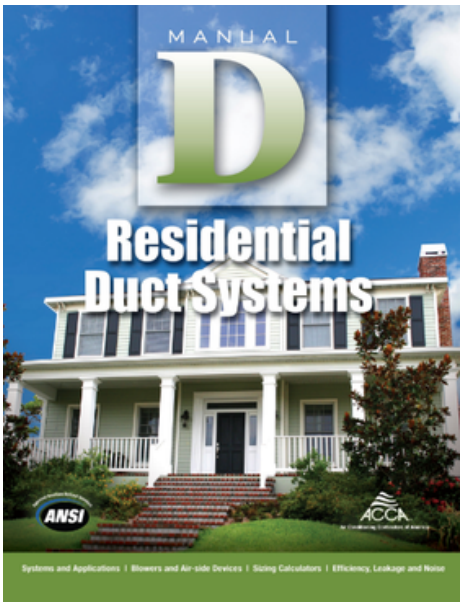
MANUAL D TERMINOLOGY

Xcel Energy®

Understanding the terminology used in Manual J, Manual S, and Manual D reports is essential for accurately interpreting HVAC system designs. Familiarity with key terms, calculations, and performance metrics enables technicians, designers, plans examiners, and inspectors to understand heating and cooling load requirements, equipment selection, and duct system design. This knowledge helps ensure that HVAC systems are properly sized, energy efficient, and capable of delivering the desired indoor comfort while meeting industry standards.



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APPLIANCE

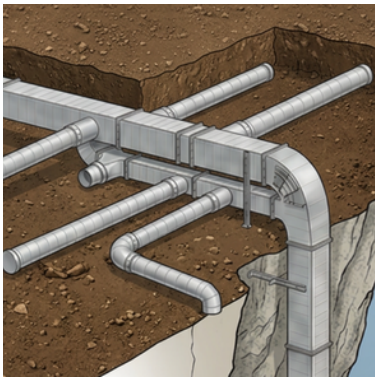
A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements. Like a furnace or an air conditioner. Unfortunately, equipment seems to be used interchangeably when what is meant is an appliance.

EQUIPMENT

Piping, ducts, vents, control devices and other components of systems other than appliances that are permanently installed and integrated to provide control of environmental conditions for buildings. This definition shall also include other systems specifically regulated in this code.

EXTERNAL STATIC PRESSURE

In an HVAC system refers to the resistance to airflow outside the air handler unit, specifically within the ductwork and associated components. It represents the pressure the HVAC fan needs to overcome to push air through the system's external components like ducts, filters, coils, and vents.



FRICTION RATE

The pressure drop in a duct system per 100 feet of ductwork. It's a crucial factor in determining the appropriate duct size and ensuring efficient airflow. A higher friction rate indicates greater resistance to airflow, potentially requiring larger ducts or adjustments to the system's static pressure.

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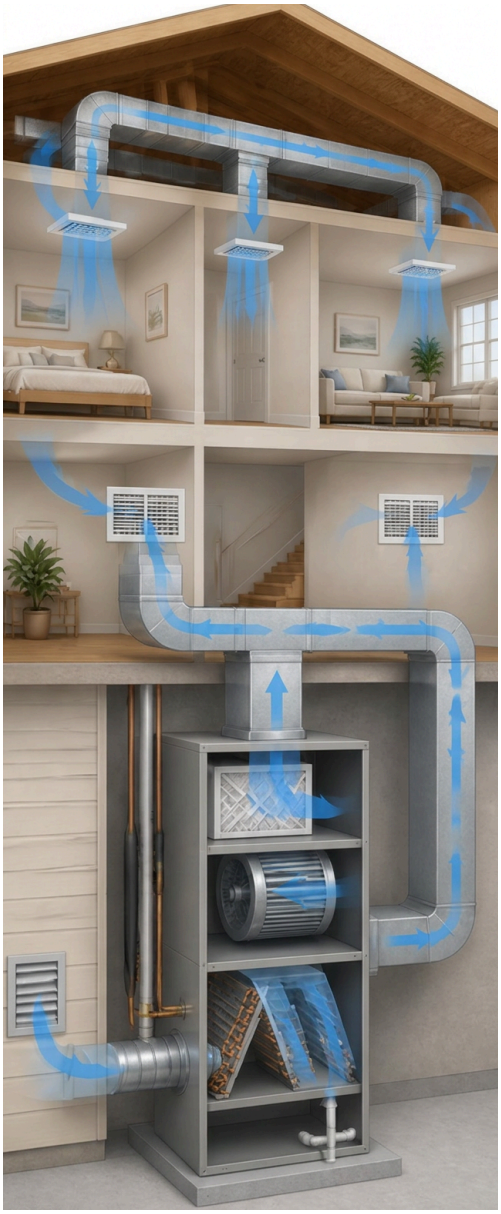

TOTAL EFFECTIVE LENGTH

Represents the total resistance to airflow within a duct system, expressed as the equivalent length of straight duct. It's calculated by adding the physical lengths of all duct sections to the equivalent lengths of all fittings (like elbows, transitions, etc.). Essentially, it's the length of straight duct that would produce the same pressure drop as the actual ductwork with all its fittings.

FITTING EQUIVALENT LENGTH

The length of straight duct that would cause the same pressure drop as the fitting. Essentially, it's a way to quantify the resistance to airflow that fittings introduce, by equating it to a certain length of straight duct. This value is crucial for accurately calculating the total equivalent length of a duct system, which is used to determine the friction rate and ultimately the appropriate duct sizes.

EQUIVALENT LENGTH OF FITTINGS

The length of straight duct that would cause the same pressure drop as the fitting. Essentially, it's a way to quantify the resistance to airflow that fittings introduce, by equating it to a certain length of straight duct.

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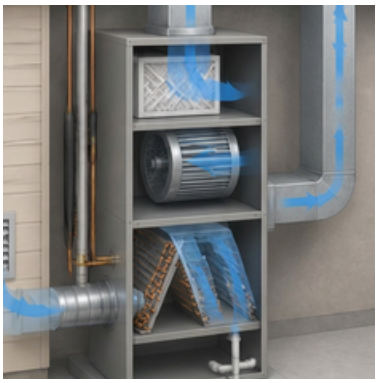
PRESSURE LOSSES

Reduction in the available static pressure by items placed into the air stream. i.e. indoor coil, heat exchanger, supply diffusers, return grills, filter, humidifiers, balancing dampers, and other devices.



AVAILABLE STATIC PRESSURE

Remaining external static pressure minus the pressure losses.

External Static Pressure – Pressure Loss = Available Static Pressure

LENGTH OF RUN-OUT

The measured length of the supply or return air duct from the trunk line to the diffuser

LENGTH OF TRUNK

The measured length of the trunk line from the furnace to the connection of a supply or return air duct to the trunk line