

Series and Parallel Pumps Demonstration – FM51

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

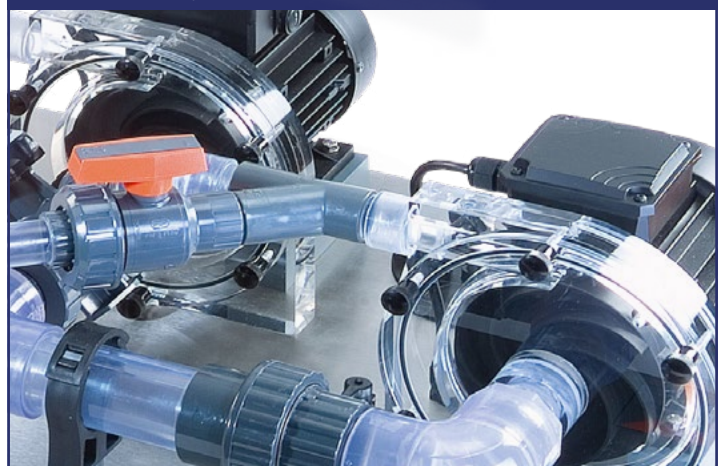
Two motor-driven centrifugal pumps mounted on a stainless steel plinth with a water reservoir and pipework for continuous circulation. The pumps can be configured for single pump operation, two pumps in parallel or two pumps in series by using manually operated ball valves. Similarly, manual valves are used to control the flow and facilitate the study of suction effects, including demonstration of air release.



Software screen shot



Twin centrifugal pumps



Description

In parallel operation the two pumps draw from a shared inlet pipe of a wider diameter than the pump inlet, reflecting a typical industrial configuration of parallel pumping.

Each pump has impellers that can be easily accessed and replaced without tools. The FM51 is delivered with three impellers in total, one with forward curved blades and two with backward curved blades, allowing the students to investigate the effects of impeller characteristics.

Electronic sensors measure the pump outlet pressure of each pump, the shared pump inlet pressure, the flow rate and the water temperature.

The pump speed of the first pump is accurately controlled by an advanced electronic inverter within the IFD7 (an essential accessory) and can be varied over the full range.

The inverter also calculates the torque produced at the motor drive shaft, allowing the power used by the pump to be derived. The second pump runs at inherent motor speed.

This combination of control facilities allows a wide range of different configurations to be investigated.

Demonstration capabilities

- ▶ Demonstration of series, parallel and single pump operations
- ▶ Measurement of constant-speed pump performance including production of characteristic curves (one pump)
- ▶ Comparison of head-flow characteristics with single pump operation at inherent speed
- ▶ Investigation of impeller styles
- ▶ Comparison of student calculations with computer results

Armfield IFD7 Interface Unit



Requirements

Scale



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

Software

The ArmSOFT software enables the operator to control the pump 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

Technical specifications

Max flow rate:	2.2 l/s (parallel pumping, both pumps 50Hz)
Max head:	6.0m (single pump) 12.0m (series)
Pump speed:	1,800rpm (pump 1) 1,500rpm (pump 2)

Overall dimensions

Length	1.01m
Width	0.58m
Height	0.59m

Packed and crated shipping specifications

Volume	1.40m ³
Gross weight	120kg

Ordering specification

- ▶ A small-scale centrifugal pump demonstration unit comprising of a water reservoir, the two pumps, control valves and interconnecting pipework all mounted on a stainless steel base
- ▶ Equipped with electronic measurement sensors for pump head pressure, suction, flow rate and water temperature
- ▶ Transparent pump volute for visibility
- ▶ 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

- ▶ FM51
- ▶ 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



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