



AF17

FLOW VISUALISATION

Allows students to “see” the air flows around various shapes by using smoke filaments



- One of a series of eight experiment modules that fits to the Modular Air Flow Bench (AF10)
- Highly visual and motivating for students – brings fluid mechanics to life
- Toggle clamp connections to the Modular Air Flow Bench plenum chamber for quick and easy fitment
- Includes a set of differently shaped two-dimensional models
- Transparent fronted test duct, with clearly printed angular scale, allows the models to be clearly seen and accurately positioned
- Comes complete with ducting to allow the smoke to be easily and safely drawn away by the Modular Air Flow Bench

FLOW VISUALISATION

DESCRIPTION

This module consists of a specially-shaped duct which has a large working section with transparent window. The inlet of the duct is attached to the Air Flow Bench plenum chamber using quick-release clamps; the outlet is located into the bench exhaust. The duct has a rake of tubes from which filaments of smoke emerge and flow around two-dimensional models held in the working section. The smoke filaments can be made to visually show areas of steady and unsteady flow, thickening boundary layers, and separation. The rake is adjustable so that filaments can be made to contact the model surface at specific points of interest if desired.

The models are quickly and simply mounted, allowing the unit to be used for student project work.

The unit produces considerable amounts of smoke which is safe and non-toxic but, to avoid the air in the laboratory becoming saturated, the unit includes a length of flexible tubing that connects the Air Flow Bench exhaust to either a suitable opening to atmosphere, or to an existing fan extraction system.

NOTE: The smoke generator uses compressed carbon dioxide. Due to transport regulations the unit is shipped with an empty gas bottle that requires filling before use.

STANDARD FEATURES

- Supplied with a comprehensive User Guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives

ESSENTIAL BASE UNIT

- Modular Air Flow Bench (AF10)

LEARNING OUTCOMES

Demonstration of the flow patterns round a cylinder, flat plate, aerofoil and a sharp-edged orifice/slit.

ESSENTIAL SERVICES

ELECTRICAL SUPPLY:

100 VAC to 120 VAC 50 Hz to 60 Hz

220 VAC to 240 VAC 50 Hz to 60 Hz

EXHAUST SYSTEM FOR SMOKE:

Approximately 200 mm diameter opening to atmosphere or laboratory exhaust

SPECIFICATIONS

NETT DIMENSIONS AND WEIGHT:

Smoke Generator 410 mm x 180 mm x 370 mm and 14 kg

CO₂ GAS BOTTLE (EMPTY) AND BRACKET:

7.5 kg

SMOKE TUNNEL DUCT IN THREE PIECES INCLUDING WORKING SECTION:

10.5 kg

SMOKE OIL:

2.5 litre

PIPE AND EXHAUST DUCT:

2.5 kg

TOTAL NETT WEIGHT:

37 kg

APPROXIMATE PACKED DIMENSIONS AND WEIGHT:

0.32 m³; 42 kg

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