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

[1] experiments on pendulum swings, comparison of physical and mathematical pendulums
[2] rod pendulum as physical pendulum, made of metal and mounted on knife-edge bearing
[3] 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