AEI Cables - Birtley

TECHNICAL INFORMATION

Formula for Single and Three Phase Alternating Current

Where :

HP	=	Horsepower to be provided.
kW	=	Kilowatts to be provided.
kVA	=	Kilovolt amperes to be provided.
V	=	Difference of potential between conductors at receiving end (declared pressure)
η	=	Efficiency of motor, or average efficiency of motors if more than one. Where the load is all lighting 'η' may be ignored. Where the load is mixed lighting and power the value of 'η' should be taken somewhere between the efficiency of the motor (or motors) and unity.
cos $\varnothing$	=	Power factor or average power factor of motors if more than one. Where the load is all lighting cos $\varnothing$ may be ignored. Where the load is mixed lighting and power the value of cos $\varnothing$ should be taken somewhere between the power factor of the motor (or motors) and unity.
I	=	Current in amperes.

Then

Single Phase

$$I = \frac{hp \times 746}{V \times \eta \times \cos \varnothing}$$

$$I = \frac{kW \times 1000}{V \times \cos \varnothing}$$

$$I = \frac{kVA \times 1000}{V}$$

Three Phase

$$I = \frac{hp \times 430}{V \times \eta \times \cos \varnothing}$$

$$I = \frac{kW \times 577}{V \times \cos \varnothing}$$

$$I = \frac{kVA \times 577}{V}$$

kW of Motor	HP of Motor	Direct Current	Alternating Current					
			Single Phase		Two Phase		Three Phase	
		η	η	cos $\varnothing$	η	cos $\varnothing$	η	cos $\varnothing$
0.746	1	0.76	0.65	0.80	0.73	0.79	0.74	0.81
3.73	5	0.83	0.78	0.83	0.84	0.84	0.85	0.86
7.46	10	0.86	0.81	0.84	0.87	0.86	0.88	0.88
14.91	20	0.88	0.83	0.85	0.88	0.88	0.90	0.90
37.28	50	0.90	0.85	0.87	0.91	0.90	0.91	0.91
55.93 +	75 +	0.92	0.86	0.88	0.92	0.91	0.92	0.92