

TM 150 Vibration trainer

Vibration theory requires a good understanding of mathematical and physical relations. In technical professions, knowledge of vibration theory is essential. Illustrative experiments are offered to make it easier for students to understand the principles.

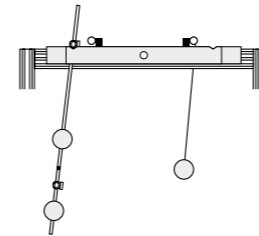
The TM 150 vibration trainer developed especially for this demanding field allows conducting experiments on a variety of vibration-related topics.

- pendulum swings
- spring-mass systems
- free and forced vibration
- damped vibrations
- beam vibrations
- dual-mass systems and dynamic vibration absorbing effects

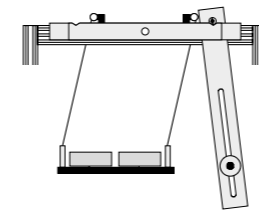
TM 150 Vibration trainer



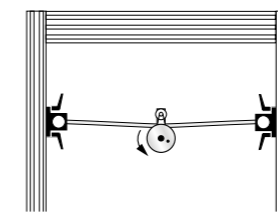
To study **pendulums**, the trainer includes different pendulum versions and a pendulum bearing:



- 2 gravity pendulums with steel and wooden ball
- 2 rod pendulums with adjustable masses and knife-edge bearings



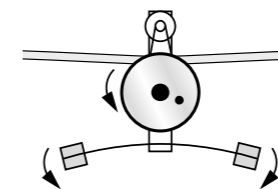
- 1 wooden physical pendulum with adjustable masses and knife-edge bearing
- 1 pendulum with bifilar suspension and different masses



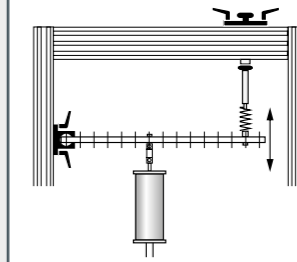
Investigation of **forced vibration** by an imbalance exciter; controllable frequency and imbalance exciter amplitude



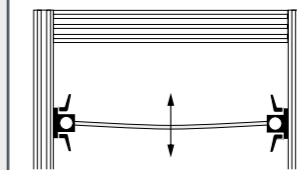
Tunable vibration absorber for investigating **vibration-absorbing effects**



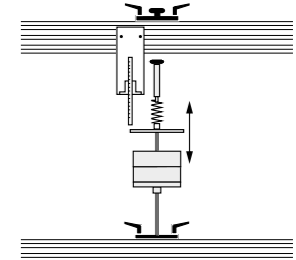
Two bar types available in the **bar-type oscillator**:



Rigid bar as discrete rotational oscillator, fixed support, suspension on a helical spring. A breadboard allows the attachment of springs, exciters and absorbers in a wide variety of reproducible configurations.



Elastic bar as oscillating continuum, either fixed or movable support, ball-bearing-mounted for minimal system damping



Investigation of a **spring-mass system** with

- height-adjustable spring holder
- bracket for holding different masses
- helical springs with varying spring stiffness
- vernier calliper to measure deflection



Damped vibration via an adjustable viscous damper with very low Coulomb friction

TM150.20 System for data acquisition

- analysis of vibration signals on a PC
- frequency and phase response curves
- all principal functions of a digital storage oscilloscope
- frequency spectra of the signals
- comprising software, a displacement sensor, a reference sensor and an interface box
- the interface box supplies up to three sensors, prepares their measuring signals for the PC and offers them to three analogue outputs for display



Accessories set TM 150.02



Torsional vibrations play a key role in drive systems and must be controlled to avoid damage. The TM 150.02 accessories set can be used to produce **free and damped torsional vibrations** and to study the effects of torsional stiffness, mass and damping on frequency and amplitude.

The range of experiments includes

- torsional stiffness
- mass moment of inertia
- free torsional vibrations
- damped torsional vibrations
- oscillator with several masses

For technical details on the **TM 150.02** unit, please see chapter 4.



All parts of the system are ready at hand and securely housed in a storage system.