TM 164
Coil spring vibrations

Description

- **torsional oscillations of a spring-mass system**

In helical springs, the spring force is generated by the elastic deformation of a metal band wound in an Archimedean spiral. If a mass is attached to the spring, we refer to it as a spring–mass system. The resistance that the spring presents opposite of the elastic deformation is known as spring stiffness. It is a characteristic variable of the spring.

The TM 164 unit comprises a helical spring connected to a rotating lever. Masses can be attached to the lever at various distances. This creates a spring-mass system, which can be used to study the effects of the spring stiffness, mass and mass distribution on the oscillation frequency. The deflection angle can be read on an angle scale.

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

Learning objectives/experiments

- determine the rigidity of a helical spring
- determine the natural frequency of a spring-mass system
- investigate the effect of mass and mass distribution

Specification

[1] investigate vibrations on a spring-mass system
[2] lever with sliding mass to deflect the helical spring
[3] adjustable distance of the mass to the rotation axis
[4] angle scale for reading the angle of deflection
[5] stopwatch to measure the oscillation period
[6] determine the natural frequency and the spring stiffness
[7] bracket for wall mounting

Technical data

Helical spring
- cross-section: 10x1mm
- spring length: approx. 800mm
- inner radius: 10mm
- outer radius: 50mm
- winding distance: 8,5mm

Sliding mass: 2x 0,5kg

Distance from mass to rotation axis
- 36...150mm

Deflection angle
- max. 360°
- graduation: 1°

Stopwatch: 1/100s

LxWxH: 250x200x360mm
Weight: approx. 6kg

Scope of delivery

1 experimental unit
1 set of instructional material