ELECTRICAL FORMULEA & CONVERSION FORMULAE

ELECTRICAL FORMULAE

FACTOR	NEW SYMBOLS ALTERNATING CURRENT	OLD SYMBOLS ALTERNATING CURRENT
Watts	A x V x PF (1-phase) A x V x 1.73 x PF (3-phase)	I x E x PF (1-phase) I x E x 1.73 x PF (3-phase)
Kilowatts	$\frac{A \times V \times PF}{1000}$ (1-phase)	$\frac{I \times E \times PF}{1000}$ (1-phase)
	$\frac{A \times V \times 1.73 \times PF}{1000}$ (3-phase)	$\frac{I \times E \times 1.73 \times PF}{1000}$ (3-phase)
Amperes (when kW is known)	$\frac{kW \times 1000}{V \times PF}$ (1-phase)	$\frac{KW \times 1000}{E \times PF}$ (1-phase)
	$\frac{kW \times 1000}{V \times 1.73 \times PF}$ (3-phase)	$\frac{KW \times 1000}{E \times 1.73 \times PF}$ (3-phase)
Kilovolt-amperes (kVA)	$\frac{A \times V}{1000}$ (1-phase)	$\frac{I \times E}{1000}$ (1-phase)
	$\frac{A \times V \times 1.73}{1000}$ (3-phase)	$\frac{I \times E \times 1.73}{1000}$ (3-phase)
Frequency (hertz) Hz	$\frac{p \times RRM}{120}$	$\frac{p \times RPM}{120}$
Revolutions per minute	$\frac{Hz \times 120}{P}$	$\frac{f \times 120}{P}$
Power factor	$\frac{\text{Actual watts}}{A \times V} = \frac{kW}{kVA}$	$\frac{\text{Actual watts}}{1 \times E} = \frac{KW}{KVA}$
Amperes when kilowatts is known	$\frac{kW \times 1000}{V \times PF}$ (1-phase)	$\frac{KW \times 1000}{E \times PF}$ (1-phase)
Amperes when kilovolt-amperes is known	$\frac{kVA \times 1000}{V}$ (1-phase)	$\frac{KVA \times 1000}{E}$ (1-phase)
Amperes when horsepower is known	$\frac{kW}{V \times PF \times \%Eff}$	$\frac{HP \times 746 \times \%Eff}{E \times PF}$

ELECTRICAL CONVERSION FORMULAE

DESIRED DATA	SINGLE PHASE	THREE PHASE
KILO VOLT-Amperes (KVA)	$\frac{\text{Volts x AMPS}}{1000}$ or $\frac{KW}{P.F.}$	$\frac{1.73 \text{ x Volts x AMPS}}{1000}$ or
Kilowatts (KW)	$\frac{\text{Volts x AMPS x P.F.}}{1000}$ or KVA x P.F.	$\frac{1.73 \text{ x Volts x AMPS x P.F.}}{1000}$ or
Power Factor (P.F.)	$\frac{KW}{KVA}$	$\frac{KW}{KVA}$
Amperes — When KW is known	$\frac{KW \times 1000}{\text{Volts x P.F.}}$	$\frac{KW \times 1000}{1.73 \text{ x Volts x P.F.}}$
Amperes — When KVA is known	$\frac{KVA \times 1000}{\text{Volts}}$	$\frac{KVA \times 1000}{1.73 \text{ x Volts}}$
Frequency (Hertz)	$\frac{\text{Number of Poles x R.P.M.}}{120}$	
Revolutions Per Minute (R.P.M.)	$\frac{\text{Hertz x 120}}{\text{Number of Poles}}$	