Electrical Circuits

To find:	Direct Current	Single Phase	Three Phase
Horsepower	$\frac{E \times I \times EFF}{746}$	$\frac{E \times I \times EFF \times PF}{746}$	$\frac{1.732 \times E \times I \times EFF \times PF}{746}$
Current	$\frac{746 \times HP}{E \times EFF}$	$\frac{746 \times HP}{E \times EFF \times PF}$	$\frac{746 \times HP}{1.732 \times E \times EFF \times PF}$
Efficiency	$\frac{746 \times HP}{E \times I}$	$\frac{746 \times HP}{E \times I \times PF}$	$\frac{746 \times HP}{1.732 \times E \times I \times PF}$
Power Factor	-------	$\frac{\text{Input watts}}{E \times I}$	$\frac{\text{Input watts}}{1.732 \times E \times I}$

E = Volts
EFF = Efficiency (decimal)
HP = Horsepower
I = Amperes
PF = Power Factor

Electric Motors

To find:	Direct Current	Single Phase	Three Phase
Amperes	$\frac{\text{Watts}}{\text{Volts}}$	$\frac{\text{Watts}}{\text{Volts} \times \text{Power Factor}}$	$\frac{\text{Watts}}{1.732 \times \text{Volts} \times \text{Power Factor}}$
Volt-Amperes	-----	Volts x Amperes	1.732 x Volts x Amperes
Watts	Volts x Amperes	Volts x Amperes x Power Factor	1.732 x Volts x Amperes x Power Factor

Ohm's Law

Ohms = Volts/Ampres (E / I) X R
Amperes = Volts/Ohms
Volts = Amperes x Ohms

Capacitance (in microfarads) at 60 Hertz

Capacitance = $\frac{2650 \times \text{Amperes}}{\text{Volts}}$

Capacitance = $\frac{2.65 \times \text{kVAR}}{(\text{Volts})^2}$

Motor Application Formulas

Horsepower = $\frac{\text{Torque (lb-ft)} \times \text{RPM}}{}$

Torque (lb-ft) = $\frac{\text{Horsepower} \times 5250}{\text{RPM}}$

Kilowatts = $\frac{\text{Torque (n-m)} \times \text{RPM}}{9550}$

Torque (n-m) = $\frac{\text{Kilowatts} \times 9550}{\text{RPM}}$

Synchronous RPM = $\frac{120 \times \text{Frequency (hz)}}{\text{Number of Poles}}$

Percent slip = $\frac{\text{Synchronous RPM - Full Load RPM}}{\text{Synchronous RPM}}$