

# TM 122

## Equilibrium of moments on a differential pulley block



### Description

#### ■ demonstration of power savings on the differential pulley block

The TM 122 experimental unit illustrates the equilibrium conditions on a differential pulley block. The relation between pulley diameter, lifting force and torque is demonstrated.

Three pulleys with different diameters are mounted on a shaft, which is itself mounted on ball bearings. Weights can be hung on the cables.

The forces act on the one hand directly on the periphery of the pulley with the largest diameter and another force acts on the pulley with the smaller diameter via a loose roller. Using weights, it is possible to vary these forces until equilibrium is reached.

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

### Learning objectives/experiments

- fundamentals of the equilibrium of moments: acting forces, generated moments and equilibrium
- relation between power savings and cable route

### Specification

- [1] investigation of the equilibrium of moments on a differential pulley block
- [2] anodised aluminium pulleys
- [3] 1 loose roller
- [4] ball bearing-mounted steel shaft
- [5] bracket for wall mounting

### Technical data

#### Pulleys

- $\varnothing=250\text{mm}$
- $\varnothing=100\text{mm}$
- $\varnothing=50\text{mm}$

#### Loose roller

- $\varnothing=75\text{mm}$

#### Weights

- 2x 1N (hanger)
- 4x 0,5N
- 4x 1N
- 4x 2N
- 4x 5N

Base plate, WxH: 300x250mm

LxWxH: 300x280x250mm

Weight: approx. 14kg

### Scope of delivery

- 1 experimental unit
- 1 set of weights
- 2 cables
- 1 set of instructional material