branches off from the main supply trunk). These dampers can usually be adjusted with a lever or a screw located right on the side of the duct where the damper is situated. The range of adjustment on these dampers is full open to full closed. Since these in-line dampers give the operator the ability to more precisely direct the flow of air within the system, they are one of the most useful tools in air balancing. As a result, if a particular system does not already have them, it may be worth installing them.

How to Implement:

If a particular area of the building is too hot or too cold, making adjustments to balance the distribution system will often solve the problem. Regular maintenance of the ductwork and simple adjustments to registers or dampers in the ductwork can often be completed by trained building maintenance staff. However, a certain amount of patience and some trial-and-error will be required in order to find the best adjustments, particularly for in-line dampers.

Some systems are too complex to balance without some guidance. If a system falls into this category, a heating and air conditioning contractor familiar with commercial systems should be hired to complete the job. In these cases, the contractor should use specialized instruments to check air flows throughout the entire system. Based on the results of these tests, the contractor will be able to pinpoint specific problems and make the best adjustments to correct air flow. Afterwards, proper system balance can be confirmed using these same instruments.

If a system does not already have in-line dampers to adjust the air flow, a contractor can be hired to add them. In simple systems, this should not be a big job and can be a very worthwhile and cost-effective retrofit. In other systems, installation of such dampers may not be practical, either because of expense, lack of accessibility or some other cause. A qualified contractor can provide recommendations for each specific system.