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Useful Information

Air

$BTU_{Sensible} = (CFM) \times (1.08) \times (T_2 - T_1)$

$BTU_{Total} = (CFM) \times (4.5) \times (h_2 - h_1)$

CFM = (Room Volume) x (Air Changes per Hour) ÷ 60

$P_{Total} = P_{Velocity} + P_{Static}$

$P_{Velocity} = (\text{Air Velocity} \div 4005)^2$

Water

$BTU = (GPM) \times (501) \times (T_2 - T_1)$

1 gallon (60°F) water = 8.34 lbs

Heating / Cooling

1 BTU = 0.29329 watt

1 watt = 3.413 BTU

1 HP = 746 watts = 2,546 BTU/hr

1 ton cooling = 12,000 BTU

Nominal 400 cfm per ton cooling

$BTU_{hr} = (U\ factor) \times (Area) \times (T_2 - T_1)$

U factor = (1 ÷ R value)

°F = (1.8 x °C) + 32

°C = 0.56 x (°F - 32)

Electricity

Volts = Amps x Ohms

Single Phase Motors (AC)

$$\text{Amps} = \frac{(HP \times 746)}{(\text{Volt} \times \text{Motor Efficiency})}$$

Three Phase Motors (AC)

$$\text{Amps} = \frac{(HP \times 746)}{(\text{Volt} \times \text{Mtr Eff} \times \text{Power Factor} \times 1.73)}$$

Fans

Air Flow varies directly with RPM
$CFM_a / CFM_b = RPM_a / RPM_b$

Static Pressure varies with the square of the RPM
$SP_a / SP_b = (RPM_a / RPM_b)^2$

Horsepower varies with the cube of the RPM
$HP_a / HP_b = (RPM_a / RPM_b)^3$

Other

Area of Circle = (3.142) x $(\text{radius})^2$

Circumference of Circle = (2) x (3.142) x (radius)

Speed of Sound = 1,130 ft / sec

Speed of Light = 186,000 miles / sec

1 mile = 5,280 ft