Standard Electrical Formulas
Used for Power Consumption Calculations

TO DETERMINE	SINGLE-PHASE	THREE-PHASE	DIRECT CURRENT
Amperes (when HP is known)	$\frac{HP \times 746}{E \times \%EFF \times PF}$	$\frac{HP \times 746}{1.73 \times E \times \%EFF \times PF}$	$\frac{HP \times 746}{E \times \%EFF}$
Amperes (when kW is known)	$\frac{KW \times 1000}{E \times PF}$	$\frac{KW \times 1000}{1.73 \times E \times PF}$	$\frac{KW \times 1000}{E}$
Amperes (when KVA is known)	$\frac{KVA \times 1000}{E}$	$\frac{KVA \times 1000}{1.73 \times E}$	Not Applicable
Horsepower	$\frac{I \times E \times \%EFF \times PF}{746}$	$\frac{I \times E \times 1.732 \times \%EFF \times PF}{746}$	$\frac{I \times E \times \%EFF}{746}$
Kilovolt/ Amperes	$\frac{I \times E}{1000}$	$\frac{I \times E \times 1.73}{1000}$	Not Applicable
Kilowatts	$\frac{I \times E \times PF}{1000}$	$\frac{I \times E \times 1.73 \times PF}{1000}$	$\frac{I \times E}{1000}$

I = amperes
E = volts
KW = Kilowatts
KVA = kilovolt/amperes
HP = horsepower
% Eff. = percent efficiency
PF = power factor