FL 111 Forces in a Simple Bar Structure

* Resolution of forces in simple bar structures

Technical Description

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 members that are joined together using discs 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 discs by snap-locks. Two of the node discs also form the supports (fixed and free) 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. The method of joints enables the bar forces to be determined by formulating a system of equations.

Learning Objectives / Experiments

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

Scope of Delivery

1 frame, 3 bars, 3 node discs, 3 dial gauges, 1 set of loads, 1 storage system with foam inlay, 1 set of instructional material

Specification

[1] resolution of forces in a single plane, statically determinate system
[2] 3 node discs, 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, graduations: 0,01mm

Load: 1x 1N (hanger), 1x 10N, 2x 20N
Leaf spring element: force measuring range 0...50N

Dimensions and Weight

LxWxH: 900x200x600mm
Weight: approx. 15kg
LxWxH: 1170x480x178mm (storage system)

Order Details

021.11100	FL 111	Forces in a Simple Bar Structure