bionet® ENGINEERING

Bioprocess Lab and Pilot Equipment

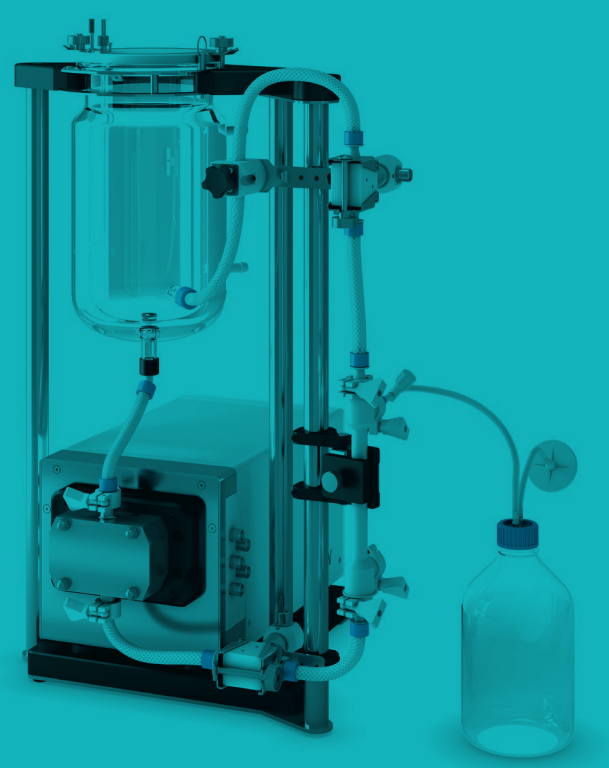
F0

F1

F2

F3

M1



M2

MARTA & ROSITA

M1

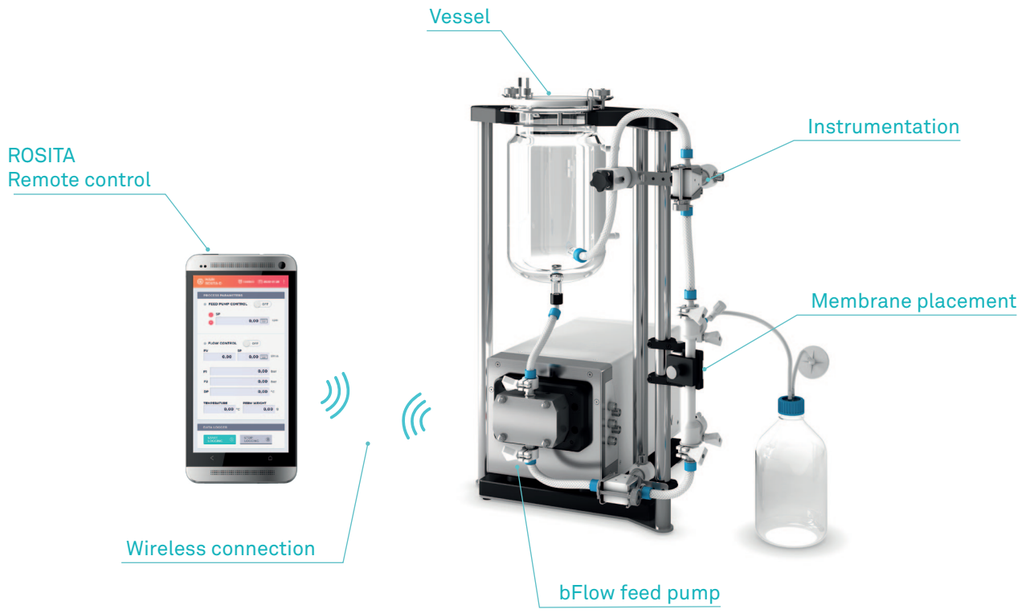
Bioprocess Lab and Pilot Equipment

JUMP!

IT'S TIME TO DEVELOP YOUR DOWNSTREAM AND CHOOSE A SUITABLE LABSCALE TFF SYSTEM!

Don't hesitate in jumping ahead and testing Tangential (Cross) Flow Filtration (TFF) for your bioprocess downstream

The M1 unit is a unique solution for all those seeking a compact system for **concentration and/or clarification** of the **biomass and/or biomolecules** from their microbial fermentation, or cell culture, processes, at lab scale.



M1 is the right tool for

Study of separation processes using tangential (cross) flow filtration membranes.

- Technology selection (membrane technology and materials)
- Achievable concentration factor and filterability curves.
- Cleaning procedures.
- Optimum membrane pore size.
- Impact of the operative parameters (cross-flow velocity, pressure and temperature) regarding yields, flows and product quality.
- Small productions.

WHY IS M1 A UNIQUE LABSCALE SYSTEM FOR TECHNOLOGY SCREENING, OPTIMIZATION AND SCALE-UP ACTIVITIES?

There are a number of product characteristics and technology configurations that have an impact in the potential of TFF to your process and its scalability to larger scales.

The M1 offers the flexibility **(in the form of modularity and membrane selection)** required for creating the right configuration for your filtration system.

Moreover, it provides you with the right technological components (e.g. recirculation pump) for your **process scalability**. Meaning you can be confident that your results can be transferred to a production scale.

Finally, the combination of an IOT-based architecture and our ROSITA software solutions renders your **process consistent and reproducible, and provides the data for a complete test analysis.**

Membrane selection

The M1 allows you to select the most optimum membrane technology and use a complete range of pore sizes, surface and channel size, so you can choose the right solution; without the limitations of membrane vendor systems.

Three types of membranes, **Cassettes, Ceramic and Hollow Fibre**, from main leading vendors, can be interchangeably integrated and tested in the M1. This allows for un-parallel capabilities for comparing membranes using identical process conditions and data registration for analysis.

These membranes are available in a number of configurations:

- 21 different pore sizes in the microfiltration, ultrafiltration and spaces (from 1.4 µm in the microfiltration space to less than 1kDa in the ultrafiltration space).
- Different size and number of channels (in ceramic) and thereby membrane surface area available.

bFlow: A SMART FEEDING PUMP

The bFlow is the smart pump used as a feeding pump in the M1. Is the core of our M1 series and is part of our **Bionet bSmart** family of lab process modules. It is an exceptional pump with capabilities beyond standard lab pumps.

What makes it so exceptional?

- **A unique range of flows and pressure.** From 800 to 10,000 ml per minute and from 0 to 6 barg working pressure. All driven by a servomotor for precise control of rpms.
- **The right pump technology.** The multilobe pump technology guarantees your lab results are truly valid for scale-up and provides extraordinary gentleness for sensible biomass and biomolecules.
- **Connected and smart.** The bFlow comes with ready connections to multiple sensors and data logging for batch data recording for a later analysis. Beyond that you can automate some process parameters.
- **Double interface.** You can control the pump through a physical control panel with buttons and display or through a web interface through a wireless connection with ROSITA SW.

PROCESS CONTROL

The M1 is a manual unit with some automatic controls and full data registration of system and process parameters. Some of them are data from actuators or instruments and other are the result of calculations which can be made based on the registered data.

- **Cross flow rate.** Or recirculation rate or retentate flow can be monitored and controlled with the addition of a Flowmeter (Optional) with a control loop with the pump driver.
- **Filterability.** Permeate flux (in l/h) can be monitored with a connected scale (Optional).
- **Product temperature.** With a TT on the vessel
- **Pressure.** Pressure is measured in 2 points as standard (feed and permeate) and one optional (permeate) allowing for calculation of Transmembrane Pressure and other critical process parameters.

● standard o optional

	M1
APPLICATION DETAILS	
Applications	Microfiltration, Ultrafiltration
Batch volume	Up to 20L (assuming a good filtrability)
DESIGN DETAILS	
Operation footprint (H x W x D)	540 x 650 x 600 mm
Vessel working volume	3 L (other volumes available)
Vessel type	Single wall (jacketed vessel available)
Vessel material	Borosilicate Glass
Dead volume (ml)	200
MEMBRANES	
Membrane vendor	Neutral
Membrane type	Reusable and single-use
Membrane types	Ceramic, Hollow Fiber and Cassettes
Pore Size (for MF)	
Ceramic (µm)	0.05, 0.1, 0.14, 0.2, 0.4, 0.45, 0.5, 0.8, 1.2, 1.4
Hollow Fiber (µm)	0.1, 0.2, 0.45, 0.65
Cassette (µm)	0.1, 0.2, 0.45, 0.65
Pore Size (for UF)	
Ceramic	1, 5, 10, 20, 50, 100, 150, 300 kD 20, 50 nm
Hollow Fiber	1, 3, 5, 10, 30, 50, 70, 100, 300, 500, 750 kD
Cassette	1, 3, 5, 8, 10, 30, 50, 70, 100, 200, 300, 500, 1000 kD
Surface área	
Ceramic	up to 0,01 m2
Hollow Fiber	up to 0,079 m2
Cassette	up to 0,5 m2
bFlow (recirculation pump)	
Material	SS 316L Rotor and casing, EPDM Elastomers
Surface finishes	Inner surfaces finished to Ra 0.6µm
Motor	Servo-motor drive for maximized flow range with Integrated servo controller
Operation details	Fully drainable CIP compatible design
Flow range	0.8-10 L/min
Pressure range	0 – 6 barg

PROCESS CONTROL	Manual/ Non-feedback Automated	Feedback Automated (a.k.a control loop)	Data log	Description
bFlow speed (rpm)	●	o	●	Basic: configurable pump "rpm" and pump data log Optional: feedback-automatic control and flow data log)if recirculation flow meter is installed)
Recirculation flow	●	o	o	
TMP (Transmembrane Pressure)	●	–	o	Basic: manual control of retentate manual valve Optional: calculation and data log (if permeate pressure is installed)
Permeate pressure	o	–	o	Optional: indirect manual control (if manual valve is installed); data log (if permeate sensor is installed)
Feed Pressure	–	–	●	Basic: indirect control; data log (since sensor is installed)
Retentate Pressure	●	–	●	Basic: manual control (since retentate manual valve is included); and data log (since sensor is installed)
Permeate Flow	o	–	o	Optional: manual control (if manual valve is installed); data log (if scale is installed)
Product temperature	–	–	●	Basic: data log (since TT is included)

Bionet Engineering

Parque tecnológico Fuente Álamo, 30320
Fuente Álamo (Murcia) Spain
Ph. +34 968 197 536 · Fax +34 968 197 543
sales@bionet.com

www.bionet.com

bionet®