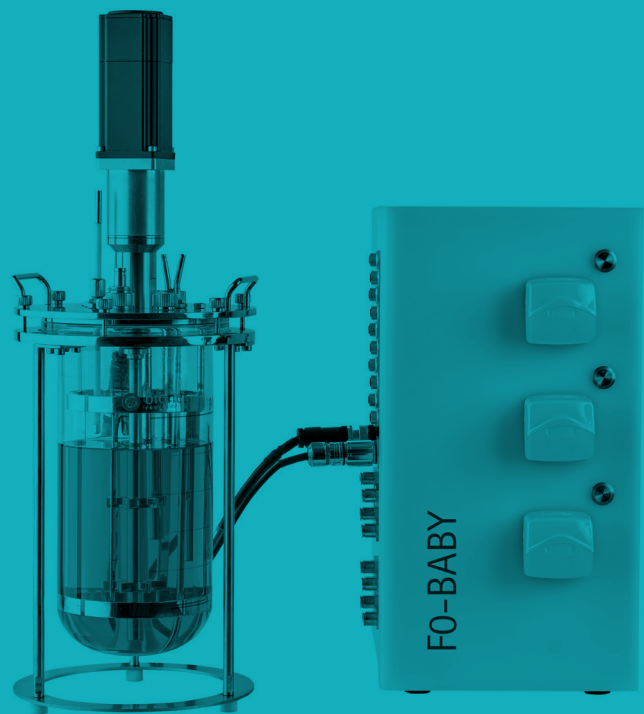


# Bioprocess Lab and Pilot Equipment

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F0



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F1

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F2

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F3

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M50

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AUX

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MARTA & ROSITA

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# FO

## Bioprocess Lab and Pilot Equipment

### VALUE PROPOSITION

The FO-BABY is the optimal entry level autoclavable solution for those in the need of a complete fermentation or cell culturing equipment that while offering simplicity at all levels, it includes advanced instrumentation and automation capabilities.

The system provides a cost-effective and user-friendly alternative to the bigger and more complex bioreactors and fermenters, being ideal for training and education purposes, R&D and small-scale protein production and cells growth.



## KEY BENEFITS

The basic configuration of F0 already meets each one of the most common requirements in the whole spectrum of applications and users, by being:

### HANDY

- It shows a tidy and neat design, which takes up minimal space in the lab bench.

### ADAPTABLE

- Vessels of different volumes (1, 3 and 5 L) are available and interchangeable.
- The agitation system is adaptable to the nature of the cells and the broth thanks to the wide speed range delivered by the servomotor and the choice range regarding the number and type of turbines (e.g. Rushton and Marine among others).



### EXPANDABLE

There are also several add-ons available, which offer the flexibility that the uncertainty present in R&D activities strictly asks for, including:

- A customisable and automatic gas module with up to 4 gas inlets and gas mixing combinations (air, O<sub>2</sub>, N<sub>2</sub>, CO<sub>2</sub>), which may become relevant in special microbiology and cell culturing applications. Adjustment in the gas flows can be made on the basis of percentages of the total gas flow or individually in *slpm*.
- The option to add a perfusion module, comprised of a ATF membrane, 3 external peristaltic pumps and two scales.
- The option to add a fourth (or further) external peristaltic pump, for uses such as nutrient addition in fed-batch or continuous mode configurations.

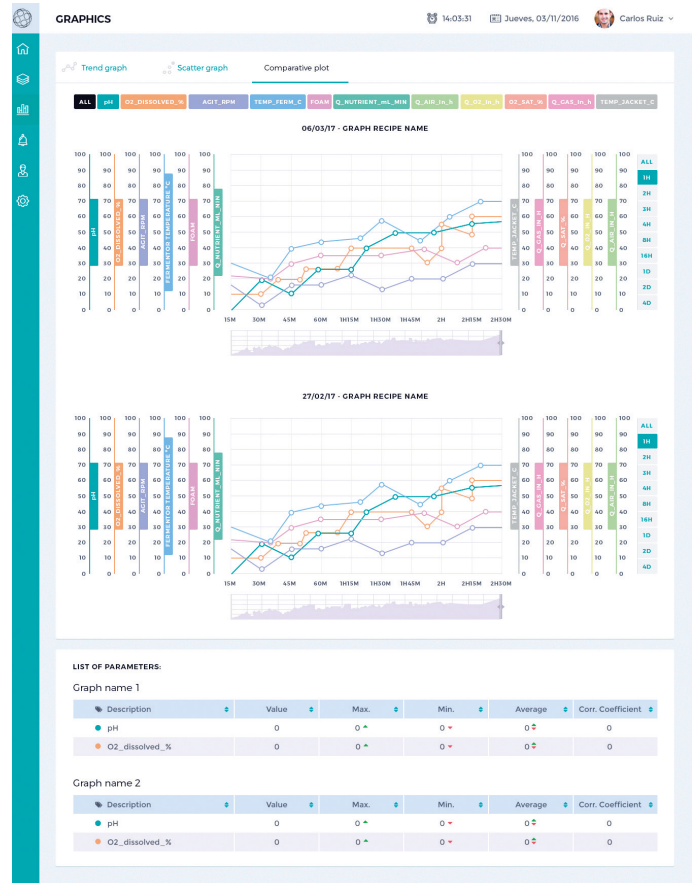


### COMPREHENSIVE

- A range of accessories are available to facilitate the F0 handling and usability. For instance, a sampling kit is available for aseptic extraction.
- The F0 design allows an easy and almost immediate installation of new actuators and controls devices such as additional probes, scales, etc.

## AUTOMATION

It is delivered with an external touch PC and a license of ROSITA, our new proprietary basic automation software that comprises a full SCADA for the automation, control and visualization of R&D, process optimization and small production bioprocess activities.



We have equipped ROSITA with the necessary features to be:

### ANALYTICAL

- We especially believe in the advantage that analytics have to offer in a lab environment, in activities such as the characterization of strains and the identification of key process parameters.

We have attributed great importance to the field of visual and analytical tools, offering solutions such as trend graphs, comparative graphs and calculations for the control and visualization of the ongoing and/or past bioprocesses.

### SMART

- The F0 comes with a range of sensors and actuators that, together with ROSITA, make various form of automation possible.
- Experiment automation can be done via set-point profiling, cascade-mode configuration and/or recipe programming (with time –and events– based transitions).

## FO DATA SHEET

	1 L	3 L	5 L
<b>DIMENSIONS (mm)</b>			
Ample footprint on bench (W x H x D)	600×660×380	600×660×380	600×660×380
Autoclave dimensions (H x W)	424×190	460×220	544×260
BCU (W x H x D)	240×450×380	240×450×380	240×450×380

	1 L	3 L	5 L
<b>UTILITIES</b>			
Compressed air supply	3 barg	3 barg	3 barg
Cooling water supply	0.2 – 0.5 barg 10°C 25 – 30 L/min	0.2 – 0.5 barg 10°C 25 – 30 L/min	0.2 – 0.5 barg 10°C 25 – 30 L/min
Power supply	230V 50 Hz 16 A	230V 50 Hz 16 A	230V 50 Hz 16 A

	1 L	3 L	5 L
<b>VESSEL</b>			
Wall	Single wall	Single wall	Single wall
Number of vessels	1	1	1
Total volume (L)	2.2	4.3	7.1
Working volume %	67	70	70
Max. working volume (L)	1.5	3	5
Minimum working volume (L)			
Microbiology	0.7	1.4	3
Cell culturing	0.9	1.6	
Total H:D			
Microbiology	2.6:1	2.3:1	2.3:1
Cell culturing	1.9:1	1.8	1.8:1
Working H:D			
Microbiology	1.7:1	1.6:1	1.6:1
Cell culturing	1.3:1	1.3:1	1.3:1

	1 L	3 L	5 L
<b>AGITATION</b>			
Agitator	Top mounted agitator, with single mechanical seal.		
Impellers	2 impellers (Rushton, Marine and other types).		
Speed (rpm)	0 – 2000	0 – 2000	0 – 2000
Motorpower	0.37 kW	0.37 kW	0.37 kW

	1 L	3 L	5 L
<b>GASSING MODULE</b>			
Air inlet (MFC)	●	●	●
Oxygen (MFC)	○	○	○
N <sub>2</sub> (MFC)	○	○	○
CO <sub>2</sub> (MFC)	○	○	○
Gas inlet via sparger	●	●	●
Gas inlet via dome	○	○	○
0.22 µm filter in gas line	●	●	●
Condenser for exhaust gas	○	○	○
Filter at exhaust gas	●	●	●

	1 L	3 L	5 L
<b>DOSAGE MODULE</b>			
3 peristaltic pumps for Acid, Base and Antifoam	●	●	●
Fixed speed range (mL/min)	0.7 – 25	0.7 – 25	0.7 – 25
Extra pump (for nutrients in fed-batch)	○	○	○
Variable speed (mL/min)	1.1 – 85	1.1 – 85	1.1 – 85
Local on/off pump control button	●	●	●
Perfusion module with addition and harvest weight control and 3 external peristaltic pumps	○	○	○

	1 L	3 L	5 L
<b>TEMPERATURE CONTROL MODULE</b>			
Cooling	Circuit from external chilled water source to cooling finger, with a 3 way valve that opens to allow chilled water renewal.		
Heating	Electrical heating blanket.		

	1 L	3 L	5 L
<b>INSTRUMENTATION</b>			
Sensors included	pH, dO <sub>2</sub> , foam, temperature.		
Optional sensors	Optical density, Redox, dissolved CO <sub>2</sub> , exhaust gas analyzes, etc.		
Limitations	Up to 2	Up to 2	Up to 2

	1 L	3 L	5 L
<b>AUTOMATION</b>			
<b>User interface</b>			
SW	ROSITA	ROSITA	ROSITA
Navigating screens	Main synoptic view, Recipes, Graphs, Alarms, Users.		
Installation	External touch PC provided, connected to the BCU via Ethernet.		
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.		

	1 L	3 L	5 L
<b>Modes of automation control</b>			
Set point profiling	●	●	●
Cascade-mode control	○	○	○
Recipe programming	●	●	●
Number of recipe stages	3	3	3
<b>Data management</b>			
Data Trend graph	●	●	●
Data Scatter plot	○	○	○
Data experiments comparative plot	●	●	●
Off-line data input for display in graphics and saving in batch file	○	○	○
Data export format	CSV / XLS	CSV / XLS	CSV / XLS
<b>Calculations</b>	○	○	○
<b>CFR 21 part 11</b>	-	-	-

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