Experimental Arrangement





• The gravitational force between the mass 'M' & 'm' causes the system of sod & masses (both 'm') to rotate which causes the twist in the wire. i.e.; the counter torque due to wire = KO Compensates for the torque due to the system of rod & masses

$$\frac{L}{2} = \frac{G m M}{v^2} + \frac{L}{2} = \frac{G m M}{v^2} = \frac{K}{v} \Theta$$
Torsional
Torque due to
force on man
'm' (Left side) mass 'm' (sight side)

$$\frac{G_{T}}{L} = \frac{K}{L} \Theta v^2$$

$$\frac{36,196.065 \times 10^{-17}}{57.45 \times 10^{-4}}$$

$$= 630.0 \times 10^{-13}$$

$$= 6.3 \times 10^{-11}$$

K-Toxsional constant is obtained
by measuring time period of twisted
wire T = 2T T I I = ml²
Margod
For numerical value of 'k', 'b', 'l' 'm' & M'
See next Page

	Scientific Lab Equipment is
torsion constant κ	3.10 ± 0.10 × 10 ⁸ N m (calculated from PASCO specs and direct = K measurement) = K CRefer to the link below)
oscillation period T	498.2 ± 6.0 s (from direct measurement) -> This is the time it takes for the wire to twist
max. excursion angle	less than 5 × 10 ⁻² radians, or less than 3 degrees (from direct measurement) One Complete when large masses moved from one position to another One Complete
equilibrium angle θ	5.40×10^{-3} radians [0.310 deg] ± 15% (from direct measurement) ≥ 0 the 'M' mass is
small sphere separation r	from PASCO spec: 46.5 mm when large mass is against the case and small ball is in the center position within the case. Note that the accuracy of this value depends upon how well the balance is centered within the case. = ? Position 'I' to
large sphere mass M	1500 g (from spec) = M
small sphere mass m	38.3 ± 0.2 g (from spec) = m. Sub. these values
distance from center of small mass to torsion axis	$\frac{50 \text{ mm}(\text{from spec})}{2} = \frac{L}{2}$
The	above data can also be referred

in following Link

https://sciencedemonstrations.fas.harvard.edu/presentations/ cavendish-experiment

· For the Equipment shown as a picture in Page 1' visit the following link

https://www.pasco.com/products/lab-apparatus/fundamental-constants/gravitational-torsion-balance/stants/gravitation-balance/stants/gravitational-torsion-bala