

# Bioprocess Lab and Pilot Equipment

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F0

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F1



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F2

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F3

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M1

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M2

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MARTA & ROSITA

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# F1

## Bioprocess Lab and Pilot Equipment

### VALUE PROPOSITION

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The F1 series include autoclavable bench scale bioreactors/fermenters designed to meet the challenging and widely diverse R&D requirements and small-scale biomolecules production by using microbial and animal cells for biopharmaceutical-, food-, agricultural- and other biotechnological applications.

Though a serially produced and standardized model, to combine the highest technological solutions for the common market demands, it is well thought for its expansion and customization towards a range of special requirements.



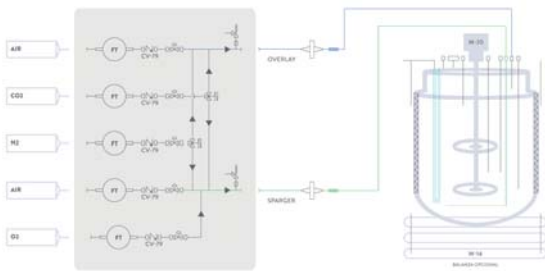
## KEY BENEFITS

### A CONFIGURABLE DESIGN

A modular design, that allows for the expansion of hardware and software capabilities in the form of advanced modules that follow the plug and play concept.

### ADVANCED GAS MODULE

- An Advanced Gas Module, for the automatic mixing of up to 4 gases and their inlet via both sparger and overlay. The plugging of this module will enable software capabilities such as the acidification of the broth (i.e. pH control) via acid or CO<sub>2</sub>, and the use of N<sub>2</sub> as an actuator in the DO cascade.



### CONTINUOUS PROCESS MODULE

- The continuous process module, for the extraction and renewal of media, and the perfusion module for extraction, renewal and separation of biomass from smaller molecular components.



### ENHANCING KNOWLEDGE

The availability of spare electronics and software flexibility for the integration of a variety of additional instrumentation and the integration of their measurements into advanced control strategies.

- Example of instruments which can be added beyond the standard configuration are: Optical Density, Viable Cells, Dissolved CO<sub>2</sub>, Exhaust gas composition, Redox, Weight and many others.

- Most of these instruments have a corresponding ROSITA SW module. These specific SW modules allows the user to select parameter as part of your control strategies and gives additional calculated information (e.g. OTR or OUR) in real time.

## GMP COMPLIANT

The F1 is BIONET option for those who look for a bench scale unit which can be designed, built and qualified under GMP guidelines to allow the validation of your processes.

- Our GMP approach is structured so it can be adapted to your specific project and regulatory needs. The upgrade from a standard unit to a GMP one will affect many issues on the design and construction: Technologies, Calibrations, Documentation, Qualification and SW (including ER under CFR 21 c 11).

# GMP CERTIFIED

## AUTOMATION

Its inseparable friend is ROSITA, Bionet's proprietary automation software for laboratory use, which allows for a sophisticated and tight automatic control over the processes and provides the user with ways to visualize, analyse and manage the data.

- F1 can be also supplied with MARTA SW in GMP environments.



	F1 MB	F1 CC	F1 MB	F1 CC
<b>GENERAL</b>			<b>TEMPERATURE CONTROL</b>	
Material	Vessel: Borosilicate glass	Vessel: Borosilicate glass	Cooling	Circuit from an external chilled water source (not included) to jacket
Total footprint on bench (W x H x D)	895-995 x 840 x 500 (SINGLE) 1120-1330 x 840 x 610 (TWIN)	895-995 x 840 x 500 (SINGLE) 1120-1330 x 840 x 610 (TWIN)	Heating	Heating blanket
Autoclave dimensions (W x H x D)	220 x 459 (527 with condenser) x 212 (1L & 3L) 276 x 595 (663 with condenser) x 257 (5L & 8L) 286 x 650 x (718 with condenser) x 277 (10L)	220 x 459 (527 with condenser) x 212 (2L) 276 x 595 (663 with condenser) x 257 (5L & 8L) 286 x 650 x (718 with condenser) x 277 (10L)	<b>INSTRUMENTATION</b>	
Multibioreactor configuration	○	○	Basic instrumentation package	pH, DO, temperature, level
<b>VESSEL</b>			<b>EXPANSION POSSIBILITIES</b>	
Working volumes available (L)	1, 3, 5, 8, 10.	2, 5	Advanced Gas Module	○ ●
Minimum working volume (L)	0.7 (1L); 1.4 (3L); 3.0 (5L); 3.9 (8L); 5.5 (10L).	1.6 (2L); 3.6 (5L)	Variable Speed Pump	○ ○
Wall	Jacketed	Jacketed	Continuous Process Module	○ ○
<b>AGITATION</b>			Perfusion module	○ ○
Agitator	Top mounted Single mechanical seal *Optional: double mechanical seal	Top mounted agitator Single mechanical seal *Optional: double mechanical seal	Scales	○ ○
Impellers	Standard: 2x or 3x Rushton Optional: Marine/Pitched blade; or customised	Standard: 1x Marine Optional: customised (upon demand)	Additional sensors	○ ○
Speed (rpm)	0-2000	0-500	Customized modules	○ (e.g. illumination systems)
Motorpower	0.37 kW	0.37 kW	<b>AVAILABLE EXTRA ACCESSORIES</b>	
<b>GASSING MODULE</b>			GMP	○ ○
Gas lines	Standard: Air and O2 Optional: conversion/addition of gas lines	Standard: Advanced Gas Module (Air, O2, N2 and CO2)	Condenser, Additions kit, Sampling kit, Range of dip tubes, Range of turbines, Additional port plugs	
Gas inlet to vessel	Standard: Sparger	Sparger and Overlay	<b>SOFTWARE</b>	
Gas flow control and gas mixture	Optional: Overlay	Automatic via MFCs	Installed SW	ROSITA
Gas flows	Automatic via MFCs		HMI	Integrated touch PC (included), connected via Ethernet
If Air	0.2-18 slpm	0-750 sscm	Remote access	Additional Ethernet port, for local remote access from any user within the LAN and external remote access from outside the client's site via a safe VPN tunnel
If O2	0.1-9 slpm	0-750 sscm	Additional Ethernet port, for local remote access from any user within the LAN and external remote access from outside the client's site via a safe VPN tunnel	
If N2	0.1-9 slpm	0-750 sscm	<b>UTILITY REQUIREMENTS</b>	
If CO2	0.1-9 slpm	0-750 sscm	Chilled water	Cooling power: 140-400 W (depending on volume and SINGLE vs. TWIN) Minimum pump pressure: 0.8-1 barg Minimum pump flow: 6 L/min (SINGLE) 12 L/min (TWIN)
0.22 µm filter in gas lines	●	●	Compressed air	1-2 vvm at 1.5 barg
Condenser	○	○	Steam	-
Filter at exhaust gas	●	●	Electricity	1.1 kW (SINGLE) 2.2 kW (TWIN)
<b>DOSAGE MODULE</b>			1.1 kW (SINGLE) 2.2 kW (TWIN)	
Pumps	Standard: 3x fixed speed Optional: Variable Speed Pump or Continuous Processing Module (up to 3 pumps)	Standard: 3x fixed speed Optional: Variable Speed Pump or Continuous Processing Module (up to 3 pumps)		

## Bionet Engineering

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