New Brunswick Scientific
Where Quality and Innovation Have Become Tradition

75L - 1,500L BIOFLO® PRO FERMENTATION SYSTEMS

For Pilot Through Production.

Setting new standards for system design, delivery and affordability.

New Brunswick Scientific has created a revolutionary new line of large-scale fermentors, modular in design, to allow ready customization, quick delivery, and the ability to expand system capabilities as needs change. The sterilizable-in-place (SIP) **BioFlo Pro Fermentors** utilize robust, industry-standard components for dependable operation, and a programmable-logic controller (PLC) for easy integration into any production facility.

Smart Design

NBS has a thirty-year history of manufacturing large-scale fermentors. But, when it came to designing the **BioFlo Pro**, we started with a blank slate. What resulted was a fully modular system, capable of incorporating a large number of options. Features include:

- **Small footprint**, to minimize space requirements
- **Open piping frame** with plenty of space between valves, for easy access during operation and routine maintenance
- **Flush-mounted vessel connections** in hard-to-clean locations, to limit contamination risk
- **Easy customization** to suit a wide variety of specifications and budgets (Capable of field upgrades, too!)

Premium Performance

New Brunswick Scientific understands the importance of meeting demanding production schedules. That's why we've incorporated some of the most robust devices available into the **BioFlo Pro**, so you spend less time maintaining your equipment and more time using it. For optimal performance, our fermentors offer:

- **Adherence to cGMP and GaMP** guidelines*
- **Valves with an average lifetime of 5×10^6 cycles**
- **Industry standard PLC** for easy integration into any production environment

Efficient Scale-Up

New Brunswick Scientific incorporates the most advanced control features into all of our fermentation equipment, from our research-scale systems to the GaMP-compliant industrial control package at the heart of the **BioFlo Pro**. The result is a virtually seamless transition, with a minimal learning curve as you proceed from process development to pilot phase and beyond. In addition, we offer:

- **In-house microbiology labs** to assist with process development and scale-up
- **A worldwide network of factory-trained service engineers** to provide after-sales support

BioFlo Pro: Nothing Comes Close

New Brunswick Scientific's BioFlo Pro offers a unique solution for pilot and production-scale processing, combining dependable operation, system flexibility, increased throughput and quick delivery, all at an affordable price. Only the **BioFlo Pro** offers all these advantages….and much, much more.

Spring-Assisted Manway in 75 - 500L models provides quick and easy access to vessel interior and eliminates need for a mechanical headlift

Motorized Headlift provided on 1000 - 1500L vessels

SIP/CIP Addition Valves
Enable sterile transfer of liquids into the vessel for pH and foam control, or nutrient addition

3:1 Vessel Ratio
Optimized for fermentation. Designed and built to ASME and CE standards (500L vessel shown)

Modular Design with Numerous Options
Provides for ready customization, pre- or post-delivery

NA-Connects®
In hard-to-clean locations eliminate dead legs

25 mm Safety Ports
On lower side wall enable use of redundant probes or retractable housings

*cGMP – Current Good Manufacturing Practice, GaMP – Good Automated Manufacturing Practice

75L, 150L, 300L, 500L, 1,000L and 1,500L

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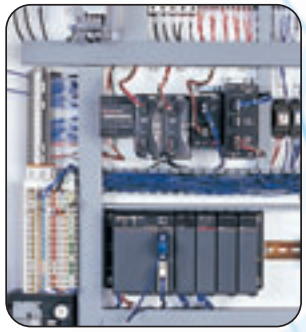
Headplate Ports
Accommodate septum, spray balls, level probes, level and pressure transmitters and vessel light

Open Piping Frame
Provides easy access to filters and valves for routine maintenance

Optional Transmitters
Measure and display pH/DO/Redox and/or weight



Control System, Featuring Industrial Programmable-Logic Controller (PLC)
Design based on GaMP guidelines

NEMA 4 Control Cabinet
Allows spray down for easy cleaning

Large Touch-Screen Interface
Provides clear viewing of process parameters

Fully Validatable
To cGMP and GaMP regulations

Unit pictured includes most available options

SIP/CIP Drain Valve
Designed to ensure 100% draining of vessel

Small Footprint
Allows installation in tight spaces

System Specifications*

Vessel *Total Vol.*	**75L**	**150L**	**300L**	**500L**	**1000L**	**1500L**
Working Vol.	**60L**	**120L**	**240L**	**400L**	**800L**	**1200L**
Construction	➢ Aspect Ratio: 3:1 ➢ Code Ratings: ASME/CE					
	➢ Material of construction: 316L SS ➢ Vessel Access: Spring-assisted manway					
	➢ Finish: 20 Ra [internal/external]. Optional: electropolished interior					
Agitation	➢ Drive: Bottom drive, double-mechanical seal					
	➢ Impellers: (3) Rushton ➢ Baffles: (4) removable, 316 L stainless-steel					
Speed (RPM)	50 - 500	50 - 500	45 - 450	40 - 400	30 - 350	30 - 300
AC Motor Size (hp)	1½	1½	5	5	10	20
Ports	Headplate 75 L	➢ (3) 1½″ Tri-clamps [DP transmitter/rupture disk/pressure transmitter] ➢ (4) 2″ Tri-clamps [spray balls/exhaust condenser/level probes/septum/vessel light]				
	Headplate 150L	➢ (3) 1½″ Tri-clamps [DP transmitter/rupture disk/pressure transmitter] ➢ (3) 2″ Tri-clamps [spray balls/exhaust condenser/level probes/septum] ➢ (1) 3″ Tri-clamp [exhaust condenser]				
	Headplate 300L / 500L	➢ (3) 1½″ Tri-clamps [DP transmitter/rupture disk/pressure transmitter] ➢ (1) 2″ Tri-clamp [vessel light] ➢ (3) 3″ Tri-clamps [spray balls/exhaust condenser/level probes/septum]				
	Headplate 1000L / 1500L	➢ (2) 1½″ Tri-clamps [rupture disk/level probes] ➢ (1) 2″ Tri-clamp [vessel light] ➢ (3) 4″ Tri-clamps [spray balls/exhaust condenser/level probes/septum]				
	Upper Side Wall 75L / 500L	➢ (1) ¾″ NA-connect® [gas overlay] ➢ (5) ½″ Tapered Tri-clamps [SIP/CIP addition valves] ➢ (1) 1½″ Tapered Tri-clamp [pressure gauge] ➢ (1) 4″ Tapered Tri-clamp [viewing port]				
	Upper Side Wall 1000L / 1500L	➢ (1) 1½″ NA-connect® [gas overlay] ➢ (1) 1½″ Pressure gauge ➢ (3) ½″ Tapered Tri-clamp [SIP/CIP/addition valves] ➢ (2) 1″Tapered Tri-clamp [SIP/CIP/addition valves] ➢ (1) 3″ Tapered Tri-clamp [Upper DP transmitter] ➢ (1) 6″ Tapered Tri-clamp [viewing port]				
	Lower Side Wall 75L / 500L	➢ (2) ¾″ NA-connects® [RTD/thermowell] ➢ (4) 25 mm Ingold ports [pH/DO/Redox/spare pH/spare DO] ➢ (2) 1½″ NA-connect® [sample valve/sample system/sparge]				
	Lower Side Wall 1000L / 1500L	➢ Same as 75 - 500L Lower Side Wall except (1) additional 2″NA-connect® [sparge]				
	Bottom 75L	➢ (1) 1″ Drain valve ➢ (1) Drain flange ➢ (1) 1½″ Na-connect® Lower DP transmitter]				
	Bottom 150L / 500L	➢ (1) 1½″ Drain valve ➢ (1) Drain flange ➢ (1) 1½″ Na-connect® Lower DP transmitter]				
	Bottom 1000L / 1500L	➢ (1) 2″ Drain valve ➢ (1) Drain flange ➢ (1) 3″ Na-connect® Lower DP transmitter]				
Piping Skid *Air Line*	➢ Material of construction: 316L SS ➢ Gaskets/O-rings: EPDM and Silicon Line comes equipped with rotameter, SIP inlet filter, and sparger. Options include: ➢ Thermal mass flow controller ➢ Dual inlet air filters (in series) ➢ Oxygen supplementation ➢ Dual inlet air filters w/ integrity-test ports ➢ Overlay valve					
Exhaust Line	Line designed for minimal backpressure, unregulated, and comes standard with heated exhaust filter and manual backpressure regulator. Options include: ➢ Automatic backpressure control ➢ Dual exhaust filters (in parallel) ➢ Exhaust condenser ➢ Dual exhaust filters w/ integrity-test ports					
Temperature Control Line	All systems come with automatic sterilization as the standard. The line is designed to achieve temperature rises of 1°C/minute. Options include: ➢ Glycol Heat Exchanger					
Sensor Options	➢ pH/DO kit ➢ Redundant probe kit ➢ Retractable probe housing ➢ Redox probe and transmitter					
Controller	Each system comes standard with an industrial (PLC) programmable-logic controller, designed based upon GaMP guidelines, and a large color touchscreen operator interface that is used to access multiple screens and functions					
Dimensions *W x D x H*	➢ **75 - 150L:** 6′5″ x 4′1″ x 8′ (1.6 x 1.24 x 2.44 m) ➢ **300 - 500L:** 6′9″ x 4′8″ x 10′3″ (2.06 x 1.42 x 3.12 m) ➢ **1000 - 1500L:** 7′1″ x 6′9″ x 15′3″ (2.16 x 2.06 x 4.65 m)					
Additional Options	➢ 21 CFR 11 compliant digital chart recorder ➢ Novaseptum® sampling systems ➢ Inputs for ancillary devices ➢ (4) User-definable fixed speed pumps ➢ Variable speed pumps ➢ Foam/level kits ➢ Vessel volume via differential pressure ➢ 316L SS addition vessels ➢ 7- or 12-port septum ➢ CIP interface/spray balls ➢ Load cells ➢ Marine and pitched-blade impellers ➢ Validation packages ➢ Scales for addition vessel					

*Specifications subject to change without notice. NA-connect® and Novaseptum® are registered trademarks of NovAseptic AB, Nödinge, Sweden.

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