CONTACTOR UTILISATION CATEGORIES (IEC 947.4)

Category AC1	Applies to all types of a.c. load with a power factor of less than 0.95 (Cos p ≥ 0.95 i.e. non-inductive or slightly inductive loads. Application examples : heating, distribution.	**Category AC2**	This category applies to the starting, plugging, inching and switching off of slip-ring motors. On closing, the contactor makes the starting current, which is approx. 2.5 times the rated current of the motor. On opening, the contactor breaks the starting current at a voltage that is less than or equal to that of the mains supply voltage.
Category AC3	Applies to squirrel cage motors with switching off during normal running. On closing, the contactor makes the starting current which is between 5 and 7 times the rated current of the motor. On opening, the contactor breaks the rated motor current : at this point the voltage at the contactor pole terminals is approx. 20% of the mains supply voltage. Breaking is light. Application examples : all standard squirrel cage motors, lifts, escalators, conveyors, bucket elevators, compressors, pumps, mixers, air conditioning units, etc.	**Category AC4**	This category applies to with plugging and inching (jogging) of squirrel cage motors. On closing, the contactor makes a current which may be as high as 5 or 7 times the rated motor current. On opening, the contactor breaks the same current at a voltage which is higher the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe. Examples : printing machines, wire drawing machines, cranes and hoists, metallurgy.

ELECTRICAL FORMULA

DESIRED DATA	A.C. SINGLE PHASE	A.C. THREE PHASE	DIRECT CURRENT
Kilowatt Output :	$\frac{V \times I \times \%Eff \times P.F}{1000}$	$\frac{V \times I \times 1.73 \times \%Eff \times P.F}{1000}$	$\frac{1 \times V \times \%Eff}{1000}$
kVA :	$\frac{V \times I}{1000}$	$\frac{V \times I \times 1.73}{1000}$	
Horsepower Output :	$\frac{V \times I \times \%Eff \times P.F}{746}$	$\frac{V \times I \times 1.73 \times \%Eff \times P.F}{746}$	$\frac{V \times I \times \%Eff}{746}$
Amperes when horsepower is known :	$\frac{HP \times 746}{V \times \%Eff \times P.F}$	$\frac{HP \times 746}{1.73 \times V \times \%Eff \times P.F}$	$\frac{HP \times 746}{V \times \%Eff}$
Amperes when kilowatts is known :	$\frac{kW \times 1000}{V \times \%Eff \times P.F}$	$\frac{kW \times 1000}{1.73 \times V \times \%Eff \times P.F}$	$\frac{kW \times 1000}{V \times \%Eff}$
Amperes when kVA is known :	$\frac{kVA \times 1000}{V}$	$\frac{kVA \times 1000}{1.73 \times V}$	
V = Volts	**I = Amperes**	**%Eff = Percent Efficiency**	**P.F = Power Factor**

PRESSURE TABLE

P.S.I.	bar	kPa
1	0.06	6.89
5	0.34	34.48
10	0.68	68.96
20	1.37	137.93
30	2.06	206.89
50	3.44	344.82
75	5.17	517.24
100	6.89	689.65
125	8.62	862
150	10.34	1034
175	12.06	1206
200	13.79	1379
250	17.24	1724
300	20.68	2068
1kPa = 0.01 bar	1MPa = 10.00 bar	1kg/cm² = 1.00 atm
1 PSI = 6.895 kPa	1 kPa = 0.145 PSI	1kg/cm² = 14.223 PSI

METRIC CONVERSION TABLE

Length and Distance :	Surface Area :
inches x 25,4 = millimeters	square inches x 6.5 = square centimeters
feet x 30,48 = centimeters	square feet x 0.09 = square meters
yards x 0.9 = meters	square yards x 0.83 = square meters
miles x 1.6 = kilometers	square miles x 2.6 = square kilometers

Volume & Capacity	Weight & Mass
ounces (fluid) x 30 = milliliters	ounces x 28 = grams
pints x 0.47 = liters	pounds x 0.45 = kilograms
quarts x 0.95 = liters	tons x 0.9 = metric tons
gallons x 3.8 = liters	