

**Plunger Pump Demonstration Unit – FM53**

Issue: Provisional

**FM**  
SERIES

The FM53 replicates a plunger pump as used in industry to pump small quantities of liquid at high pressures. Electronic sensors measure the instantaneous cylinder pressure within the pump, the pump displacement and the cumulative flow.

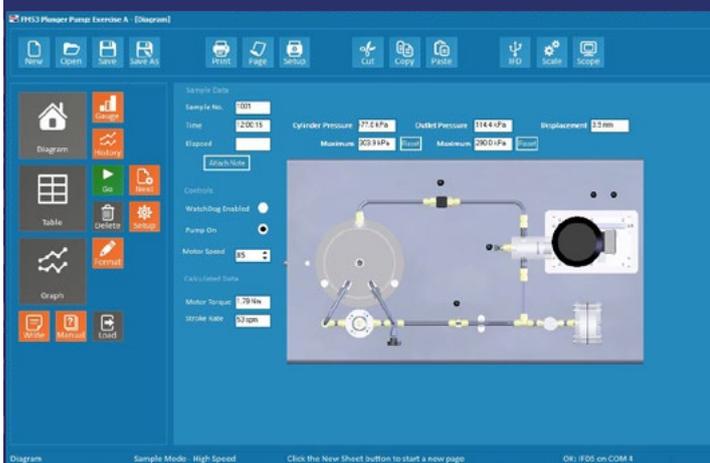
**STAINLESS STEEL CONSTRUCTION WITH TRANSPARENT TEST SECTION**  
**CONTROL AND DATA LOGGING VIA PC**  
**SIMPLE USB CONNECTIVITY**

The plunger or ram pump is a positive displacement pump and is used for pumping small quantities of liquid at high pressure. It is similar to a piston pump except that the sealing gland is at one end of the cylinder.

The reciprocating motion of the plunger gives an uneven flow, although the inclusion of a damping vessel can reduce this effect. Priming is unnecessary.



**Software screen shot**



**Clear view of the plunger pump**



## Description

A motor-driven plunger pump, mounted on a stainless steel plinth with a water reservoir, pulsation damper and pipework for continuous circulation.

The pump head, measuring tank, pulsation damper and the water reservoir are manufactured from clear acrylic for maximum visibility. The pump outlet is connected to both a sprung loading valve and a needle valve to investigate different loading characteristics.

A pressure relief valve protects the operator and the equipment. An additional valve can be used to isolate or include the pulsation damper, allowing the effect of damping to be investigated.

Electronic sensors measure the instantaneous cylinder pressure within the pump, the pump displacement and the cumulative flow over a period of time.

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)

## Technical details

<b>Max flow rate:</b>	0.725 l/m typical
<b>Max head:</b>	4 bar
<b>Swept volume:</b>	15mm stroke x 32mm diameter
<b>Pumping speed:</b>	0 to 60 strokes/min
<b>Motor power rating:</b>	250W
<b>Pressure Sensor:</b>	0 to 100psi
<b>Piston Sensor:</b>	-9 to 16mm
<b>Motor Torque range:</b>	0 to 2.1Nm

## Overall dimensions

Height:	0.41m
Width:	0.88m
Depth:	0.51m

## Packed and crated shipping specifications:

Volume:	1.0m <sup>3</sup>
Gross weight:	120kg

## Demonstration capabilities

- ▶ Measurement during each pump cycle of:
  - Plunger displacement
  - Cylinder pressure
  - Pump outlet pressure
- ▶ On-line p-V diagram displays
- ▶ Measurement of volumetric efficiency
- ▶ Measuring the effect on pump performance of:
  - Sprung loading valve or needle valve
  - Adjusting the outlet loading valve
  - The inclusion of a pulsation damper vessel

## 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

## Ordering specification

- ▶ A small-scale plunger pump demonstration unit comprising of a water reservoir, pump, control valve, relief valve and interconnecting pipework, all mounted on a stainless steel base
- ▶ Includes both a sprung loading valve and a needle valve for loading the pump
- ▶ Equipped with electronic measurement sensors for cylinder pressure, plunger position, pump outlet pressure and cumulative flow
- ▶ Pulsation damping facility
- ▶ Transparent pump head 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

- ▶ FM53
- ▶ IFD7-A: 220-240V / 1Ph / 50Hz
- ▶ IFD7-G: 220-240V / 1Ph / 60Hz

## Warranty

Armfield standard warranty applies with this product

## Knowledge base

- > 26 years' expertise in industrial R&D 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 Company



Products CE certified

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## Aftercare

Installation  
Commissioning  
Training  
Service and maintenance  
Support: [armfieldassist.com](http://armfieldassist.com)