# Balanced System

HVAC systems should be designed by an HVAC technician using ACCA Manual J. Load calculations should be done for each house and each room in the house, because each home has a unique heating and cooling requirement that depends on its size, how tight and well insulated it may or may not be, the climate, and even the geography of the site that protects or exposes the house to environmental conditions. Duct sizes and lengths are then calculated based on these loads. In homes, it is common for this step to be skipped due to the lack of awareness from the builder and homeowner. In commercial buildings, this step is required by most building codes and system design is typically more rigorous due to the more regimented commissioning process.

Poorly sized HVAC systems or ducts are two main reasons for discomfort and energy inefficiency in buildings.

In most cases, a balanced HVAC system is desirable for maximum comfort, safety and energy savings. A balanced HVAC system is one that operates under neutral pressure. That is, the amount of air blowing out the supply ducts should match the amount of air getting pulled into the return ducts. Ideally, ducts are located in conditioned space, which helps ensure that the system is balanced and retrieving air from a known (filtered) source.

When technicians service or replace existing air conditioning equipment, it is important to keep in mind that the indoor evaporator coil and the outdoor compressor need to be compatible. In remodeling work, it’s common for cooling contractors to retrofit the outside unit but not change the indoor unit. As a result, system efficiency and indoor comfort can drop off substantially.