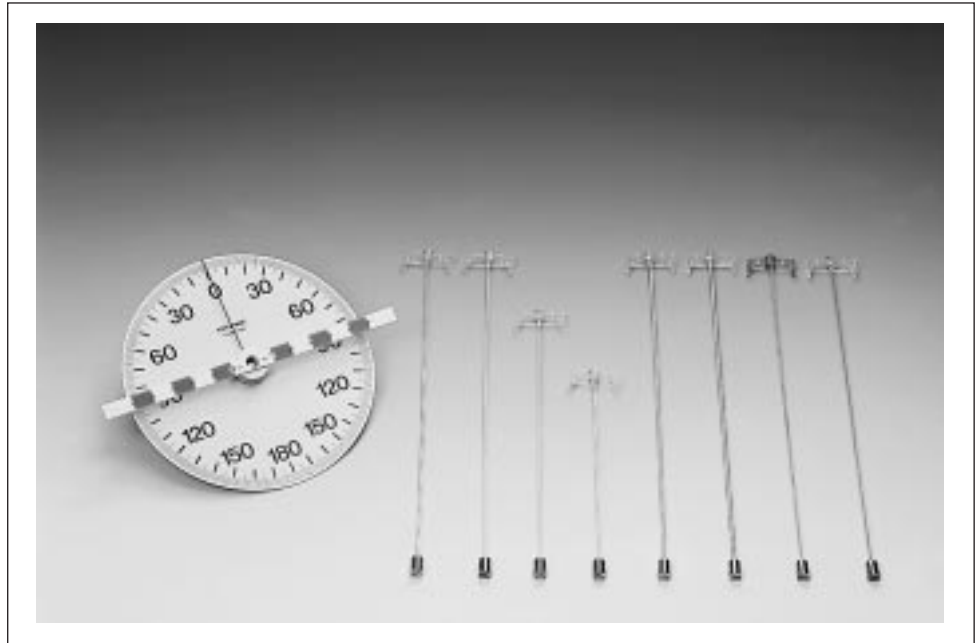


Operating Instructions



1 PURPOSE AND DESCRIPTION

Torsion forces and torsion oscillations can be investigated with the torsion apparatus. It consists of a low-friction rotating lever bar supported in bearings with pointer and angular demonstration scale.

2 SET-UP AND OPERATION

The torsion apparatus is held in a „PASS“ support base (see illustration). The individual torsion rods are pushed onto the lever bar and clamped at their end with a „PASS“ right-angle clamp. The pins on the lever bar are fitted at intervals of 2.5cm and provide points of application for a dynamometer. Apart from when conducting hysteresis experiments, the rods should not be twisted so far that the zero point is displaced.



3 EXPERIMENTS WITH THE TORSION APPARATUS

- *Torque*
The term „torque“ can be introduced and impressively demonstrated using the torsion apparatus. Apart from the lever bar itself, the angle between the force and the lever bar can be varied. The semi-circular scale with pointer is the preferred method for indicating this angle (see e.g. Experiment M 3.2 in „Physics in Demonstration Experiments, Issue A/B, Mechanics“). The steel rod is ideally suited for these experiments, because it has a large elastic region.
- *Angular directional quantity, modulus of transverse elasticity*
With one set of torsion rods of different thickness, length and material, the dependence of the angular direction quantity on the rod shape and material can be investigated and the modulus of transverse elasticity, which is solely dependent on the material, can be introduced.
- *Torsion oscillations*
To increase the period of oscillation during torsion oscillations two sliding weights are symmetrically pushed on the lever bar and screwed tight. The steel rod is also ideally suited to this experiment.
- *Hysteresis*
A hysteresis characteristic can be recorded using the copper torsion rod.

4 EXPERIMENT LITERATURE

Physik in Demonstrationsversuchen, Ausgabe A/B, Mechanik	01141.21
Versuchseinheiten Physik, Mechanische Schwingungen	16050.01
Experimental literature HP-P-L	00067.72

5 LIST OF EQUIPMENT

Torsion Rod, Steel, $d=2\text{mm}$, $l=500\text{mm}$	02421.01
Torsion Rod, Al, $d=2\text{mm}$, $l=500\text{mm}$	02421.02
Torsion Rod, Al, $d=2\text{mm}$, $l=400\text{mm}$	02421.03
Torsion Rod, Al, $d=2\text{mm}$, $l=300\text{mm}$	02421.04
Torsion Rod, Al, $d=3\text{mm}$, $l=500\text{mm}$	02421.05
Torsion Rod, Al, $d=4\text{mm}$, $l=500\text{mm}$	02421.06
Torsion Rod, Brass, $d=2\text{mm}$, $l=500\text{mm}$	02421.07
Torsion Rod, Copper, $d=2\text{mm}$, $l=500\text{mm}$	02421.08
Sliding Weight	03929.00
Semi-circular Scale with pointer	08218.00