

# Useful Formulae and Conversion factors

## Low Frequency Response, Piezo Sensors

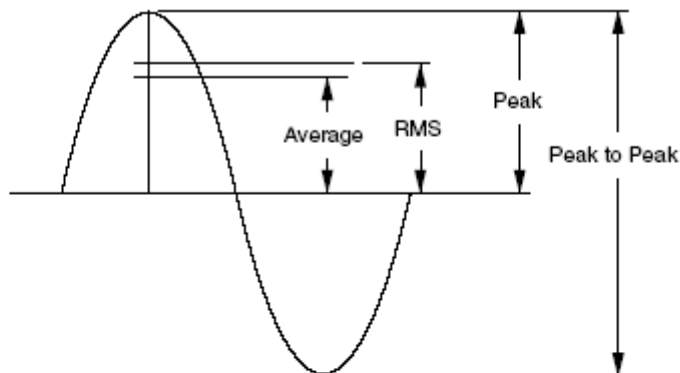
Lower Corner Frequency (-3dB Frequency) 1st Order High Pass

$$f_c = \frac{1}{2\pi} \times \frac{1}{\tau} = \frac{1}{2\pi} \times \frac{1}{TC} \times \frac{1}{TC} \quad (\text{Hz})$$

Note:  $\tau = TC =$  Discharge Time Constant, Seconds

Lower -5% frequency =  $3 \times f_c$ , e.g.,  $f_{-5\%} = 3f_c$  (Hz)

## Sinusoidal Waveform



Average Value =  $0.637 \times$  Peak Value

RMS Value =  $0.707 \times$  Peak Value

Peak Value =  $1.414 \times$  RMS Value

Peak to Peak Value =  $2 \times$  Peak Value

Peak to Peak Value =  $2.828 \times$  RMS Value

## Acceleration

Multiply	by	To Obtain
Accel. of Gravity	9.80665	meters/sec <sup>2</sup>
	32.174	feet/sec <sup>2</sup>
	386.088	inches/sec <sup>2</sup>
cm/sec <sup>2</sup>	0.010	meters/sec <sup>2</sup>
feet/sec <sup>2</sup>	0.3048	meters /sec <sup>2</sup>
inches/sec <sup>2</sup>	0.02540	meters/sec <sup>2</sup>

## Velocity

Multiply	by	To Obtain
feet/minute	5.080	mm/sec
feet/sec	0.3048	meters/sec
inches/sec	0.0254	meters/sec
km/hour	0.6214	miles/sec
knots	0.5144	meters/sec
	1.151	miles/hr US
meters/sec	3.2808	feet/sec
	2.237	miles/hr US
miles/hour	88.0	feet/min
	0.447	meters/sec
	1.6093	km/hr
	0.8684	knots

## Pressure

Multiply	by	To Obtain
atmospheres	1.01325	bars
	33.90	feet of H <sub>2</sub> O
	29.92	inches of Hg
	760	mm of Hg
	101.325	kN/m <sup>2</sup> (kPa)
	14.696	lbs/in <sup>2</sup>
bars	75.01	cm of Hg (Torr)

## Force/Mass

Multiply	by	To Obtain
dynes	$10^{-5}$	newtons
grams (force)	980.7	dynes
kilograms (force)	9.80665	newtons
	1.00	kilopound newton
	$10^{-5}$	dynes
	0.1020	kilograms (force)
	3.597	ounces (force)
	0.2248	lbs (force)
	7.2330	poundals
ounces (force)	0.2780	newtons
	0.0625	pounds (force)
pounds (force)	16.00	ounces (force)
	0.45359	kilograms (force)
	4.448	newtons
tons (force, short)	2000	pounds (force)
	8896	newtons
carats	0.200	grams
grams	0.03527	ounces (avdp)
kilograms	2.2046	ounces (avdp)
ounces (avdp)	28.35	grams
pounds (avdp)	16.0	ounces (avdp)
	453.6	grams

# Relationships, Displacement, Velocity and Acceleration

