



3025 W. Nine Mile Road  
Pensacola, FL. 32534  
(850) 478-4101  
www.kraftronics.com

## MOTOR CONTROL FORMULAS

To calculate motor full load torque:

$$T = \frac{(5250) (HP)}{N}$$

Where: T = torque (ft lbs)  
HP = horsepower  
N = motor base speed (RPM)

To calculate horsepower:

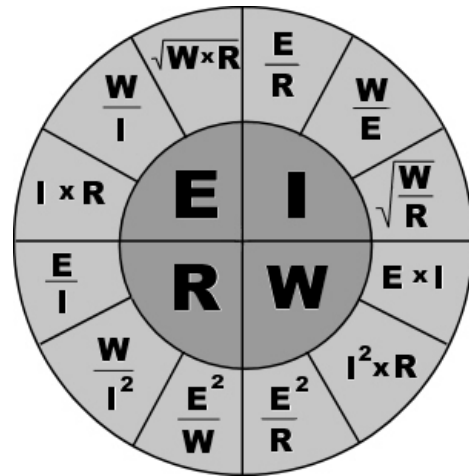
$$HP = \frac{TN}{5250}$$

Where: T = torque (in-lbs)  
N = speed (RPM)

To calculate synchronous speed:

$$rpm_{syn} = \frac{(120) (f)}{N_p}$$

Where: rpm<sub>syn</sub> = synchronous speed  
f = supply frequency  
N<sub>p</sub> = number of poles



## AC/DC Formulas

To Find:	Direct Current	AC / 1phase 115v or 120v	AC / 1phase 208,230, or 240v	AC 3 phase All Voltages
Amps when Horsepower is Known	$\frac{HP \times 746}{E \times Eff}$	$\frac{HP \times 746}{E \times Eff \times PF}$	$\frac{HP \times 746}{E \times Eff \times PF}$	$\frac{HP \times 746}{1.73 \times E \times Eff \times PF}$
Amps when Kilowatts are known	$\frac{kW \times 1000}{E}$	$\frac{kW \times 1000}{E \times PF}$	$\frac{kW \times 1000}{E \times PF}$	$\frac{kW \times 1000}{1.73 \times E \times PF}$
Amps when kVA is known		$\frac{kVA \times 1000}{E}$	$\frac{kVA \times 1000}{E}$	$\frac{kVA \times 1000}{1.73 \times E}$
Kilowatts	$\frac{I \times E}{1000}$	$\frac{I \times E \times PF}{1000}$	$\frac{I \times E \times PF}{1000}$	$\frac{I \times E \times 1.73 \times PF}{1000}$
Kilovolt-Amps		$\frac{I \times E}{1000}$	$\frac{I \times E}{1000}$	$\frac{I \times E \times 1.73}{1000}$
Horsepower (output)	$\frac{I \times E \times Eff}{746}$	$\frac{I \times E \times Eff \times PF}{746}$	$\frac{I \times E \times Eff \times PF}{746}$	$\frac{I \times E \times Eff \times 1.73 \times PF}{746}$

E = Voltage / I = Amps / W = Watts / PF = Power Factor / Eff = Efficiency / HP = Horsepower