BENDING MOMENT APPARATUS

HFC5

Features

- Visually realistic, 'cut' beam
- Takes internal forces and shows them externally
- Bending Force output via load cell
- Unrestricted loading positions
- Load position at 'cut' in beam
- Optional Influence line section (with optional HFC5A)

Description

A length of material supported horizontally and carrying vertical loads is called a beam. The loading causes bending and transverse shearing. The loads and reactions are the 'external' forces acting on the beam. They must be in equilibrium. However, the strength of the beam depends on 'internal' forces or moments. This experiment demonstrates the nature of these internal forces and their dependence on the external system of forces. The experimental beam has been ‘cut’ into two parts and joined together by a pair of low friction precision ball bearings. An underslung spring balance provides a resisting moment, and also allows the section bending moment to be measured. When load is applied to the beams the spring balance is adjusted by means of a thumb knob so that each beam is brought to a horizontal resting position. The bending moment force can then be recorded. Load is applied to the beams by the use of calibrated test weights and three specially designed hangers which have a single point contact on the beam and can be positioned anywhere along the working length of the beam section. The beam is simply supported on end pins. The apparatus is quick and easy to set-up on a bench top and takes up little space. It is a visual experiment and different loadings can be applied accurately and quickly. A hinged metal strip (HFC5A) to simulate the loading pattern of panelled girder for a more advanced experiment on influence lines is optionally available. This unit forms part of a range of analogue experiments for statics study, aimed at the value end of the market, where the focus is on manual data recording.

Related Laws/Applications

- Bending Moment
- Strain
- Stress
- Young's' Modulus
- Bending Moment Diagrams (BMD)
- Verification of Equilibrium of Vertical Forces and Moment

Learning capabilities

- Visual demonstration of shear force at a ‘cut’ in a beam
- Comparison of experimental results with theory
- Creation and use of shear force diagrams
- Shear force variation with differing load points, positions and arrangements

Technical Specification

- Beam lengths of 650 and 350mm
- Beam cross section: 51 x 38mm
- 50mm graduations on beams
- Weights set: 3 x 2N, 3 x 5N, 3 x 10N

What’s in the Box?

- 1 x Long Beam Assembly (660mm)
- 1 x Short Beam Assembly (330mm)
- 2 x Support Rod Assembly
- 3 x Weight Hangers
- 3 x Pin (For hanger assemblies)
- 1 x Tape Measure
- 1 x Spirit Level
- 1 x Weight Set Containing - 3 x 2N, 3 x 5N, 3 x 10N
- 1 x Spring Balance 6 kg

You might also like

- HST10 - Bending Moment in a Beam
- HFC4 - Shearing Force Apparatus
- HSM10 - Curved Bar Apparatus
- HSM15 - Critical Condition of Struts
- HSM30 - Unsymmetrical Cantilever Apparatus

Weights & Dimensions

- Net Weight: approx. 5kg (excluding weights)
- Net Dimensions: approx. 1050 (L) x 300(W) x 300(H) mm

Operational Conditions

- Storage temperature: -10°C to +70°C
- Operating temperature range: +10°C to +50°C
- Operating relative humidity range: 0 to 95%, non-condensing

Ordering information

To order this product, please call PA Hilton quoting the following codes:
HFC5 - Bending Moment Apparatus
HFC5A - Loading Device for Influence Line