H2 Stability of a Floating Body

Shows how to find the metacentric height of a floating body. Allows full investigations into theoretical predictions.

- Full and accurate experimental analysis
- Ideal for classroom demonstrations
- Bench-mounted
- No services required
- Compact and requires minimal storage space

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H2 Stability of a Floating Body

Description

Determination and analysis of the stability of floating bodies, such as ships, rafts and pontoons, is important throughout many branches of engineering. This experiment allows students to determine the stability of a pontoon with its centre of gravity at various heights. They can then compare this to predictions calculated from theory.

The experiment consists of a rectangular pontoon floating in water. Plastic materials and corrosion-resistant finishes throughout the equipment give the fullest possible protection against corrosion.

The pontoon has a plastic sail with five rows of slots. These rows are at equally spaced heights on the sail. The slots are equally spaced around the centre line.

To change the centre of gravity and the tilt (list) angle of the pontoon, students fit an adjustable weight into one of the slots. A plumb line from the top centre of the sail and a scale below the base indicate the tilt angle. Students obtain fore and aft balance by positioning two small magnetic trim weights on the bottom of the pontoon.

Standard Features

- Supplied with comprehensive user guide
- Five-year warranty
- Made in accordance with the latest European Union directives

Experiments

Determination of the metacentric height, and thus the metacentre, of a floating pontoon. This is by graphic analysis of the angles of tilt of the pontoon with various centres of gravity.

Operating Conditions

Operating environment:
Laboratory

Storage temperature range:
–25°C to +55°C (when packed for transport)

Operating temperature range:
+5°C to +40°C

Essential Services

Floor space needed:
Approximately 700 mm x 500mm of solid, level bench worktop

Specification

Dimensions:
Nett: 650 mm x 450 mm x 350 mm; packed: 0.11 m^3

Weight:
Net: 5 kg; packed: 9 kg

Water tank:
Moulded plastic, nominally 600 mm x 400 mm x 120 mm

Floating pontoon:
360 mm x 203 mm x 76 mm

Angular tilt of pontoon:
Nominally 8° each side of the vertical centre line

Working height of sail:
240 mm

Adjustable sail weight:
525 g

Total weight of floating assembly:
Nominally 3.2 kg