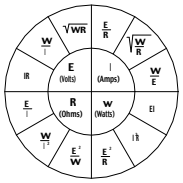
Formulas

Ohm's Law



Volts

Volts = $\sqrt{\text{Watts} \times \text{Ohms}}$

Volts = $\frac{\text{Watts}}{\text{Amperes}}$

Volts = Amperes x Ohms

Ohms

Ohms = $\frac{\text{Volts}}{\text{Amperes}}$

Ohms = $\frac{\text{Volts}}{\text{Amperes}^2}$

Ohms = $\frac{\text{Volts}^2}{\text{Watts}}$

Amperes

Amperes = $\frac{\text{Volts}}{\text{Ohms}}$

Amperes = $\sqrt{\frac{\text{Watts}}{\text{Ohms}}}$

Amperes = $\frac{\text{Watts}}{\text{Volts}}$

Watts

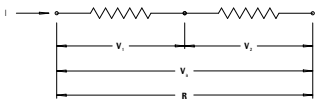
Watts = Volts x Amperes

Watts = Amps ^{2} x Ohms

Watts = $\frac{\text{Volts}^2}{\text{Ohms}}$

Watt Density = $\frac{\text{Watts}}{\text{Heated surface area}}$

Series Circuit

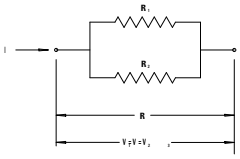


$R_t = R_1 + R_2$

$V_t = V_1 + V_2$

$I = \frac{V_t}{R_t + R_2}$

Parallel Circuit



$R = \frac{R_1 R_2}{R_1 + R_2}$

If $R_1 = R_2 : R = \frac{R_1}{2} = \frac{R_2}{2}$

$V_t = V_1 = V_2$

$I = \frac{V_t}{R}$

Typical 3 Phase Wiring Diagrams and Definitions

For Both Wye and Delta (Balanced Loads)

V_p = Phase Voltage

V_l = Line Voltage

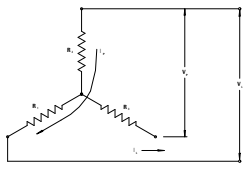
I_p = Phase Current

I_l = Line Current

R = R = R = Resistance of each branch

W = Wattage

3 Phase Wye (Balanced Load)



Equations For Wye Only

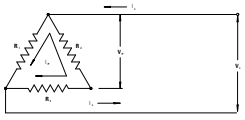
$I_l = I_p$

$V_p = V_l / \sqrt{3}$

$W_t = 3 \times R \times (V_l / \sqrt{3})^2 / R$

$W_t = \sqrt{3} \times V_l \times I_l$

3 Phase Delta (Balanced Load)



Equations For Delta Only

$I_p = I_l / \sqrt{3}$

$V_p = V_l$

$W_t = 3 \times (V_l / \sqrt{3})^2 / R$

$W_t = \sqrt{3} \times V_l \times I_l$

To Estimate Power Req'd To Heat Air Flow

Watts = CFM x T_r where ΔT = Temp. rise Δ deg. F