

Centrifugal Compressor Demonstration Unit – FM42

**STAINLESS STEEL CONSTRUCTION WITH TRANSPARENT TEST SECTION
CONTROL AND DATA LOGGING VIA PC
SIMPLE USB CONNECTIVITY**

Multi-stage compressors are used industrially for high pressure deliveries of gas flows or suction duties.

The kinetic energy imparted to the gas by the impeller rotation is converted into pressure energy which progressively increases from stage to stage.



Description

A motor driven multi-stage centrifugal compressor mounted on a stainless steel plinth with transparent air inlet and air outlet ducts. A manually operated adjustable aperture allows the air flow rate to be varied at constant fan speed. A calibrated orifice plate is used on the discharge to measure the air flow rate.

Electronic sensors measure the pressure head developed across the blower, the pressure across the orifice plate (and hence the flow rate) and the air temperature.

The compressor speed is accurately controlled by an advanced electronic inverter within the IFD7 (an essential accessory). This inverter also calculates the torque produced at the motor drive shaft allowing the power used by the fan to be derived. The IFD7 also provides the conditioning electronics for the sensors and allows their readings to be displayed on the computer software.

Requirements

Scale



- ▶ Armfield IFD7
- ▶ Software requires a computer running Windows XP or above with a USB port (computer not supplied by Armfield)

Armfield IFD7 Interface Unit



Technical specifications

Max flow rate:	20 l/s typical
Max head:	6.0kPa
Max fan speed:	3,000rpm
Motor power rating:	250W
Number of stages:	7
Pressure sensor:	0 to 12.5mBar

Overall dimensions

Length	0.88m
Width	0.51m
Height	0.95m

Packed and crated shipping specifications

Volume	0.75m ³
Gross weight	100kg

Demonstration capabilities

- ▶ Measurement of constant speed machine performance in terms of static and total pressures, rotor speed and motor shaft power, as a function of inlet flow
- ▶ Measurement of compressor efficiency and estimation of impeller power efficiency
- ▶ Measurement of performance at constant speeds
- ▶ Introduction to similarity laws for scale-up
- ▶ Comparison of student calculations with computer results

Software

The ArmSOFT software enables the operator to control the compressor speed 0 to 100%. Feedback from the sensors is then displayed in real time for the end user with simultaneous data logging.

The data trend is also displayed graphically in real time and can be exported to another platform such as Excel for further analysis.

Essential accessories / equipment

- ▶ Armfield IFD7

Ordering specification

- ▶ A small-scale multi-stage centrifugal compressor demonstration unit, comprising an inlet duct, the compressor, an outlet duct and an adjustable aperture, all mounted on a stainless steel base
- ▶ Seven stages in the compressor
- ▶ Equipped with electronic measurement sensors for head pressure, flow rate (via orifice plate) and air temperature
- ▶ Capable of being linked to a PC (not supplied) via a USB interface console (an essential accessory), which does not require internal access to the computer. Also enables interfacing to other software packages
- ▶ Supplied with software providing full instructions for setting up, operating, calibrating and performing the teaching exercises. Facilities for logging, processing and displaying data graphically
- ▶ Offers a complete teaching package of coursework and laboratory investigation

Ordering codes

- ▶ FM42
- ▶ IFD7-A: 220-240V / 1Ph / 50Hz
- ▶ IFD7-G: 220-240V / 1Ph / 60Hz

Armfield standard warranty applies with this product

Knowledge base

- > 28 years' expertise in research & development technology
- > 50 years' providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

An ISO 9001:2015 Company



armfield.co.uk

Aftercare

Installation
Commissioning
Training
Service and maintenance
Support: armfieldassist.com