W SERIES

DEEP BED FILTER COLUMN – W5MkII

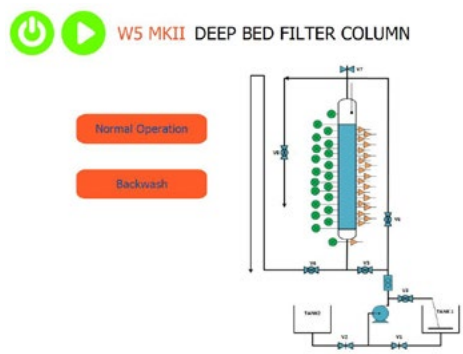
The Armfield Deep Bed Filter Column has been designed to operate identically to full-scale granular filters.

Using the same bed depth and filter media, tests on this unit provide operational data, which may be scaled up to full size.

Pilot trials of possible filter designs for water and sewage works can be made reliably at low cost.

ELECTRONIC PRESSURE SENSORS
DATA LOGGING VIA PC
ULTRASONIC FLOWMETER

Software screen shot



Slotted sample port

Control panel

Pressure sensors and sample ports in the column

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Issue: 2
URL: http://www.armfield.co.uk/w5
Applications
ChE CE IP

Description

The Armfield Deep Bed Filter Column is a clear acrylic unit with a flanged end to allow easy access.

The medium is supported on a corrosion-resistant gauze mesh below, packed with 1kg of 10mm Ballotini to ensure good wash water distribution. Slotted sampling tubes inserted through the wall penetrate into the media, and are fitted with control valves so that suspension samples can be taken isokinetically.

Pressure sensors are mounted on the column 40mm apart, inclined at 60° allowing pressure drop across the column to be recorded.

These sampling and pressure sensor probes are located at 40mm depth intervals, but staggered in position, over 0.8m depth.

Consequently, complete profiles of concentration changes in the suspension and of pressure variation can be measured during filter operation. The column can be operated as a pressure filter up to 1 bar.

The service system supplied comprises a pump, sump tanks, flow sensors, control valves, sparging device, sampling ports and 21 pressure sensors.

Requirements

Scale

- **Electrical supply:**

W5MKII-A	220-240V / 1ph / 50Hz
W5MKII-B	120V / 1ph / 60Hz
W5MKII-G	220-240V / 1ph / 60Hz

- Software requires a computer running Windows XP or above with a USB port. (Computer not supplied by Armfield)
- Approximately 10 kg of test medium to pack the column
- Test medium includes well-rounded quartz-grain sand BS 16-30 mesh (1.0 – 0.5mm), anthracite, crushed flint or aluminium oxide (not supplied)
- Kaolin clay (not supplied)

Technical details

Filter column (clear acrylic)	100mm ID x 1350 mm long
Typical media depth	700mm
Gauze mesh size	0.35mm
Sump tank size	2 x 350L
Ultrasonic flow meter	25 L/min
Universal singe wire interface	armBUS
Pressure sensors	21 x 1 bar pressure sensors
Single phase centrifugal pump	0.55KW

Overall dimensions

Length	3.00m
Width	0.75m
Height	2.275m
Packed and crated shipping specifications	
Volume	3.5m^3
Gross weight	400Kg

Features / benefits

- Metal framework with transparent test section for observation
- Data logging via PC
- Self-contained
- Electronic pressure sensors
- Ultrasonic flowmeter
- Operational manual with teaching exercises

Software

The ArmBUS software enables the operator to select the appropriate stage of the process and a mimic diagram with measured variables is displayed. The speed of the pump can be varied to meet the required flow rate.

Results are saved in a log, which can be viewed and manipulated with the ArmBUS results viewer. Results can be printed or exported in a spreadsheet format, which can be opened in a wide range of packages for further analysis.

Learning objectives

- Effect of filtration on total head loss
- Measuring pressure drop profiles through the filter bed
- Measuring suspension concentration profiles through the filter bed
- Demonstration of reversed-flow fluidisation and backwashing
- The column may be readily adapted for absorption and ion-exchange studies

Optional Accessories

- Turbidity meter (ordering code: INST060)

Ordering specification

- A clear Perspex column (0.1m internal diameter x 1.35m long) mounted in a floor-standing framework approximately 2.0m high
- 2 x 350L tank capacity
- Ultrasonic flow meter 0-25 L/min
- Control valves, tubing
- 20 sample collectors
- 20 sample ports
- 21 electronic pressure sensors
- Operating pressures up to 1 bar
- 1-meter ruler
- Centrifugal open impeller pump 110l/min with bronze housing 230V single phase 50Hz motor with IP54 motor, 0.55kW and 0.75hp
- The filtration medium is supported by a corrosion-resistant gauze mesh below which is packed 1kg of 10mm Ballotini
- Sampling and pressure sensor tappings located at 40mm depth intervals staggered in position over 0.8m column height
- Control valves fitted to the sampling tubes enable isokinetic sampling
- Desktop software for control and data logging
- Results viewer software for analysing results
- Operational manual with teaching exercises

Ordering codes / electrical requirements

- W5MKII-A
- W5MKII-B
- W5MKII-G

Armfield standard warranty applies with this product