Norman S Wright CO
Manufacturer's Representatives

Phoenix	Albuquerque	El Paso	Tucson
602-275-4467	505-345-8811	915-772-9381	520-790-4490

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Formulas

Air Side HVAC Formulas

BTUHTotal = BTUHSensible + BTUHLatent

BTUHSensible = (1.08) x (CFM) x ΔT

BTUHTotal = (4.5) x (CFM) x ΔH

ACH =
Pvelocity = = C = 136.8, g = 32.2
= PVelocity + PStatic

Water Side HVAC Formulas

BTUH = GPM x 500 x T (water)

TONS = *GPM* x *ΔT 24* (CH water) (CT Ton = 15,000 BTUH)

FTHD = *psi* x *2.31 S.G.*

NPSHA = ha – hvpa + hst – hfs
ha = Absolute Pressure in feet of liquid on surface supply level.

hvpa = Head in feet corresponding to vapor pressure of liquid at the temperature being pumped.

hst = Static height that the liquid level is above (+) or below (–) the pump centerline

hfs = All suction line losses including the entrance loss and friction losses through pipe, valves and fittings.

Heating

Btu/hr = GPM x 500 x T
1 GPM at 20° T = 10,000 Btu/hr
Btu/hr / 10,000 = 1 GPM (@20° T)

Cooling

1 ton (CHW) = GPM x 500 x T/12,000
= 2.4 GPM (@10° T)

Latent heat

Btu/hr = .68 x CFM x grains

To cool air

Btu/hr = CFM x 4.5 x enthalpy
(enthalpy from psych chart)
GPM = Btu/hr / (500 x T)

To heat air

Btu/hr = CFM x 1.08 x T

To humidify air

#/hr H_2O = CFM x 4.5 x grains/7,000

Pump horsepower

HP = GPM x ft Head x .0002525/eff

Fan horsepower

HP = CFM x static pressure ("H_2O)
.000157/eff

Electrical Equations

KVA =
KW = KVA x P.F. =
KW motor input =
V = IR W = V x I = I^2 x R
$KW_{DC} = \frac{Amps \times Volts}{1,000}$