

SE 110.58

Free vibrations in a bending beam



The illustration shows SE 110.58 in a frame similar to SE 112.

Description

- **natural frequency on the freely vibrating bending beam**
- **approximation method according to Rayleigh**

An oscillator, which is left alone after a single excitation, performs free vibrations. The frequency of the free vibration is the natural frequency of the oscillator.

In SE 110.58, a bending beam is used as the system's oscillator. The bending beam can be used vertically standing or hanging and in the horizontal position in the SE 112 mounting frame.

The natural frequency is affected by the clamp length and the sliding weights. The bending beam is deflected by hand and performs free, damped vibrations. The resulting amplitudes are measured via strain gauges and a measuring amplifier. The measured values are transmitted directly to a PC via USB, where they can be displayed and the results of the experiments analysed graphically using the software included.

Learning objectives/experiments

- free vibration in a vertical and horizontal bending beam
- determine the natural frequency according to Rayleigh
- how clamping length and mass affect the natural frequency

Specification

- [1] investigation of the free vibration on a bending beam
- [2] elastic bending beam with sliding weights
- [3] bending beam can be mounted on all four sides of the frame
- [4] amplitude measurement via strain gauge and measuring amplifier
- [5] measuring results displayed on a PC
- [6] fixable length scale
- [7] storage system for parts
- [8] GUNT software for data acquisition via USB under Windows 7, 8.1, 10

Technical data

Bending beam

- LxWxH: 635x20x3mm
- material: AlMgSi0,5F22

Weights

- 10x 100g

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase

120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 720x480x180mm (storage system)

Weight: approx. 14kg (total)

Required for operation

PC with Windows

Scope of delivery

- 1 bending beam
- 1 measuring amplifier
- 1 set of weights
- 1 storage system with foam inlay
- 1 GUNT software CD + USB cable
- 1 set of instructional material

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Experimental set free vibration of a bar

Required accessories

022.11200 SE 112 Mounting frame