TECO
Rotates the world

USEFUL GENERAL FORMULAS AND DEFINITIONS

Name	Formula	Units	Defination
Kilowatt loss	$= \frac{HP\ (.746)\ X\ (1.0 - efficiency)}{efficiency}$		
Power Output	1HP = 745W = 0.746Kw		HP : hosepower
Current	$I = \frac{E}{R}$	I in Amp	E : Volt R : Ohm
Input power	$P_{in} = E.I.Cos\phi$ - (1 Ø) $P_{in} = \sqrt{3}.\ E.I.Cos\phi$ - (3 Ø)	P_{in} in W	E : Volt I : ampere
Output power	$P_{0ut} = E.I.\ \eta.Cos\phi$ - (1 Ø) $P_{0ut} = \sqrt{3}.\ E.I.\ \eta.Cos\phi$ - (3 Ø)	P_{out} in W	
Efficiency	$\eta = \frac{P_{0ut}}{P_{in}} X\ 100\%$		
Power factor	$Cos\phi = \frac{P_{in}}{\sqrt{3}.\ E.I.}$ % - (3 Ø)		
Synchronous speed	$N_s = \frac{120\ f}{P}$	N_s in min^{-1}	f : frenquency of the power supply P : poles
Slip	$S = \frac{N_s - N}{N_s} X\ 100\%$		N : motor speed
Torque	$T = \frac{974\ Kw}{N}$	T in kgf-m	1 kgf-m = 9.8 N-m
Power	$P = 1.027\ NT$	P in W	
Reative power absorbed by the motor	$Q = \sqrt{3}.\ E.I.SIN\ \phi$ - (3 Ø)	Q in VAR	

- The **Locked-Rotor Torque** of a motor is the minimum torque which it will develop at rest for all angular position of the rotor, with rated voltage applied at rated frenquency
- The **Pull-in torque** is the maximum constant torque under which the motor will pull its connected inertial load into synchronous speed at rated voltage and frenquency, when its field excitation is applied.
- The **Pull-out Torque** is the maximum sustained torque under which the motor will develop at synchronous-speed with rated voltage applied at rated frequency and with normal excitation
- The **Full-Load Torque** is the torque necessary to produce its rated horsepower at full-load speed. In Kg at a 1 meter radius, it is equal to the KW times 974 divided by the full-load speed
- The **Accelerating Torque** is the difference between the motor torque and the load torque from 0 to pull-in speed. A 10% or higher margin is desired to avoid a possible stalled or locked rotor position.
- The **Power Factor** or and alternating- current motor or generator is the ratio of the KVA input (or output) to the Kilowatt input