

BIOBOOK COMPACT



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Biobook Compact: Empowering Researchers with a User-Friendly and Feature-Rich Bioreactor System

The Biobook Compact, developed by Vinci Life Science Applied SA, is a bench-scale bioreactor/fermentor system designed to cater to the diverse needs of researchers and developers. This compact system offers a range of features and capabilities for various applications. With its user-friendly design, the Biobook Compact is an ideal choice for scientists seeking a versatile and efficient solution.

The system includes interchangeable autoclavable Pyrex 3.3 glass vessels, which are available in heat-blanketed and water-jacketed options. Additionally, the Biobook Compact supports using SUB Single-Use bioreactors, allowing researchers to select the working volume that suits their specific requirements, ranging from 300mL to a maximum of 20L.

Vinci Life Science Applied SA offers a wide range of sensors that enable users to monitor and control crucial parameters such as pH, redox, dissolved oxygen, biomass, and carbon dioxide without additional equipment. This integration simplifies the process and enhances efficiency.

The Biobook Compact allows the customer to choose any other third-party sensors, as long as they use the 4-20mA protocol for communication.

The Biobook Compact also incorporates a high-precision extended range thermal mass flow controller, allowing precise calibration specific for each gas. It is possible to equip the Biobook Compact with MFC for the most common gasses such as: O₂, CO₂, compressed Air, etc. But it is also possible to connect MFC for more particular options such as H₂ or AR.

This controller precisely controls gas flow rates, accommodating a wide range of applications, from low-flow mammalian cell culture to high-demand microbial processes.

The inclusion of a single controller for gas flow management enhances operational convenience and flexibility.

Vinci Life Science Applied SA's Biobook Compact offers researchers a flexible and compact bioreactor/fermentor system, ideally suited for various levels of research and development. With its hardware technology integrated in the Bioflex Software, interchangeable vessel options, and precise gas flow control, the Biobook Compact provides an efficient and reliable platform for scientific investigations and process development in a compact form factor



Customizability and Expandability of the Biobook Compact

One of the key advantages of the Biobook Compact, developed by Vinci Life Science Applied SA, lies in its exceptional customizability and expandability. Recognizing that researchers often have specific requirements and preferences for their bioreactor/fermentor systems, Vinci Life Science Applied SA has designed the Biobook Compact to be highly adaptable, allowing users to tailor the system according to their needs.

One aspect of customization is the availability of add-ons ancillaries that can enhance the functionality and versatility of the Biobook Compact.

The system thanks to its universal connections protocols such as:

- 4-20 mA
- Modbus 485
- Modbus 232

Can connect to most of the already present sensors and ancillaries on the market.

Each headplate and each vessel can be custom-made to fit into any type of scientific experimentation.

Custom projects for PBR and Airlift Bioreactor can be included.

Applications

The Biobook Compact by Vinci Life Science Applied SA offers a wide range of applications, making it suitable for diverse research and development purposes:

- Bacterial fermentation
- Yeast fermentation
- Fungal fermentation

- Batch Fermentation: The Biobook Compact allows researchers to perform batch fermentations, where a fixed volume of culture medium is inoculated and allowed to grow until the desired end point is reached. Batch fermentation is commonly used for process development, strain characterization, and production of metabolites.

- Fed – batch Fermentation: This mode of fermentation involves the addition of nutrients or substrates during the cultivation process to sustain prolonged cell growth and enhance the production of desired products. The Biobook Compact supports fed-batch fermentations, enabling researchers to optimize productivity and yield.

- Continuous Fermentation: The Biobook Compact offers the capability for continuous fermentation, where fresh medium is continuously added, and culture both is simultaneously removed. This mode allows for stable, long-term cultivation and is suitable for studies requiring a constant supply of products or metabolites.

- Perfusion Cultures: Researchers can utilize the Biobook Compact for perfusion cultures, a technique involving continuous medium exchange while retaining cells within the system. Perfusion cultures are commonly used for high-density cell growth and the production of sensitive biologics, such as monoclonal antibodies.

The Biobook Compact's versatility and flexibility in accommodating various cell types, fermentation processes, and cultivation modes make it an ideal choice for a broad range of applications in the fields of cell biology, biotechnology, pharmaceutical development and industrial bio processing.

Biobook Compact Specifications

Control Unit		
	<u>Imperial Unit</u>	<u>Standard Unit</u>
Dimensions:	10.43" W x 13.78" H x 15.94" D	265Wx350Hx405D
HMI:	Bioflex software able to run any Windows © running systems, the computer can be directly purchased with the bioreactor system.	
Communication:	2 ethernet ports for direct connection	
<u>Utility</u>	<u>Connection</u>	<u>Requirement</u>
Electrical:	IEC-C14 (with regional plug types)	100-120/208 – 240 (±10%) V, 50/60Hz, 10A, Single Phase
Water:	Quick connection (only for models with no chiller)	1 barg max, recirculating pressure for tap water. No water source required in case of chiller purchase.
Gas supply:	Quick connection	2 bar gas lines for each gas

Sensors

<u>Available Sensor</u>	<u>Range</u>	<u>Communication protocol</u>
pH (Arc Hamilton Series or Other)	pH 0 to 14	4-20 mA or Modbus 485
DO (Arc Hamilton Series or Other)	4 ppb to 25 ppm (DO) 0 to 62.85 %-vol or 0 to 300 %-sat	4-20 mA or Modbus 485
Biomass (Arc Hamilton Series or Other)	$\lambda=860$ nm (NIR) - e.g. 0-200g/l cell dry weight yeast - 0-4 AU - 0-30'000 NTU	4-20 mA or Modbus 485
ORP (Arc Hamilton Series or Other)	-1500mV to +1500mV	4-20 mA or Modbus 485
DCO2 (Arc Hamilton Series or Other)	5 - 1000 mbar or 0.5 - 100 % vol or 7.5 - 1500 mg/L in liquid phase at 101.3 kPa and 25°C	4-20 mA or Modbus 485
Conductivity (Arc Hamilton)	1 μ S/cm to 300 mS/cm	4-20 mA or Modbus 485
PT100 (Temperature sensor)	+100°C / + 150°C	4-20 mA
Antifoam Sensor	No range (on-off relais)	4-20 mA

Gas analyzer system

<u>Gas</u>	<u>Range</u>	<u>Communication protocol</u>
CO2	0-500ppm 0-1% / 0-1000ppm 0-3% / 0-2000ppm 0-5% / 0-3000ppm 0-10% / 0-5000ppm 0-30% / 0-100%	4-20 mA
O2	0-25%	Modbus RS 485
CH4	0-1% / 0-5% / 0-10% / 0-30% / 0-100% / 0-100% Biogas	4-20 mA
CO	0-3% / 0-10% / 0-30% / 0-100%	4-20 mA
H2	0 ~ 99.999%	Modbus RS 485 (standard) – RS232 (optional)
Custom gas	-	-

Pumps

<u>Motor type</u>	<u>Range</u>	<u>Number per Unit</u>
Fixed speed DC Motor	1-45 ml/min	1-4
Stepper variable speed Motor	1-45 ml/min	1-4

Agitation

<u>Type of drive</u>	<u>Available speed</u>	<u>Available for:</u>
DC Motor	50 RPM to 1200 RPM	Every SQVESSEL – QVESSEL and SUB Vessel
Brushless Motor	50 RPM to 1200 RPM	Every SQVESSEL – QVESSEL and SUB Vessel
Magnetic Stirrer	Custom*	Custom*

Gas Rotameters

<u>Range</u>	<u>Gas</u>	<u>Number of Rotameters</u>
500-20 lt/min	Any gas, custom label	1-4

MFC

<u>Range</u>	<u>Gas</u>	<u>Number of MFC</u>
10cc-20 lt/min	Any gas	1-4

Thermo Regulation Options

<u>Type</u>	<u>Range</u>	<u>External Utilities required</u>
Thermo Chiller Peltier for SJ Vessel + heating mantle	15°C- 45 °C (Environment Temperature Dependent)	No
Thermo Chiller Peltier for DJ Vessel	Cooling capacity up to 220 W / Heating capacity up to 500 W	No
Heat Exchanger	Custom Range	Yes, Glycol or cooled water line
Cold finger (tap water connection) + heating mantle for SJ Vessel	15°C- 45 °C (Environment Temperature Dependent)	Yes, tap water

Vessel Compatibility

<u>Vessel Type</u>	<u>Size</u>	<u>Customization</u>
QVESSEL (Double wall)	300ml to 20L	Yes
SQVESSEL (Single wall)	300ml to 20L	Yes
QXVESSEL (Single and double wall inox vessel)	Up to 20L	Yes
SUB Vessel	100ml to 20L	No

Connectivity ti probes

Number of ports

Type of connectivity

4

Modbus 485 Ports

2

4-20 mA ports

Specifications are subject to change without notice

Spec. Version A



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