bionet®
ENGINEERING

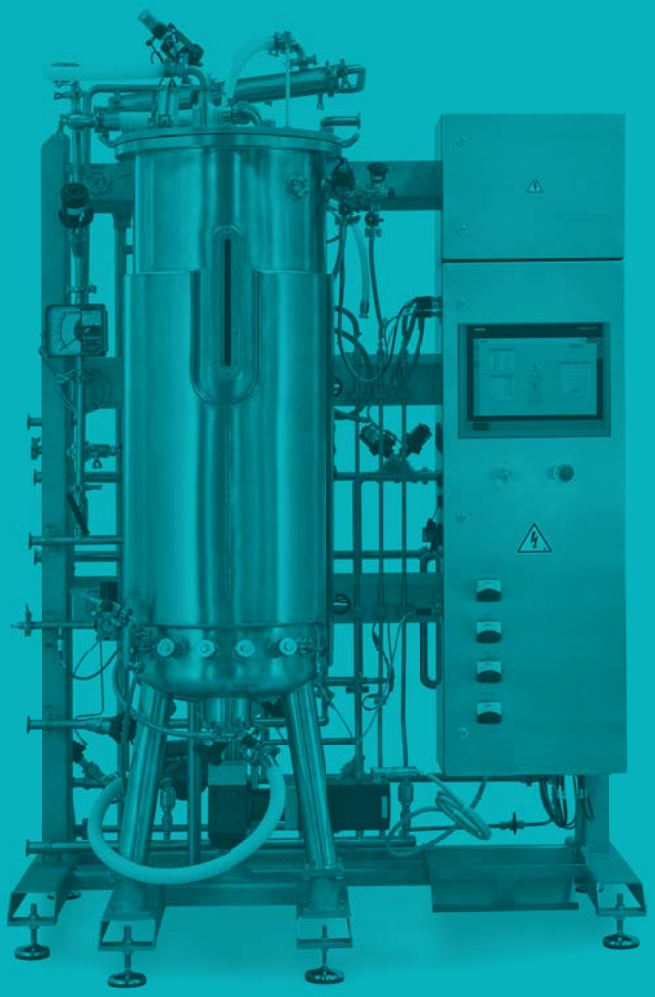
Bioprocess Lab and Pilot Equipment

F0

F1

F2

F3



M1

M2

MARTA & ROSITA

F3

Bioprocess Lab and Pilot Equipment

VALUE PROPOSITION

Bionet F3 models is a unique concept for those seeking for premium quality a Steam In Place (SIP) Bioreactor of industrial scale and conception, with the quality of a standardized product but with the flexibility to develop and scale-up new bioprocesses.

A system with a state-of-the-art technology core technology and many details, has been created to be the market reference in pilot or small industrial fermentation and cell culture. It comes in 3 models with 50, 100 and 200 l maximum working volume.

KEY BENEFITS

AGITATION

Bottom agitation system, with a servo gives a complete (from almost zero to hundreds of rpms) broad speed range and power input, adapted to the needs of your culture.

• Being bottom placed allows for clean and light top lid, giving you easier maintenance and numerous ports.

• Available with standard impellers (Rushton, marine, pitch blade) or special designs on demand.

• Mechanical seal can be single, double (SIP) or magnetic coupling.

GASSING

The F3 has the needed add-ons for giving you the technology for the most demanding gas control. With our Advanced Gas Module for Cell Culture (with Air, N2, O2 and CO2, and inlets in sparger and doom) you will be able to the control the parameters you need for optimizing and qualify your protein production.

TEMPERATURE CONTROL

• The temperature control system includes a jacket which covers practically the whole vessel, combined with a primary circuit with heater, heat exchanger for cooling water and recirculation pump.

• All this provides accurate temperature control and big heat exchange capabilities; even for the most demanding cultures.

INTEGRATED CIP

• As its smaller sister the F2 the F3 can integrate a CIP system. All in the same frame, with no extra-footprint, using the dossing pumps for acid and base and the pH probe, the CIP can be made without external intervention.

• All controlled from our control SW MARTA in which the CIP Module allows for programming of recipes. which can be created and saved to allow for standardization of cleaning and productivity.

GMP COMPLIANT - DESIGNED, BUILT & QUALIFIED

As all BIONET bioreactors and filtration units, the F3 can be built and qualified under GMP guidelines to allow the validation of your processes in a regulated environment.

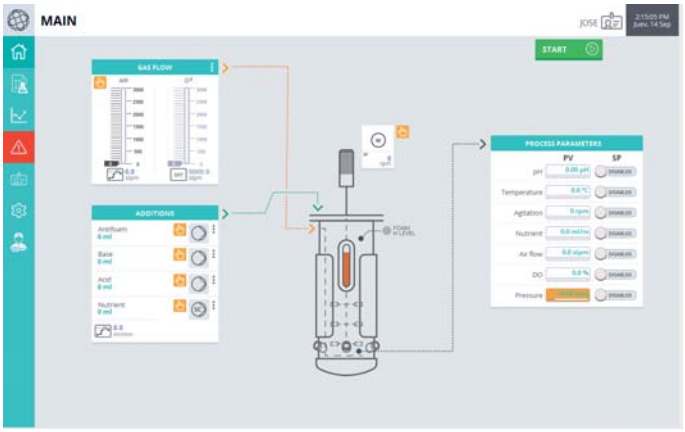
• Our GMP approach is structured so it can be adapted to your specific project and regulatory needs. The upgrade from a standard unit to a GMP one will affect many issues on the design and construction: Technologies, Calibrations, Documentation, Qualification and SW (including ERs under CFR 21 c 11).

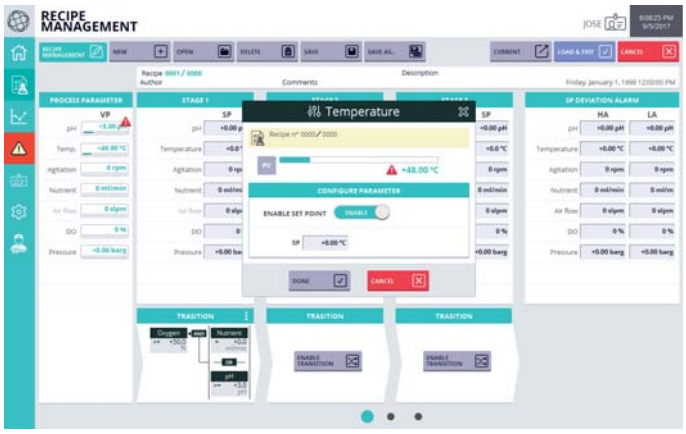
• At the F3 series we have structured these GMP features in preconfigured technology and service packages, so they can be easy implemented and adapted to your specific demands, saving time and money.

DQ, IQ, OQ.

AUTOMATION

MARTA is the Automation SW which comes installed in the F3 units. This model has off-the-shelve solutions for Cell Culture, Fermentation which can be expanded with additional modules for local SIP and CIP, new instrumentation or advanced gassing or dosing control.





● standard o optional

	F3 MB	F3 CC
GENERAL		
Material	316L SS in surfaces in contact with product. 304 SS in frame and electrical cabinet. Borosilicate in sight glass. All gaskets FDA compliant.	
Skid footprint (W x H x D)	1490 x 2000 x 710 (50 L & 100 L) 1700 x 2080 x 1190 (200 L)	1490 x 2000 x 710 (20L & 50L & 100L) 1700 x 2080 x 1190 (200L)
VESSEL & PORTS		
Working volumes available (L)	50, 100, 200	20, 50, 100, 200
Vessel total volume (L)	75, 143, 250	22, 75, 143, 250
Vessel design	Flat top and klöpper bottom.	Flat top and klöpper bottom.
Minimum working volume (L)	10 (50L) 20 (100L) 33 (200L)	6 (20L) 10 (50L) 20 (100L) 33 (200L)
Total H:D	3:1	3:1
Working H:D	1.8:1, 2.3:1, 2.3:1	2.1:1, 1.8:1, 2.3:1, 2.3:1
AGITATION		
Agitator	Bottom mounted Standard: Single mechanical seal *Optional: Double mechanical seal and magnetic.	Top mounted Standard: Single mechanical seal *Optional: Double mechanical seal and magnetic.
Impellers	Standard: 3x Rushton Optional: Marine/ Pitched blade; or customised.	Standard: 1x Marine Optional: customised (upon demand).
Speed (rpm)	0-1000 (50L) 0-800 (100L) 0-600 (200L)	0-280 (20L) 0-250 (50L) 0-200 (100L) 0-150 (200L)
Motorpower	1.5 kW (50L) 2.2 kW (100L) 3 kW (200L)	1.1 kW (20L) 1.5 kW (50L) 2.2 kW (100L) 3 kW (200L)
GASSING MODULE		
Gas lines	Standard: Air Optional: conversion of existing gas or addition of extra gas lines.	Standard: Advanced gassing control unit with Air, O_2, N_2 and CO_2.
Gas inlet to vessel	Standard: Sparger Optional: Overlay	Standard: Sparger and Overlay
Gas flow control and gas mixture	Standard: manual via rotameters. Optional: automatic MFCs.	Standard: manual via rotameters. Optional: automatic MFCs.
Gas flows	**Air**: 1.9-9 Nm3/h (50L) 3.9-18 Nm3/h (100L) 7.8-36 Nm3/h (200L) **O_2**: 0.4-3 Nm3/h (50L) 0.8-6 Nm3/h (100L) 1.6-12 Nm3/h (200L) All flows can be modified on demand.	**Air**: 0.3-4 slpm (20L) 0.7-10 slpm (50L) 1.3-20 slpm (100L) 2.6-40 slpm (200L) **O_2**: 0.05-1.2 slpm (20L) 0.1-3 slpm (50L) 0.3-6 slpm (100L) 0.5-12 slpm (200L)
0.22 µm filter in gas inlet	●	●
Condenser for exhaust gas	●	●
0.22 µm filter at exhaust gas	o	o

	F3 MB	F3 CC
DOSAGE MODULE		
Pumps	SStandard: 3x fixed speed for Acid, base and Antifoam. Optional: Fed-batch Variable Speed Pump module or Continuous Processing Module (up to 3 pumps).	Standard: 3x fixed speed for Acid, base and Antifoam. Optional: Fed-batch Variable Speed Pump module or Continuous Processing Module (up to 3 pumps).
TEMPERATURE CONTROL		
Cooling	Secondary circuit from an external chilled water source to heat exchanger in main circuit.	Secondary circuit from an external chilled water source to heat exchanger in main circuit.
Heating	Electrical resistance in water circuit.	Electrical resistance in water circuit.
INSTRUMENTATION		
Basic instrumentation package	pH, DO, temperature, level.	pH, DO, temperature, level.
Instrumentation available as add-on	Optical Density, Redox potential, Exhaust gas composition, Conductivity, Volume and Weight.	Dissolved CO_2, Exhaust gas composition, Conductivity, Viable cells, Volume and Weight.
EXPANSION POSSIBILITIES		
Advanced Gas Module (Air, O_2, CO_2, N_2) in sparger and overlay	o	●
Variable speed pump for dossing	o	o
Continuous process module	o	o
Perfusion module	o	o
Scales (for precision in additions, sampling, harvesting, continuous processing and perfusion)	o	o
CIP (Integrated) module	o	o
Additional sensors (and associated control loops)	o (e.g. for automatic pressure control)	o (e.g. for automatic pressure control)
Other customized modules	o	o
AVAILABLE MECHANICAL ACCESSORIES	Sterile Addition Ports (SAP); Crane; Spray ball; Exhaust gas filter; Range of Dip Tubes; Several types of turbines; Additional Port Plugs	
GMP	o	o
AUTOMATION		
Installed SW	MARTA	MARTA
HMI	Integrated touch panel PC 15"	Integrated touch panel PC 15"
Remote access	Local remote access through a direct LAN connection or external remote access through a properly configured VPN connection.	Local remote access through a direct LAN connection or external remote access through a properly configured VPN connection.
UTILITY REQUIREMENTS		
Chilled water	Minimum pressure: 2.5-3 barg 8–12º C	Minimum pressure: 2.5-3 barg 8–12º C
Compressed air	6-7 barg	6-7 barg
Steam	50 kg/h @ 1.5-2.5 barg (Clean Steam) 50 kg/h @ 2.5-3 barg (Industrial Steam)	50 kg/h @ 1.5-2.5 barg (Clean Steam) 50 kg/h @ 2.5-3 barg (Industrial Steam)
Electricity	6 kW (50 L) 6.5 kW (100 L) 8.5 kW (200 L)	5.5. kW (20 L) 6 kW (50 L) 6.5 (100 L) 8.5 kW (200 L)

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