

# Conversion Constants

The units and symbols used in this catalogue comply with the requirements of the Measuring Units and National Measuring Standards Act.

## LENGTHS

Inches x 25.400 1 = millimetres.  
 Inches 0.025 4 = metres.  
 Feet x 0.304 80 = metres.  
 Yards x 0.914 40 = metres.  
 Feet x 0.000 304 80 = kilometres.  
 Statute Miles x 1.609 35 = kilometres.

## TORQUE

Kilogramforce Metre (kgf.m) x 9.81 = newton metre (N.m).  
 Pound Feet x 1.36 = newton metre (N.m).  
 Pound Inches x 0.113 = newton metre (N.m).

## FORCE

Kilogramforce x 9.81 = newtons(N).  
 Poundforce x 4.45 = newtons (N).  
 The Kilopond (Kp) is an alternative name for the Kilogramforce (kgf).

## POWER

Horse Power (hp) x 0.746 = kilowatt (kW).

## ADDITIONAL SYMBOLS USED

r/min = revolutions per minute.  
 m/s = metres per second.  
 To convert foot per minute to m/s multiply by  $5.08 \times 10^{-2}$ .

## TORQUE AND POWER EQUIVALENTS

The kilowatt (kW) is the common unit of mechanical power, i.e. the rate of doing work.  
 Torque is a turning moment or twisting effort and is expressed in newton metre (N.m).

$$N.m = \frac{kW \times 9\,550}{r/min} \quad kW = \frac{N.m \times r/min}{9\,550}$$

## INERTIA

Pound feet squared (lbf.ft<sup>2</sup>) x 0.413 39 = newton metre squared (N.m<sup>2</sup>).

## POLAR MOMENT OF INERTIA

The polar moment of inertia, I or flywheel effect of a solid cylinder, disc or hollow cylinder can be derived from the following formula:  
 For a disc or cylinder,  $I = 0.5 m.r^2$   
 Where m is the mass of the disc or cylinder and R and r are the outside and inside radii respectively.

## PERIPHERAL SPEED

$$s = \frac{d \times n}{19\,100}$$

where s = belt speed .....m/s  
 d = pulley pitch diameter .....mm  
 n = rotational speed .....r/min

## TEMPERATURE

$$^{\circ}C = \frac{(F - 32) \times 5}{9} \quad ^{\circ}F = \frac{(^{\circ}C \times 9)}{5} + 32$$

where  $^{\circ}F$  = degrees Fahrenheit.  
 $^{\circ}C$  = degrees Centigrade.

AC = Power =  $\sqrt{3} V I \cos \theta$  Assume  $P = I^2 R$   $\eta$  is efficiency of motor

3 phase

DC = Power =  $V I \cos \theta = I^2 R$  Assume Power Factor ( $\cos \theta$ ) = 0.8.

$T = \frac{kW \times 9555}{RPM}$