

TM 161

Rod pendulum and thread pendulum



Description

investigation of pendulum swings comparing physical and mathematical pendulums

Pendulums perform oscillations. Gravity produces the restoring moment. We distinguish between mathematical and physical pendulums. A mathematical pendulum describes an idealised thread pendulum. In physical pendulums, the shape and size of the pendulum body is taken into account. Both are theoretical models for the description of a real pendulum. The TM 161 unit is used to study pendulum swings. A thread pendulum (mathematical pendulum) and a rod pendulum (as a physical pendulum) are compared to each other. The unit contains a metal rod with a movable auxiliary mass as the rod pendulum. The suspension point can be adjusted on the knife-edge bearing of the pendulum. The length of the thread pendulum can be easily changed using a clamping device.

The experimental unit is designed to be fixed to a wall.

Learning objectives/experiments

- oscillation period of thread pendulum and rod pendulum
- determine centre of gravity on the rod pendulum
- reduced pendulum length and centre of inertia of the rod pendulum

Specification

- experiments on pendulum swings, comparison of physical and mathematical pendulums
- [2] rod pendulum as physical pendulum, made of metal and mounted on knifeedge bearing
- knife-edge bearing mounted to slide on the rod to effectively vary the pendulum length
- [4] weight for the rod pendulum, sliding
- [5] thread pendulum as a mathematical pendulum
- [6] adjustable length of the thread pendulum
- [7] stopwatch to measure the oscillation period
- [8] bracket for wall mounting

Technical data

Thread pendulum

- length: up to 2000mm
- nylon rope
- weight
- ▶ diameter: 50mm
- ▶ mass: 0,52kg

Rod pendulum

- length:1000mm
- diameter: 8mm
- mass: 0,39kg
- pendulum weight
- ▶ diameter: 50mm
- ▶ mass: 0,49kg
- Stopwatch: 1/100s

Measuring tape: 3m

LxWxH: 250x80x2000mm Weight: approx. 5kg

Scope of delivery

- 1 experimental unit
- 1 set of instructional material

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