Inertia in Rotational Motion Apparatus (SMT-TM-13)

The resistance with which a rigid body opposes a change to its rotation is indicated by the mass moment of inertia. Here, the behavior of the body depends on its mass and the distribution of this mass relative to the axis of rotation. Mathematically, the quotient of the rotary moment and the angular acceleration is the mass moment of inertia. A support rod supports the rotary axis with the studied body. The rotary axis is accelerated by a weight, pulley and cable with a drum. This results in a uniformly accelerated rotational motion. Using the measured time, mass and acceleration distance, we can calculate the mass moment of inertia. Systems with different masses and mass distributions can be studied in various geometries. Using a rotating bar with masses, it is possible to study the mass moment of inertia as a function of the radius.

TECHNICAL SPECIFICATIONS

Specifications:

- Investigation of the inertia of various bodies in rotational motion.
- Hollow cylinder, solid cylinder or rotating bar with masses as a rotating body.
- Generate a uniformly accelerated rotational motion via weight, pulley and cable drum.
- Rotating bar: adjustable position of the mass to realise different radii.
- Measure the time and the acceleration distance.
- Table mount compact unit.

Technical Data:

- Rotating bar:
    - Length: 550mm.
    - Masses: 2x 0.1kg, 2x 0.2kg, 2x 0.4kg.
- Solid cylinder:
    - Diameter: 120mm.
    - Mass: 0.9kg.
- Hollow cylinder:
    - Outer diameter: 120mm.
    - Inner diameter: 110mm.
    - Mass: 0.9kg.

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Technical Data:

- Weight for the drive:
    - 1N.
- LxWxH: 730x180x480mm (set-up).
- Weight: approx. 13kg.

Experimental Data:

- Investigation of the inertia of rigid bodies in rotational motion
- Determine mass moments of inertia of different, regularly shaped bodies
- Investigation of the mass moment of inertia as a function of the radius