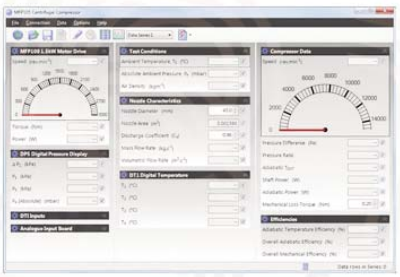
MFP105 Centrifugal Compressor Module

Allows students to study and perform tests on a centrifugal compressor: to understand how it works and calculate its performance

Works with VDAS®



Screenshot of the optional VDAS® software

- Centrifugal compressor, mounted in a mobile frame with full instrumentation
- Part of TecQuipment'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 common type of rotodynamic machine, safely and at a realistic scale
- Pressure and temperature measurements at key points in the system
- Connection plate with schematic diagram clearly shows the arrangement of the module
- Fully variable speed, for a range of test results
- Includes digital displays of pressure and temperature
- Connects to TecQuipment's optional Versatile Data Acquisition System (VDAS®)

- TecQuipment Ltd, Bonsall Street, Long Eaton, Nottingham NG10 2AN, UK
- **T** +44 115 972 2611 • **F** +44 115 973 1520 • **E** info@tecquipment.com • **W** www.tecquipment.com
- An ISO 9001 certified company
- VDAS is a registered trademark of TecQuipment Ltd

TecQuipment

MFP105 Centrifugal Compressor Module

Description

For use with the Universal Dynamometer (MFP100), the Centrifugal Compressor Module is part of TecQuipment's Modular Fluid Power range. This range examines and explains fluid power machines. The Centrifugal Compressor Module is ideal for student experiments, demonstrations and projects.

Centrifugal compressors are common machines, used for forced ventilation in applications that need a good volume of air at a reasonable pressure - for example: forced ventilation and cooling systems.

The module consists of a compressor and instrumentation, all mounted on a robust, mobile trolley for ease of use. The module is for use with and driven by TecQuipment's Universal Dynamometer (refer to MFP100 datasheet). The Universal Dynamometer measures the speed, torque and power absorbed by the compressor. Speed is fully variable up to the maximum allowable for the compressor. Air enters the compressor through a shaped nozzle, used to measure the airflow rate. The air then moves past a hand operated delivery valve and out to atmosphere. The delivery valve controls the airflow rate (and therefore delivery pressure).

Electronic transducers measure the inlet pressure, delivery pressure, nozzle differential pressure (flow rate) and the atmospheric (barometric) pressure. Thermocouples measure inlet, outlet and ambient temperatures. Digital displays show all the readings.

For quick and reliable tests, TecQuipment can supply the optional VDAS (Versatile Data Acquisition System). VDAS gives accurate real-time data capture, monitoring and display, calculation and charting of all the important readings on a computer. The computer is not supplied.

Standard Features

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

Experiments

- Performance of a compressor
- Variation of compressor performance with speed
- Investigation of non-dimensional characteristics
- Comparison of performance with that of an ideal adiabatic system

Essential Base Unit

- Universal Dynamometer (MFP100)

Recommended Ancillaries

- VDAS-F (frame mounted version of the Versatile Data Acquisition System)

Essential Services

Electrical supply (for the Universal Dynamometer):
Phase to neutral 230 VAC, 50 Hz at 20 A

Phase to phase 220 VAC, 60 Hz at 20 A

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

Dimensions: (assembled): 1300 mm (Length) x 1620 mm (Height) x 900 mm (Depth)

Nett Weight: 100 kg (including two instruments)

Power: 1.5 kW (from Universal Dynamometer)

Instruments and Measurements

- Pressures: Piezoelectric transducers and digital display
- Flow rate: Nozzle and pressure transducer
- Torque, speed and power: Measured and displayed digitally by the Universal Dynamometer (MFP100)
- Temperatures: K-type thermocouples and digital display

Note - outlets on the Control and Instrumentation Unit of the Universal Dynamometer supply electrical power for the digital displays.

Sound Levels

This fan generates localised noise levels greater than 85 dB(A). **You must wear ear defenders when you use it.**

- TecQuipment Ltd, Bonsall Street, Long Eaton, Nottingham NG10 2AN, UK
- **T** +44 115 972 2611 • **F** +44 115 973 1520 • **E** info@tecquipment.com • **W** www.tecquipment.com
- An ISO 9001 certified company
- VDAS is a registered trademark of TecQuipment Ltd

TecQuipment