New Brunswick Scientific
Where Quality and Innovation Have Become Tradition

75L, 150L & 300L BIOFLO® PRO
CELL CULTURE BIOREACTORS
Customizable Systems for Pilot Through Production.
New Brunswick Scientific has introduced BioFlo Pro Bioreactors—a new line of large-scale systems for cell culture. These advanced systems offer a unique solution for pilot through production-scale bioprocessing, combining quick delivery, dependable operation and system flexibility, all at an affordable price.

**Smart Sterile Design**

NBS has a thirty-year history of manufacturing large-scale bioreactors and fermentors. Our new fully modular BioFlo Pro Bioreactors are designed to meet a variety of process specifications with dependable operation and system flexibility. Design advantages include:

- **Small footprint** to enable installation in tight spaces. (150L vessel shown.)
- **Easy addition of options** at your site, any time
- **Open piping frame** for easy access during operation and routine maintenance
- **Flush-mounted vessel ports** in strategic locations to enhance our sterile design
- **Specialized impellers** for use in suspension and anchorage-dependent systems to increase yields

**Premium Performance**

We understand the importance of meeting demanding production schedules, so we’ve incorporated robust devices into the BioFlo Pro to minimize maintenance and downtime. For optimal performance our bioreactors offer:

- **Design adherence to cGMP and GaMP guidelines**
- **Quality components** such as valves with an average lifetime of $5 \times 10^6$ cycles
- **Industry-standard PLC** for easy integration into production environments
- **NEMA 4—rated control cabinet** with user-friendly touch-screen interface
- **Optional SCADA software packages** for process control

**Unparalleled Support**

New Brunswick Scientific offers training and a wide range of services to minimize start-up time and to provide ongoing support. Services and offerings include:

- **In-house cell culture labs** to assist with process development, optimization and scale-up
- **Preventive maintenance and spare parts kits** to simplify system upkeep
- **A variety of validation packages** to shorten start-up time lines
- **Industry-standard components** to ease parts replacement and maintenance
- **A worldwide network of service engineers** to provide system support

**BioFlo Pro Bioreactors: Nothing Comes Close**

Only New Brunswick Scientific’s BioFlo Pro offers all these advantages … and much, much more.

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*cGMP – Current Good Manufacturing Practice, GaMP – Good Automated Manufacturing Practice
NA-connect® is a registered trademark of NovAseptic AB, Nödinge, Sweden.
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- **Headplate Ports**
  Accommodate septum, sprayballs, level probes, foam probes, pressure transmitters, rupture disk, vessel light, decanting columns and differential pressure transmitters

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

- **Large Touch-Screen Interface**
  User-friendly interface provides clear viewing of process parameters

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

- **SIP/CIP Addition Valves**
  Enable sterile transfer of liquids into the vessel for pH and foam control or nutrient and media additions

- **NEMA 4 Control Cabinet**
  Allows spray down for easy cleaning

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

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

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

- **Fully Validatable**
  To cGMP and GaMP regulations. Optional validation packages available
## System Specifications*

### Vessel Specifications

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<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>75 Liters</td>
<td>150 Liters</td>
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<tr>
<td></td>
<td>60 Liters</td>
<td>120 Liters</td>
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- **Construction**
  - Aspect Ratio: 1.9:1 Nominal
  - Material of Construction: 316L SS
  - Code Ratings: ASME/CE
  - Vessel Access: Optional Headlift
  - Internal Finish: 15 Ra (0.38 μm) Electropolished
  - External Finish: 35 Ra (0.89 μm) Brushed Ribbon Polish

- **Agitation**
  - Drive: Top Drive with double mechanical seal or optional magnetic drive

- **Speed (RPM)**
  - 0 – 250

- **AC Motor Size (hp)**
  - 1½

### Piping Skid

<table>
<thead>
<tr>
<th>Options</th>
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<tbody>
<tr>
<td><strong>Ports</strong></td>
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</table>
| (3) 1½” Tri-Clamps [DP transmitter/rupture disk/pressure transmitter/foam]
| (5) 2” Tri-Clamps [sprayballs/exhaust condenser/vessel light/decanter]
| Agitator Drive           |

<table>
<thead>
<tr>
<th><strong>Upper Side Wall</strong></th>
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| (5) ¼” NA-connects® [SIP/CIP addition valves/overlay/air wash]
| (1) 1½” NA-connect [SIP/CIP addition valve]
| (2) 1½” Tapered Tri-Clamps [pressure gauge/upper DP transmitter]
| (1) 3” Tapered Tri-Clamp [viewing port]

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<tr>
<th><strong>Lower Side Wall</strong></th>
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</table>
| (3) ¼” NA-connects [RTD/thermowell/sparge]
| (4) 25 mm Ingrid Ports [pH/DO/Redox/space pH/spare DO]
| (2) 1½” NA-connects [sample valve/sample system/lower DP transmitter]

### Bottom

- **Vessel Volume/Weight Options**
  - Vessel Volume via differential pressure
  - Load Cells

- **Vessel Addition Options**
  - Variable Speed Pumps
  - ½” Addition Valves (quantity up to 3)
  - (4) User-Defined Fixed-Speed Pumps
  - 1” Addition Valve
  - Scales for Addition Vessel
  - 7 or 12 Port Septum

- ** Sampling Valve (resterilizable)**

### Piping Skid

<table>
<thead>
<tr>
<th><strong>Air Line</strong></th>
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<tbody>
<tr>
<td>Air line comes equipped with rotameter, SIP inlet filter, sparger and single gas air control. Options include:</td>
</tr>
<tr>
<td>Thermal Mass Flow Controller (TMFC)</td>
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<tr>
<td>Four-Gas Control (air, O₂, CO₂, N₂)</td>
</tr>
<tr>
<td>with choice of 1 or 4 TMFC(s)</td>
</tr>
<tr>
<td>Dual Inlet Air Filters (in series)</td>
</tr>
<tr>
<td>Dual Inlet Air Filters with integrity-test ports</td>
</tr>
<tr>
<td>Dual Exhaust Filters with integrity-test ports</td>
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<tr>
<td>Overlay Valve Mass Flow Control</td>
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<thead>
<tr>
<th><strong>Exhaust Line</strong></th>
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<tbody>
<tr>
<td>Line designed for minimal backpressure, unregulated, and comes standard with heated exhaust filter and manual backpressure regulator. Options include:</td>
</tr>
<tr>
<td>Automatic Backpressure Control</td>
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<tr>
<td>Exhaust Condenser</td>
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<tr>
<td>Single or Dual Exhaust Filters with integrity-test ports</td>
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<tr>
<th><strong>Temperature Control Line</strong></th>
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<tbody>
<tr>
<td>All systems come with automatic sterilization. The line is designed to achieve temperature rises of 1°C/minute. Options include:</td>
</tr>
<tr>
<td>Glycol Chiller Heat Exchanger</td>
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<table>
<thead>
<tr>
<th><strong>Utility Filter Kits</strong></th>
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<tbody>
<tr>
<td>Main Steam Prefilter/Regulator Kit</td>
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<tr>
<td>Process Steam Regulator Kit</td>
</tr>
<tr>
<td>Water Prefilter/Regulator Kit</td>
</tr>
<tr>
<td>Instrument Air Prefilter/Regulator Kit</td>
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</tbody>
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<tr>
<th><strong>Sensor Options</strong></th>
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</thead>
<tbody>
<tr>
<td>pH/DO Probes and Transmitter(s)</td>
</tr>
<tr>
<td>Retractable Probe Housing</td>
</tr>
<tr>
<td>Redox Probe and Transmitter</td>
</tr>
<tr>
<td>Foam/Level/High High Foam</td>
</tr>
</tbody>
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### Controller

- Each system comes standard with an industrial programmable-logic controller (PLC), designed based on GaMP guidelines, and a large color touch-screen operator interface that is used to access multiple screens and functions

### Data Recording Options

- 21 CFR-Compliant Digital Chart Recorder
- Inputs (4–20mA) for ancillary devices

### Dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>66” x 53” x 82” (203 x 1.60 x 2.49 m) W x D x H</th>
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<tbody>
<tr>
<td>Headlift option requires additional height clearance; load cell option requires additional depth clearance</td>
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### Additional Options

- CIP Skid Interface and Sprayballs
- Low-Seal Pressure Switch
- Vessel Headlift

### Validation Options

- Basic IQ & OQ Validation Package
- Enhanced Validation Package
- Basic Plus IQ & OQ Validation Package
- CIP Sprayball Coverage Test

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

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