

# FL 111

## Forces in a simple bar structure



### Description

#### ■ resolution of forces in simple bar structures

FL 111 represents a simple bar structure. In the single plane system the bars are only subjected to compression and tension. Loads are applied only to the nodes.

The unit comprises three bars that are joined together using disks such that the joints are free to move. A longitudinally adjustable bar permits the bar structure to be constructed with different angles. The bars engage in the disks by snaplocks. Two of the node disks also form the supports (fixed and movable) and are clamped to the sturdy aluminium section base frame. The external load is applied to the upper nodal point by means of weights.

The bar forces occurring are measured by the deformation of leaf spring elements in the middle of the bar.

### Learning objectives/experiments

- measurement of bar forces
- calculation of bar forces by the method of joints
- comparison: measuring result – calculation – graphical method

### Specification

- [1] resolution of forces in a single plane, statically determinate system
- [2] 3 node disks, 2 of which serving as supports
- [3] 3 bars, each fitted with a leaf spring element and dial gauge
- [4] 2 fixed bar lengths, 1 variable bar length
- [5] 5 different angles adjustable between bars
- [6] storage system to house the components

### Technical data

#### Bars

- fixed bar: L=440mm
- adjustable bar: L=440, 622, 762mm

#### Angle between bars

- 60°-60°-60°/45°-90°-45°
- 30°-120°-30°/30°-30°-120°

#### Dial gauge

- measuring range: 0...10mm
- graduation: 0,01mm

#### Weights

- 1x 1N (hanger)
- 1x 10N
- 2x 20N

#### Leaf spring element

- force measuring range: 0...50N

LxWxH: 900x200x600mm

Weight: approx. 15kg

LxWxH: 1170x480x178mm (storage system)

### Scope of delivery

- 1 frame
- 3 bars
- 3 node disks
- 3 dial gauges
- 1 set of weights
- 1 storage system with foam inlay
- 1 set of instructional material

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Optional accessories

020.30009

WP 300.09

Laboratory trolley