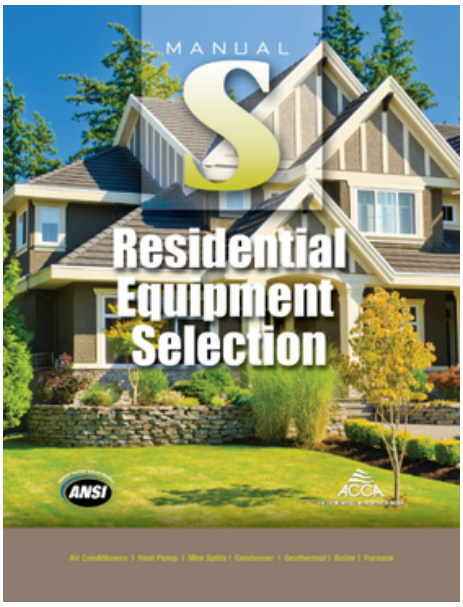


MANUAL S TERMINOLOGY

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.





Energy Code Support Program
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MANUAL S TERMINOLOGY



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.

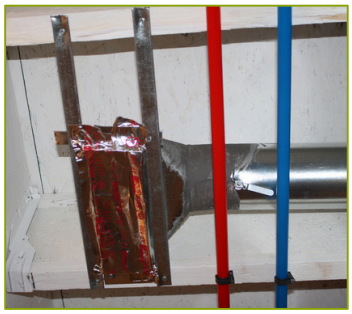
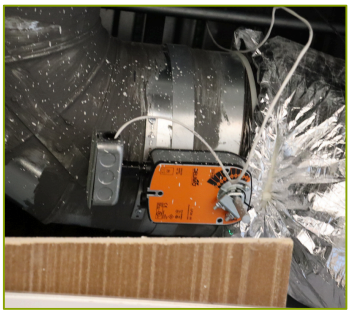




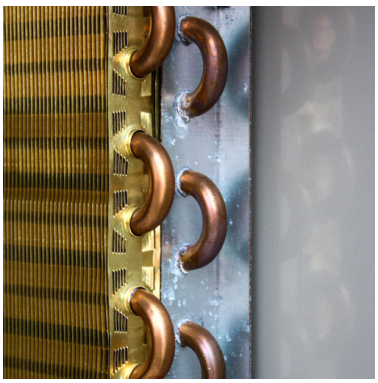



EQUIPMENT

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.

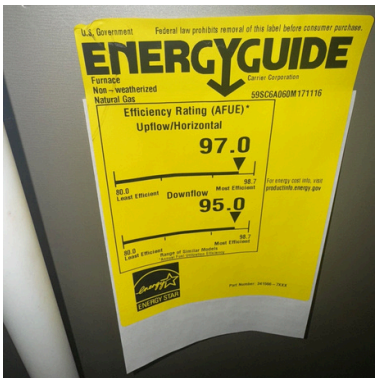




TEMPERATURE RISE

This is the difference in the return air entering the heat exchanger and the air leaving the heat exchanger.

MANUAL S TERMINOLOGY









EFFICIENCY

Measurement of how efficiently the appliance utilizes the energy source to heat or cool a space. The higher the efficiency rating means the appliance utilizes more of the energy source to heat or cool the space. 80% AFUE gas furnace means that 20% of the gas energy is wasted up the vent. 96% AFUE gas furnace only 4% of the gas energy is wasted up the vent.

Heating Ratings

AFUE(2) - Annual Fuel Utilization Efficiency: a percentage indicating how much fuel a furnace converts into usable heat

COP(2) - Coefficient of Performance: Measures instantaneous heating performance ratio of heat output divided by electrical energy input

Cooling Ratings

HSPF(2) - Heating Seasonal Performance Factor: measures the heating efficiency of heat pumps over the winter season

SEER(2) - Seasonal Energy Efficiency Rating: measures average seasonal cooling efficiency across varying temperatures

EER(2) - Energy Efficiency Ratio: measures instantaneous cooling efficiency at a 95°F outdoor temperature

I**EER-** Integrated Energy Efficiency Ratio: HVAC metric that measures commercial cooling performance across varying partial loads

MANUAL S TERMINOLOGY



AHRI REFERENCE

This number demonstrates the appliance has been tested per the performance metric standards. The appliance performance i.e. input, output, and efficiency listed has been tested and verified.



HEATING OR COOLING INPUT

The number of btu that will enter the appliance for the design.



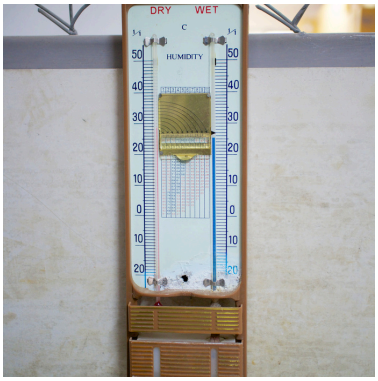
HEATING OR COOLING OUTPUT

The number of btu that leave the appliance. This will include the input btu and the efficiency of the appliance to determine the output.



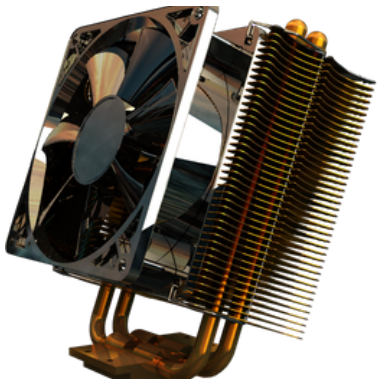
ALTITUDE DERATION

This is a calculation that takes into account the elevation of the location for gas fired appliances. Manufacturers will publish the deration for altitude for their gas fired heating appliances.



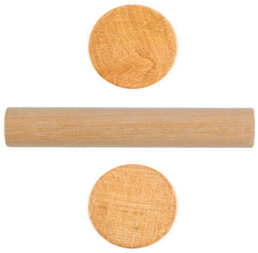
WET BULB

The lowest temperature to which air can be cooled by the evaporation of water. This is always lower than the dry-bulb temperature unless the air is at 100% humidity, in which case they are equal. The drier the air, the more water evaporates, and the lower the wet-bulb reading drops. Knowing the wet bulb temperature is needed for selecting the air conditioning appliance.



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.



SENSIBLE HEAT RATIO

This is where the sensible load is divided by the total load.