

General Formulas



Generator Formulas^①

Desired Data	Single Phase	Three Phase
Kilo Volt Amperest (kVA)	$\frac{\text{Volts} \times \text{Amps}}{1000}$ or $\frac{\text{kW}}{\text{P.F.}}$	$\frac{\sqrt{3} \times \text{Volts} \times \text{Amps}}{1000}$ or $\frac{\text{kW}}{\text{P.F.}}$
Kilowats (kW)	$\frac{\text{Volts} \times \text{Amps} \times \text{P.F.}}{1000}$ or $\text{kVA} \times \text{P.F.}$	$\frac{\sqrt{3} \times \text{Volts} \times \text{Amps} \times \text{P.F.}}{1000}$ or $\text{kVA} \times \text{P.F.}$
Power Factor (P.F.)	$\frac{\text{kW}}{\text{kVA}}$	$\frac{\text{kW}}{\text{kVA}}$
Amperes When kW is Known	$\frac{\text{kW} \times 1000}{\text{Volts} \times \text{P.F.}}$	$\frac{\text{kW} \times 1000}{\sqrt{3} \times \text{Volts} \times \text{P.F.}}$
Amperes When kVA is Known	$\frac{\text{kVA} \times 1000}{\text{Volts}}$	$\frac{\text{kVA} \times 1000}{\sqrt{3} \times \text{Volts}}$
Minimum HP Required for Prime Mover	$\frac{\text{kW}}{\text{Alternator Efficiency} \times 0.746}$	
Frequency (Hz)	$\frac{\text{Number of Poles} \times \text{RPM}}{120}$	
Revolutions Per Minute (RPM)	$\frac{\text{Hz} \times 120}{\text{Number of Poles}}$	
Number of Poles	$\frac{\text{Hz} \times 120}{\text{RPM}}$	

① V = Volts
A = Current (Amps)
P.F. = Power Factor