



Fluid Mechanics

MFP107

Axial Fan Module

Allows students to study and perform tests on an axial fan, to understand how it works and calculate its performance

Works with
VDAS[®]

Shown fitted with the
Universal Dynamometer
(MFP100)



Typical screenshot of the optional VDAS[®] software

- Part of TecEquipment's Modular Fluid Power range that connects with the Universal Dynamometer (MFP100) as a common motive power source for a cost-effective solution
- Allows students to study and test a popular type of rotodynamic machine safely and at a realistic scale
- Multiple pressure measurement points along the fan duct allow students to examine a full range of performance characteristics
- Connection plate with schematic diagram clearly shows the air flow circuit and how the parts of the module connect to each other
- A traversing, calibrated pitot tube allows investigations of velocity distribution
- Includes a digital multi-input pressure display
- Can be used with TecEquipment's Versatile Data Acquisition System (VDAS[®])
- Includes an efficient exhaust silencer to reduce noise

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- An ISO 9001 certified company
- VDAS is a registered trademark of TecEquipment Ltd

MFP107

Axial Fan Module

Description

For use with and driven by the Universal Dynamometer (MFP100, available separately), the Axial Fan Module is part of TecQuipment's Modular Fluid Power range. The Axial Fan Module is ideal for student experiments, demonstrations and projects.

Axial fans move air in a wide range of applications from ventilation in domestic and commercial buildings to mines and agriculture. For these reasons it is important for engineers to be able to study and understand the characteristics of axial fans.

The module has an axial fan mounted in a cylindrical steel duct. Air enters the duct through an inlet nozzle. The pressure at a set of tapings just downstream of the nozzle allows calculation of the inlet air flow rate. A slide-valve (downstream of the fan) controls flow rate and delivery pressure. Air exits the duct through a silencer to reduce noise in the laboratory.

TecQuipment's Universal Dynamometer measures the speed, torque and power of the axial fan. Two more sets of pressure tapping points measure the pressure difference across the fan. Each tapping point has three tapings arranged at 120-degree separation around the duct to give a good average value at that location. A traversing Pitot tube with a calibrated scale allows students to find the velocity distribution across the duct. The Pitot tube fits to a choice of two positions, to allow students to move it across the duct in two axes.

For quick and reliable tests, TecQuipment can supply its optional Versatile Data Acquisition System (VDAS®). This gives accurate real-time data capture, monitoring and display, calculation and charting of all the important readings on a computer (computer not included). VDAS® will also log the position of the optional Pitot-Static Traverse (MFP107a).

Standard Features

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

Experiments

- Characteristics of an axial fan, including head against flow efficiency
- Relationship between power and speed (Power Law)
- Velocity distribution in a round duct
- Calibration of an inlet nozzle
- Duct resistance and matching to fan to find operating point

Essential Base Unit

- Universal Dynamometer (MFP100)

Recommended Ancillaries

- Frame-mounted version of the Versatile Data Acquisition System (VDAS-F)
- Pitot Static Traverse – 450 mm (MFP107a)

Essential Services

Electrical supply (for the MFP100):
Single-phase 230 VAC, 50 Hz at 20 A
Two-phase 220 VAC, 60 Hz at 20 A

Floor space needed:
2300 mm x 1060 mm for the module plus an additional 3 m at the inlet and outlet for correct results, and 2 m to the front of the module for students to work safely. This gives a recommended minimum floor space of 8.3 m x 3.06 m.

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

Specifications

Nett dimensions and weight (assembled):
2300 mm x 1060 mm x 1530 mm and 200 kg

Packed volume and weight:
2.4 m³ and approximately 300 kg

Power, speed and torque measurement:
From Universal Dynamometer (MFP100)

Flow rate: 1.7 m³.s⁻¹

Nominal Fan Diameter: 400 mm

Pressure measurement:
Electronic transducers and digital display

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Axial Fan Module

Description - MFP107a

The Pitot-static traverse is an ancillary to TecEquipment's Axial Fan Module (MFP107). It fits in place of the standard pitot traverse of the MFP107.

It has a digital indicator that shows the Pitot position across the duct, and allows connection to the optional VDAS® software to log the Pitot position.

The digital indicator has a zero button to allow the user to set the datum or starting point to any position during an experiment.



Ancillary For:

- Axial Fan Module (MFP107)

Specifications

Approximate Packed Dimensions: 0.01 m³ and 3 kg

Total travel: 450 mm

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