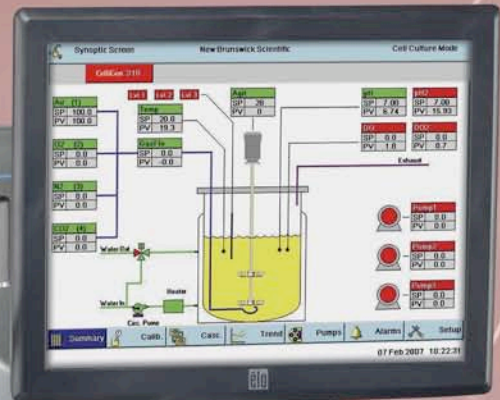
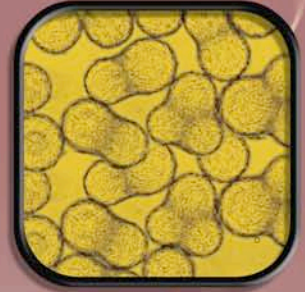




New Brunswick Scientific
Where Quality and Innovation Have Become Tradition

2.5L - 14.0L CELLIGEN® 310 BIOREACTOR SYSTEM

*The Ultimate Benchtop Bioreactor
for Research through Production*



The CelliGen® 310 Bioreactor — Advanced Control in a Compact Package.

New Brunswick Scientific has introduced one of the most capable benchtop cell culture bioreactors ever developed. Based on the proven technology of the CelliGen Plus, the new CelliGen 310 lets you easily connect and control your existing analyzers, pumps, sensors and other ancillary devices. A user-friendly touchscreen controller integrates it all, simplifying setup, calibration and operation. With the power to regulate up to 32 parameters each, in one to four vessels simultaneously, (over 120 parameters total), it's virtually impossible to outgrow the capabilities of this powerful system.

Sophisticated Bioreactor Has it All

- **Compact design** maximizes bench space.
- **cGMP-compliant** to meet your requirements in research through production.
- **Capable of batch, fed-batch & perfusion modes** for high-density growth of mammalian, plant and insect cell lines.
- **For secreted products, a patented packed-bed basket option** is available to maximize cell productivity regardless of cell type. (See our website for details and photo next page.)
- **Fully-integrated system is ready for out-of-the box startup.** Includes a Master Control Station with built-in controller, touchscreen monitor, pumps and thermal mass flow controller with 4-gas control. Vessel, pH/DO and level/foam probes, hoses & more are included.

Advanced Touchscreen Controller Simplifies Operation

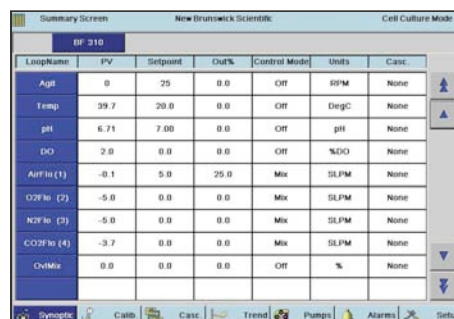
- **Large 15" touchscreen** clearly displays all setpoints, current values, cascade loops and more. Display screens are straightforward and easy to navigate.
- **Integrate up to ten of your sensors, scales, analyzers or other external devices** for process optimization.
- **User-customizable trend graphs** make it easy to track and export data. Trends up to 8 loops simultaneously.
- **Built in flexibility to customize all your PI values**, or select factory defaults.
- **Save up to 10 of your recipes** per bioreactor for repeat usage.

Available in Four Sizes With Multiple Options.

- **Interchangeable, autoclavable glass vessels** are available in four sizes. 2.5, 5.0, 7.5 and 14.0 liters, total volume.
- **Pre-configured packages simplify ordering.**
- **Customize by selecting from a wide range of options** including multiple mass flow controllers for individually controlling gas supplementation, or Redox or second pH and second DO probes, BioCommand® supervisory software & more. Validation & training packages are also available.



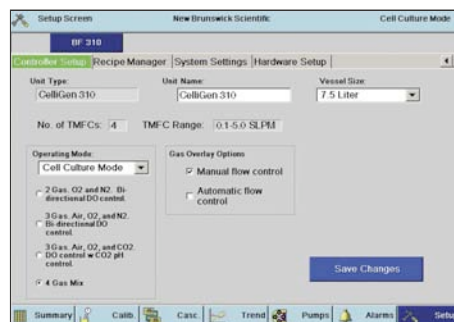
Packed with power, to regulate one to four bioreactors from a single controller!



Summary Screen lets you conveniently view setpoints, current values, cascade loops and more — for up to 10 parameters simultaneously. All 32 parameters can be viewed simply by scrolling up or down.



Trend graph screen makes it simple to track & export data on up to eight process variables over a six day span. Customize the view by selecting the parameters, colors & interval between sample measurements.



The setup screen lets you easily configure your settings — assign pumps, change vessel size for more accurate PI values, save up to 10 recipes, add additional bioreactors, and more.



Our new headplate design provides added flexibility so you can insert your probes, sampling tube, and exhaust gas condenser wherever you choose.



Standard Pre-Configured Packages

include a Master Control Station with vessel and probes to simplify ordering

Each Master Control Station

includes a controller & touchscreen monitor interface, capable of running one to four bioreactors

Cost-Saving Utility Stations for running optional 2nd, 3rd & 4th bioreactor(s) do not include controller & touchscreen interface

A Thermal Mass Flow Controller (TMFC) with 4-gas control is built into each Master Control Station and Utility Station to precisely control total gas flow rate. Additional TMFCs can be added for individual gas control

Connections for Gases & Vessel Components are easily accessible

Quick Connects allow utilities to be added in seconds

Optional Packed-Bed Basket filled with FibraCel® disks improves yields of secreted products

Optional Gas Overlay with or without Thermal Mass Flow Controller maximizes gas exchange

Adjustable-Angle, User-Friendly 15" Touchscreen Interface controls one to four bioreactors simultaneously

New synoptic screen provides pictorial alternative to the summary screen for viewing & editing process values

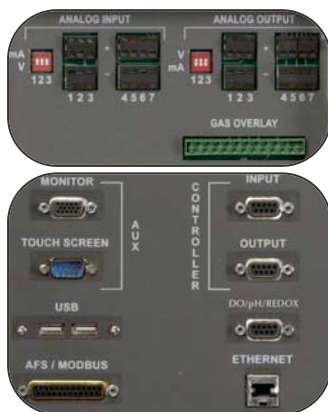
Customize PI Values for All Process Parameters or select factory defaults

pH, DO and Level/Foam Probes are provided. Options are available for Redox or 2nd pH probe, and 2nd DO probe

On-Off Switch is front mounted for easy access

Three Assignable Pumps are standard. Built-in controls and connections are provided for additional pumps. View total pump flow rate; and easily calibrate pumps via touchscreen

Water-Jacketed Vessel ensures uniform temperature control





Multiple connections are provided for integrating ancillary equipment, a second touchscreen display & BioCommand supervisory software. USB ports are provided for exporting trend data and importing firmware upgrades. All are easily accessed from the rear of the unit.



Specialized impellers maximize yields. **1. Spin Filter** with impeller for suspension or ADP cells in perfusion. **2. Patented double-screen Cell-Lift impeller** for low shear & high oxygenation in microcarrier and suspension cultures. Outer screen, shown partially retracted, can be removed for certain suspension cultures. If foam accumulates, it coalesces in the screened-in foam-inhibitor chamber at top of impeller and dissipates when forced through the screen's pores. **3. Patented low shear Draft-Tube Basket Impeller** (basket not shown) increases OTR in packed-bed cultures. **4. Pitched Blade Impeller** for high aeration and low shear in insect and other cell cultures. **5. Marine Blade Impeller** for the growth of insect cells and other cultures.

CelliGen 310 Bioreactor Specifications*

VESSEL VOLUME	Total Capacity	2.5 Liters	5.0 Liters	7.5 Liters	14.0 Liters
	Working Volume ▲	0.75 - 1.75 Liters	1.25 - 3.75 Liters	2.0 - 5.5 Liters	3.0 - 10.5 Liters
HEADPLATE PORTS	Size	(1) 6.35 mm (9) PG 13.5	(3) 6.35 & (1) 19 mm (10) PG 13.5	(3) 6.35 & (1) 19 mm (12) PG 13.5	(3) 6.35 & (1) 19 mm (12) PG 13.5
	Height w/ Cond./Filter	23" 58 cm	25.5" 65 cm	27" 69 cm	30" 76 cm
VESSEL DIMENSIONS for Autoclave	Without Cond./Filter	17" 43 cm	19.5" 50 cm	20.5" 52 cm	24.5" 62 cm
	Diameter	9" 23 cm	10" 25 cm	11.5" 29 cm	13" 33 cm
	Master Control Station	Controls 1 to 4 vessels, 32 control loops per vessel. Stores 10 recipes & 8 process variables for trend graphing, per vessel. Includes an industrial touchscreen monitor/ user interface, 3 built-in pumps, and connections for all utilities & communications signals used by the first bioreactor			
CONTROLLER	Utility Station	One each required for optional 2nd, 3rd or 4th reactors. Each includes 3 built-in pumps, and connections for all utilities & communications signals. Built with 7 analog inputs & 7 analog outputs			
	Touchscreen Interface Display	15" Industrial touchscreen interface / display capable of supporting up to four reactors is standard with a Master Control Station. Optional second touchscreen is available — and replicates the image shown on the first display			
TEMPERATURE	Indication & Sensor	Digital display in 0.1°C increments via Platinum RTD probe			
	Range & Control ◊	From 5°C above coolant temperature to 80°C via PID control.			
AGITATION	Drive	Permanent magnet motor with high torque input			
	Indication	Digital display in 1 RPM increments			
	Range & Control	25 - 500 RPM via PID control. 14L systems only: 25 - 150 RPM			
	Impellers	Select from Pitched Blade, Marine Blade, Spin Filter, Cell-Lift or Basket Impellers			
EXHAUST	Condenser & Filter	Stainless-steel exhaust condenser, mounted on the headplate. Uses 0.2µ disposable filter			
AERATION	Sparge Gas System	Standard: 1 Thermal Mass Flow Controller (TMFC) with four-gas control (built with 4 solenoid valves). 0.1 – 5.0 SLPM standard. Other options available Optional: 2nd, 3rd, 4th TMFC for individual gas control			
	Gas Inlet	Ring sparger is provided with 0.2µ disposable filter			
	Gas Overlay	Optional: 0 or 1 TMFC with 4 gas control (built with 4 solenoid valves)			
pH	Sensor	One gel pH probe with digital display in 0.01 increments. 2nd probe optional			
	Range & Control	2 - 14 pH via PID control. Cascade to pumps, gases and external loops			
DO	Sensor	One Polarographic DO probe with digital display in 0.1% increments. 2nd probe optional			
	Range & Control	0 - 200% via PID control. Cascade to agitation, gases, pumps and external loops			
OTHER SENSORS	Foam/Level	One Foam/Level sensor. (Two additional foam/level sensors can be added)			
	Optional Sensors	Redox or second pH probe, and second DO probe are available. (External sensors can be added)			
PUMPS	Standard, Options & Control	3 Built-in, assignable, peristaltic pumps are standard. External pumps can be added. Control modes: Off, Prime, Base, Acid, Foam, Level 2 Wet, Level 2 Dry, Level 3 Wet or Level 3 Dry			
	Speed	Pumps 1 & 2: 12 RPM Fixed speed duty cycle — ability to view total pump flow rates			
		Pump 3: 100 RPM Fixed speed duty cycle — ability to view total pump flow rates			
UTILITIES	Water & Gas	Water: 10 PSIG maximum, 50 µ filtration. Gas: 10 PSIG maximum			
ELECTRIC	Service	100 - 120 V 50/60 Hz & 208 - 230 V 50/60 Hz. All are single phase, and draw 15 Amps			
NET WEIGHT	Control Station	88 lbs. [40 kg], including 15 lb. [6.8 kg] touchscreen			
	Vessel without motor †	22 lbs. 10 kg	24 lbs. 11 kg	34 lbs. 15.5 kg	51 lbs. 23 kg
DIMENSIONS wide x deep x high	Utility Station	With touchscreen: 25" x 24" x 34" (63.5 x 61 x 86 cm). Without: 18" x 24" x 28" (46 x 61 x 71 cm)			
INPUT / OUTPUT CONNECTIONS & COMM PORTS (Built into the back panel of Master Control & Utility Stations **)	External Devices	Seven analog inputs & seven analog outputs for your external devices such as analyzers, sensors, external pumps, etc. (Reduce by 1 input & output for each additional TMFC added)			
	2 USB Ports**	Import firmware/software upgrades and export trend data. Connect optional 8-port serial box for scales, etc. (USB ports built into Master Control Station only)			
	Communications Port	For optional BioCommand/SCADA software			
	Auxiliary Monitor	For optional second touchscreen display			
	Secondary Probes	Optional for Redox or second pH probe, and a second DO probe			
REGULATORY COMPLIANCE	  CAN/CSA-C22.2 Nos. 1010.1 & 1010.2.010 UL Standard UL-61010A-1 & 61010A-2.010				

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* Subject to change, without notice. ▲ With Basket and Cell Lift Impellers, you must use the maximum working volume.

◊ Ambient operating conditions of 10 to 30°C, up to 80% relative humidity, non-condensing. † Vessel weight does not include probes, condenser or other options. Motor adds 12.5 lbs, 6.8 kg Net. ** USB Ports built into Master Control Station only.



New Brunswick Scientific Co., Inc.