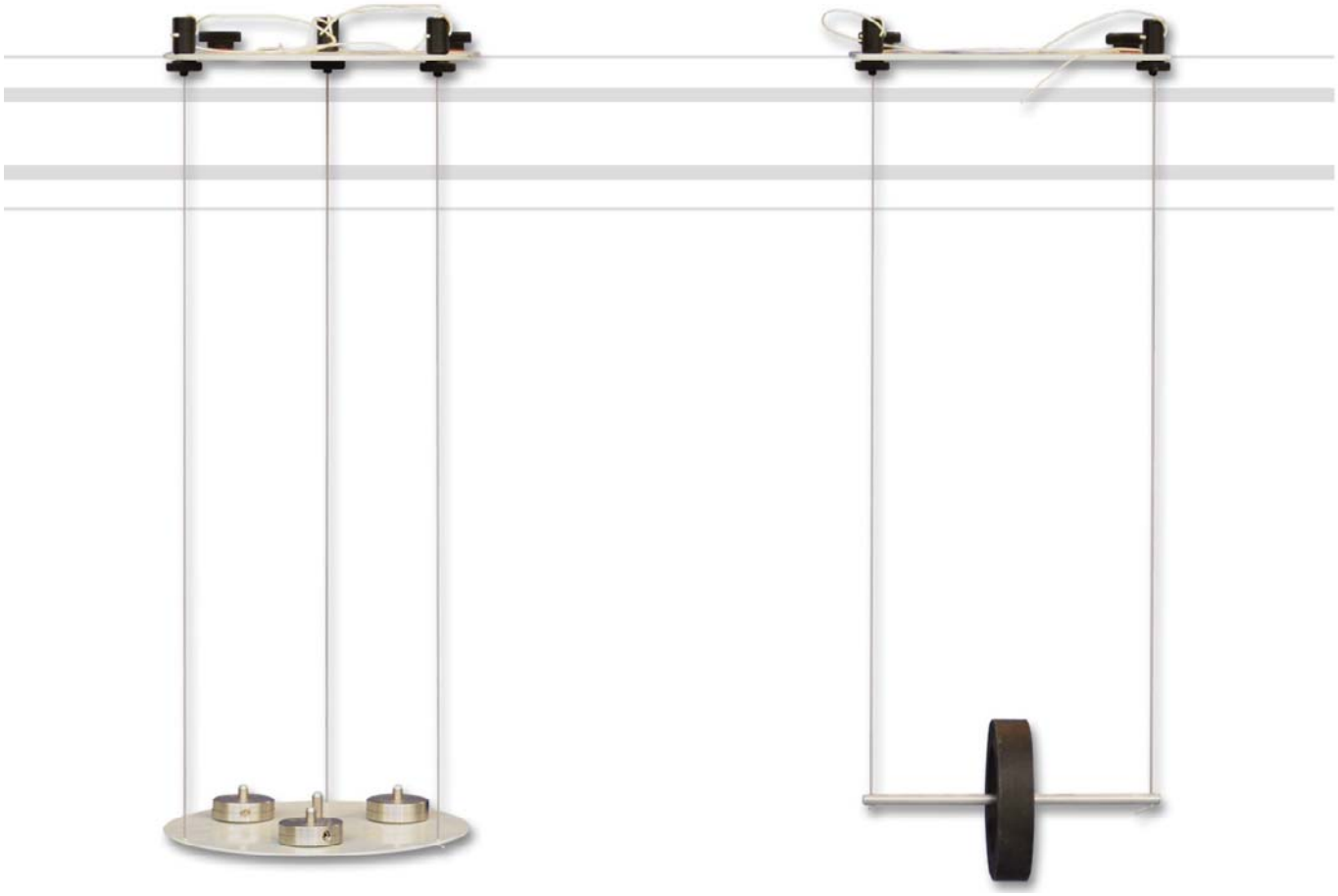
FILAR PENDULUMS

TM162

Experiment for studying simple harmonic motion and the factors that affect the period of oscillation of bifilar and trifilar pendulums. Fits on to the Free Vibrations test frame.



KEY FEATURES

- One of a series of modular experiments that explore free vibrations in simple systems
- Quick, safe, and easy for students to use, needing minimal lab supervision
- Includes two modules: a bifilar and a trifilar pendulum
- Different pendulums designs, lengths, mass and inertia for a range of experiments
- Contains all parts needed for the experiments including an 'example machine element', stopwatch, steel rule and simple tools
- Supplied with a CD-ROM containing 3D CAD (computer aided design) model files of the example machine element, for comparison of inertia found by experiments with that calculated by software

TECQUIPMENT LTD, BONSALL STREET, LONG EATON, NOTTINGHAM NG10 2AN, UK
TECQUIPMENT.COM +44 115 972 2611 SALES@TECQUIPMENT.COM

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DESCRIPTION

This product is part of a range that explores free vibrations in simple 'one degree of freedom' systems.

It introduces students to key scientific terms such as:

- Simple harmonic motion (SHM) and period of oscillation
- Mass moment of inertia
- Radius of gyration
- Axis of rotation
- Parallel axis theorem

This product fits to the sturdy test frame (TM160) for study or demonstration.

This product includes a rod and a circular plate to show the principles and use of simple harmonic motion theory in bifilar and trifilar pendulums. Two suspension plates fix to the top of the test frame to hold the bifilar and trifilar pendulums.

Bifilar and trifilar, meaning of two (bi) or three (tri) threads or wires.

Students test the two pendulums to see how different factors, such as mass, support position or pendulum length affect the period of oscillation. The theory shows how to predict the period of oscillation of a given pendulum for comparison with actual results. The module includes an 'example machine element' in the form of a flywheel with spokes. This machine element fits on each pendulum, rotating around two different axes of rotation. It helps to show how you may use a pendulum to predict the moment of inertia of a part rather than use extensive calculation and measurements.

TecQuipment provide a CD-ROM with the equipment. It contains 3D CAD (Computer Aided Design) model files of the example machine element used in the experiments. The files are in several formats for use with the most popular 3D CAD software packages. This allows students to compare a software predicted moment of inertia against that found by experiment.

NOTE: TecQuipment recommend that you have access to a computer with a suitable 3D CAD software package such as SolidWorks®, which can predict moment of inertia.

STANDARD FEATURES

- Supplied with lecturer guide and student guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives
- ISO9001 certified manufacturer

LEARNING OUTCOMES

- Cord length and period of bifilar and trifilar pendulums
- Cord (support) positions and period of bifilar and trifilar pendulums
- Mass and period of bifilar and trifilar pendulums
- Position of mass on bifilar and trifilar pendulums
- Finding moment of inertia of an 'example machine part' in two different axes

ESSENTIAL BASE UNIT

- Free Vibrations Test Frame (TM160)

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory

STORAGE TEMPERATURE RANGE:

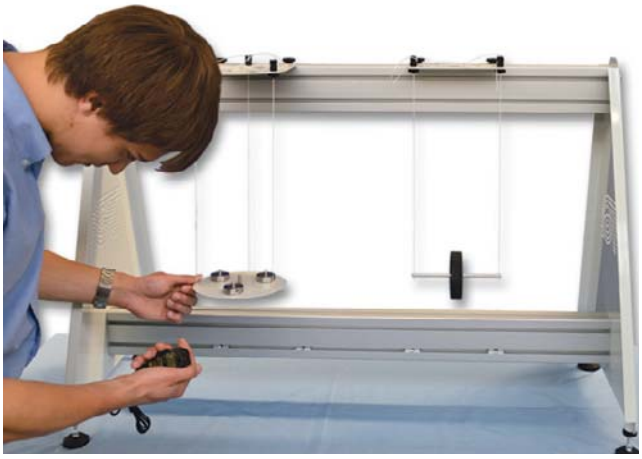
–25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C



THE FILAR PENDULUMS MODULE IN USE, SHOWN FITTED TO THE TEST FRAME (TM160)

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SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

NETT DIMENSIONS AND WEIGHT:

Assembled bifilar pendulum: maximum 600 mm high x 180 mm wide x 100 mm front to back

Assembled trifilar pendulum: maximum 600 mm high x 170 mm wide x 240 mm front to back

Total 2 kg

APPROXIMATE PACKED VOLUME AND WEIGHT:

0.02 m^3 and 2.5 kg

TOOLS AND OTHER PARTS INCLUDED:

- Hexagon tool
- Stopwatch
- Steel rule
- Set of 6 x 75 g masses