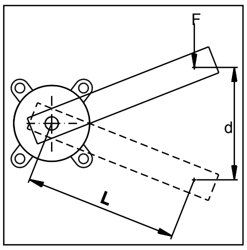
Metric Units

Given quantity and unit

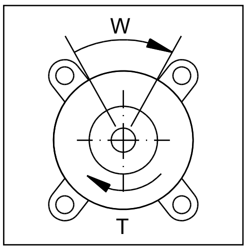
F	N	= force of weight on end of lever	**t**	s	= time taken to move this distance	**M**	kg	= mass
L	m	= effective length of lever	**w**	rad/s	= speed of rotation	**V**	m/s	= velocity of mass
d	m	= distance moved by end of lever	**T**	Nm	= torque applied to shaft	**f**	Hz	= frequency of vibration



1 Steady movement in a straight line.

Required rate:

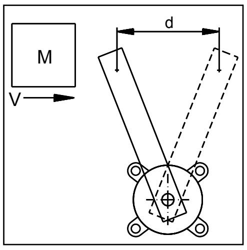
$$= \frac{FL^2t}{d} \text{ Nm/rad/s}$$



2 Steady rotation.

Required rate:

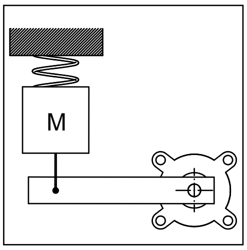
$$= \frac{T}{w} \text{ Nm/rad/s}$$



3 Deceleration of mass moving in a straight line.

Required rate:

$$= \frac{MVL^2}{d} \text{ Nm/rad/s}$$



4 Critical damping of vibrating mass.

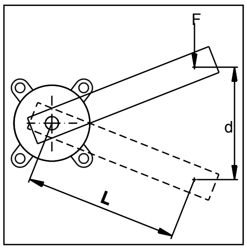
Required rate:

$$= \frac{MfL^2}{0.08} \text{ Nm/rad/s}$$

English Units

Given quantity and unit

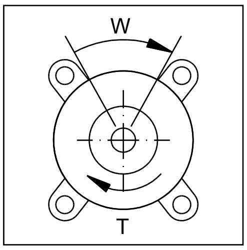
F	lbf	= force of weight on end of lever	**t**	s	= time taken to move this distance	**M**	lbf	= mass
L	in	= effective length of lever	**w**	rad/s	= speed of rotation	**V**	in/s	= velocity of mass
d	in	= distance moved by end of lever	**T**	lbf.ins	= torque applied to shaft	**f**	Hz	= frequency of vibration



1 Steady movement in a straight line.

Required rate:

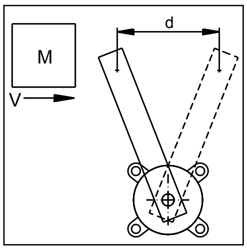
$$= \frac{FL^2t}{d} \text{ lbf.ins/rad/s}$$



2 Steady rotation.

Required rate:

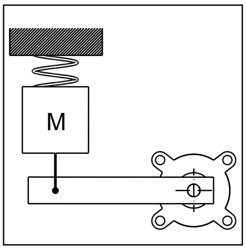
$$= \frac{T}{w} \text{ lbf.ins/rad/s}$$



3 Deceleration of mass moving in a straight line.

Required rate:

$$= \frac{MVL^2}{386d} \text{ lbf.ins/rad/s}$$



4 Critical damping of vibrating mass.

Required rate:

$$= \frac{MfL^2}{30.7} \text{ lbf.ins/rad/s}$$

Conversion factors

1 rad	= 57.3°	1 RPM	= 0.1047 rad/s	1 lbf.ins	= 0.113 Nm		
1 Nm	= 8.85 lbf.ins	1 lbf	= 4.45 N	9.81 N	= 1 kgf	=	1 kp