TM 150.02

Free and damped torsional vibrations

The illustration shows the accessory kit TM 150.02 together with TM 150.

Description

- **influence of mass, torsional rigidity and damping on the behaviour of a rotary oscillator**

Torsional vibrations play a major role in drive systems. Selecting an inappropriate natural frequency can lead to resonance phenomena, which in some circumstances may lead to serious damage.

The TM 150.02 unit can be used to produce free torsional vibrations and to study the effects of torsional stiffness, mass and damping on frequency and amplitude. The accessory kit is designed to be installed in the TM 150 or TM 155 vibration trainers.

The accessory kit contains three different torsion bars and different mass disks with which to create torsional vibrations.

The rigidity of the torsion bars can be adjusted by selecting the effective length of the bar, such that the natural frequency of the torsional vibration can be adjusted within wide limits.

Bearings and mass disks are clamped to positions on the torsion bars using clamping chucks. An oil damper is used to display damped vibrations. The vibrations are recorded on the TM 150/TM 155 recorder.

Learning objectives/experiments

- natural frequency of a rotary oscillator
- influence of torsional stiffness, mass and damping

Specification

[1] supplementary experiment for torsional vibrations for the TM 150 and TM 155 vibration trainers
[2] 3 torsion bars with different diameters, freely selectable effective length
[3] 3 mass disks with clamping chuck
[4] 3 bearing blocks with ball bearings and clamping chuck
[5] oil damper for damped vibrations
[6] recorder for recording the vibrations in TM 150/TM 155

Technical data

Torsion bars, stainless steel
- Ø 3mm, 5mm, 6mm
- length: 800mm

Mass disks
- 2x small: Ø 150mm approx. 2,7kg
- 1x large: Ø 228mm approx. 4,8kg

Clamping chuck: Ø 0,5...8,0mm

LxWxH: 480x240x1180mm
Weight: approx. 33kg

Scope of delivery

1 experimental unit
3 torsion bars
3 mass disks
3 bearing blocks
1 oil damper
1 set of instructional material

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Required accessories

TM 150	Vibration trainer
or	
TM 155	Free and forced vibrations