

BIOBOOK COMPACT TWIN



Vinci Life Science Applied SA
+41 91 630 0115
Head office: Via Cantonale, 69 - 6805 Mezzovico
Production Site: Via Penate, 16 - 6850 Mendrisio



Biobook Compact Twin: Optimize your bioprocesses with this dual reactor solution for enhanced productivity

The Biobook Compact Twin, developed by Vinci Life Science Applied SA, is an advanced bench-scale bioreactor/fermentor system designed to meet the diverse needs of researchers and developers. This twin version offers all the features and capabilities of the Biobook Compact while providing the added advantage of connecting two reactors simultaneously. With its user-friendly design and enhanced functionality, the Biobook Compact Twin is the perfect choice for scientists seeking versatile and efficient solutions for their experiments.

Similar to its single reactor counterpart, the Biobook Compact Twin includes interchangeable autoclavable Pyrex 3.3 glass vessels, available in heat-blanketed and water-jacketed options. This allows researchers to optimize their experimental conditions based on their specific requirements. Moreover, the system fully supports the use of SUB Single-Use Bioreactors, offering a range of working volumes from 300 mL up to a maximum of 20L for each reactor, providing flexibility and scalability.

One of the key features of the Biobook Compact Twin is its integrated sensor technology, which enables users to monitor and control crucial parameters such as pH, redox, dissolved oxygen, Biomass, and carbon dioxide without the need for additional equipment. The system also supports the integration of third-party sensors, as long as they utilize the 4-20 mA protocol for communication. This seamless sensor integration simplifies the monitoring process and enhances overall efficiency.

In terms of gas flow control, the Biobook Compact Twin incorporates a high-precision extended range thermal mass flow controller for each reactor. This feature allows precise calibration specific to each gas, ensuring accurate and reliable gas flow rates. Researchers can equip the Biobook Compact Twin with MFCs for commonly used gases such as O₂, CO₂, and Compressed Air, as well as more specialized options like H₂ or Ar. The single controller for gas flow management provides operational convenience and flexibility for a wide range of applications, from mammalian cell culture with low-flow requirements to microbial processes with high-demand gas flows.



Customizability and Expandability of the Biobook Compact Twin

One notable aspect of the Biobook Compact Twin is its ability to accommodate various add-ons and ancillary devices, which can greatly enhance its functionality and versatility. The system is designed to be compatible with a wide range of existing sensors and ancillaries available in the market. This means that researchers can seamlessly integrate their preferred equipment into the Biobook Compact Twin, making it a flexible and adaptable solution for their experiments.

The system supports universal connection protocols such as 4-20 mA, Modbus 485, and Modbus 232, enabling easy connectivity with different types of sensors and ancillary devices. This compatibility ensures that researchers can leverage their existing equipment without the need for significant modifications or additional investments.

Another aspect of customization offered by the Biobook Compact Twin is the option to create custom-made head plates and vessels. This feature allows researchers to tailor the system to their specific scientific requirements. Whether working with photobioreactors (PBRs) or airlift bioreactors, the Biobook Compact Twin can be designed to accommodate these specialized projects. This flexibility in design and configuration, as well as the hardware technology integrated in the Bioflex software ensures that researchers can optimize the system's performance for their specific experiments.

Applications

The Biobook Compact Twin 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 Twin allows researchers to perform batch fermentations, where a fixed volume or culture medium is inoculated and allowed to grow until the desired endpoint 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 Twin supports fed-batch fermentations, enabling researchers to optimize productivity and yield

- Continuous Fermentation: The Biobook Compact Twin 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 Twin 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.

Biobook Compact Twin Specifications

Control Unit

Imperial Unit

Standard Unit

Dimensions:

14.0" W x 17.7" H x 20.7" D

355W x 450H x 527D

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

Utility

Connection

Requirement

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

Operating conditions:

0-30° C, up to 80% RH, non - condensing

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
DCO ₂ (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 variabel 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 rotameter</u>
(500-20 lt/min)	Any gas, custom label	2x (1-4) – one for each unit

MFC

<u>Range</u>	<u>Gas</u>	<u>Number of MFC</u>
10cc-20 lt/min	Any gas	2x (1-4) – one for each unit

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/double wall inox vessel)	Up to 20L	Yes
SUB Vessel	100ml to 20L	No

Connectivity ti probes

<u>Number of ports</u>	<u>Type of connectivity</u>
2x4 (four for each unit)	Modbus 485 Ports
2x2 (four for each unit)	4-20 mA ports

Scales

<u>Size</u>	<u>Communication protocol</u>
Depending on the vessel different available sizes	4-20 mA / RS 232

Specifications are subject to change without notice

Spec. Version A



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