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ISO 9001:2008  
2YR EXTENDED WARRANTY

## FEATURES

- Four membrane module options:
  - Ceramic
  - Spiral wound
  - Hollow fibre
  - Tubular
- Capable of microfiltration, ultrafiltration, nanofiltration and reverse osmosis operations
- Maximum filtration pressure of 50 bar
- Clean-in-place capability
- Backpulsing option (suitable for certain modules)
- Variable retentate flow rate in order to change filtration cross-flow velocity
- Retentate electronic flowmeter measurement
- Retentate and permeate back pressure valves
- Pressure sensors on the retentate inlet and outlet of the filtration module and on the permeate line
- Mass balance option for permeate flow rate measurement
- All parameters are data logged

FT18-MkII shown above with FT18-5 Ceramic Filter Module and FT18-50 Backpulsing/Backflushing options fitted.

## BENEFITS

- Ability to assess the important cross-flow filtration module types on a single system
- Fully instrumented to allow the effect of process variables on filtration performance to be measured and logged
- Assessment of the effect of backpulsing on extending the time between CIP steps
- 5-10-litre processing volume enables development with minimal product
- Simple cleaning and maintenance protocols

PROVISIONAL



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The Armfield FT18-MkII is a small pilot-scale cross-flow filtration system designed to operate with a range of membrane module configurations. It can operate with as little as 5-10 litres of material but still give data that is useful for process scale-up. It can be used over the full range of cross-flow filtration applications from microfiltration through to reverse osmosis. It is the perfect tool to use, following on from flat sheet membrane trials with the FT17, for further process development and scale-up.

### Description

The system uses a high-pressure piston-recirculation pump to circulate product through the filter module of choice.

The triple-piston design combined with high-pressure flexibles minimises pressure pulsation. The operator can use their own feed vessel or this can be specified (FT18-20 option). The speed of the recirculation pump can be adjusted to suit the particular filtration module and the product.

The retentate back-pressure valve enables pressures up to 50 bar to be achieved. Accidental system over-pressure is avoided by a bursting disc downstream of the recirculation pump.

There is a permeate back-pressure valve so that accurate transmembrane pressures (TMP) can be set. Pressure sensors are sited on the retentate side on the inlet and outlet of the filter module, as well as on the permeate side. Any temperature gain in the retentate through recirculation at high pressure is removed using a 316 stainless steel shell and tube heat exchanger, which has corrugated tubes for improved heat transfer.



#### Ceramic Filter Module (FT18-5)

Filter housing:	316 stainless steel
Filter length:	1.0m
No of channels:	1
Channel internal diameter:	7mm
Membrane area:	0.022m <sup>2</sup>
Available membranes:	MF: 110-800nm UF: 3-10nm (2-20 kDa) NF: 200-600 Da



#### Spiral Wound Filter Module (FT18-6)

Filter housing:	1812 (1.8" x 12") 316 stainless steel sanitary housing
Generic module for use with female elements from different membrane manufacturers	
Membrane area depends on element (max: 0.45m <sup>2</sup> )	
The module can be used for MF, UF, NF and RO operations	
Max operating pressure:	40 bar



#### Hollow Fibre Filter Module (FT18-7)

Membrane housing:	Polysulfone
Filter length:	0.46m
Fibre internal diameter:	1.1mm
Max operating pressure:	2.1-2.8 bar
Membrane area:	0.09m <sup>2</sup>
Available membranes:	5-500 kDa

### **Tubular Filter Module (FT18-8)**

**Filter housing:** 316 stainless steel  
**Filter length:** 2 x 0.3m  
**Membrane area:** 0.024m<sup>2</sup>  
**Max operating pressure:** 40 bar (recommended)  
**Available membranes:** UF: 2-200 kDa  
NF: 60-75% CaCl<sub>2</sub> rejection  
RO: 80-99 % NaCl rejection



### **Vessel (FT18-20)**

30-litre 316 stainless steel retentate vessel for recirculated product, complete with sensor to protect against dry running. Mass balance option for permeate flow rate measurement.



### **Backpulsing/Backflushing (FT18-50)<sup>1</sup>**

- This module enables filtration pressure to be reversed for a period of time during processing in order to reduce fouling and thus enable extended operation between cleaning cycles
- This module is compatible with the Ceramic (FT18-5) and Hollow Fibre (FT18-7) filter modules only\*
- Must be ordered with FT18-MkII base unit

### **Electronic Flow Meter (FT18-44)<sup>1</sup>**

- Electronic flow meter that measures the recirculation (retentate) flow rate
- Must be ordered with FT18-MkII base unit

### **System Control**

- As standard the system is controlled by a PC (not supplied) with a USB interface
- An optional touchscreen system (FT18-60) can be used in place of a PC (not supplied)

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## Develop with us

Armfield R&D products include:

- Hygienic connections as standard ✓
- 316 Stainless steel ✓
- CE certification ✓
- Extended warranty as standard ✓



**armfield**  
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## Applications

- **Dairy:** Removal of microorganisms from milk and cheese brines, milk protein standardisation and concentration, whey demineralisation, whey protein fractionation, defatting of whey proteins, and filtration
- **Fermented foods:** Clarification of wine, beer and vinegar, removal of alcohol from wine and beer, post-fermentation yeast recovery, wine lifting
- **Fruit juices:** Clarification and concentration
- **Water:** Water and wastewater purification, desalination, water softening
- **Pharma:** Concentration and purification of macromolecules, sterile filtration, viral clearance, cell separation, water purification
- **Edible oils:** Degumming of vegetable oils

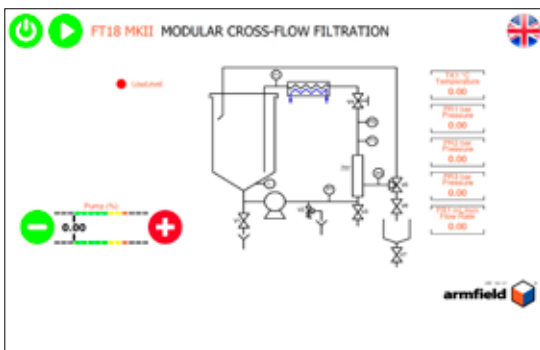
## Associated equipment

**FT140 – Mixing Vessels**

**FT63/64 – Laboratory Process Chiller**

## Software

The armSOFT software displays the equipment flow diagram with readings displayed for all sensors. Cross-flow velocity, transmembrane pressure and flux are also displayed. There are also controls for feed pump stop/start and speed. A data tab offers several options for processing and displaying the data from the equipment in the form of graphs and results tables. Results are saved in a log that can be viewed and manipulated with the armSOFT Results Viewer or they can be exported in a generic spreadsheet format for further analysis.



## Specifications

Max flow rate:	1670 l/hr
Max operating pressure:	50 bar
Pressure sensors:	0-50 bar
Mass balance range:	0-6kg

## Requirements

### Electrical supply:

FT18-MKII-C:	380-415V / 3ph / 50Hz / 10A
FT18-MKII-D:	208-220V / 3ph / 60Hz / 20A

### Water supply:

Towns water 10 l/min at 2 bar or equivalent flow recirculation chiller for lower temperatures

### Air supply:

6 bar with minimal air consumption (Required for FT18-50 option only)

## Ordering codes

FT18-MKII-C:	380-415V / 3ph / 50Hz / 10A
FT18-MKII-D:	208-220V / 3ph / 60Hz / 20A

Note: The FT18-MKII is supplied without modules or options. Please select one or more modules at time of placing your order.

## Option ordering codes

- FT18-5 Ceramic Filter Module (option)
- FT18-6 Spiral Wound Filter Module (option)
- FT18-7 Hollow Fibre Filter Module (option)
- FT18-8 Tubular Filter Module (option)
- FT18-20 Vessel (option)
- FT18-44<sup>1</sup> Electronic Flow Meter (option)
- FT18-50\*<sup>1</sup> Backpulsing/Backflushing (option)
- FT18-60 Touchscreen system (option)

## Overall dimensions

Length:	0.72m
Height:	1.50m
Width:	1.00m

## Shipping specification

Volume:	1.30m <sup>3</sup>
Gross weight:	300kg

**Please note:** \*FT18-50 compatible with FT18-5 and FT18-7 filter modules only.

<sup>1</sup> The FT18-44 and FT18-50 options must be defined at time of order as these cannot be retro-fitted by the end user.

The Armfield range includes HTST/UHT/aseptic systems, carbonator/filler/cappers, spray dryers/chillers, multifunction batch processors, ice cream freezers, margarine crystallisers, extractors, edible oils processors and more. For further information about our products and services, or to book a trial at one of our trials facilities, please contact us.