

BIOBOOK UP 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 UP Twin

The Biobook UP Twin, developed by Vinci Life Science Applied SA, is an innovative bioreactor/fermentor system that builds upon the capabilities of the Biobook UP, with the added advantages of simultaneous control over two reactors. This advancement offers researchers increased efficiency and productivity in their scientific investigations and process development endeavours.

DUAL REACTOR CONTROL:

The Biobook UP Twin introduces dual reactor control, allowing researchers to independently manage and monitor two reactors simultaneously. With this enhanced capability, scientists can conduct parallel experiments, compare different experimental conditions, and optimize process parameters more efficiently.

MODULAR DESIGN AND FLEXIBILITY:

Similar to the Biobook UP, the Twin version is built upon a modular framework, providing enhanced flexibility and adaptability for specific experimental requirements. The system boasts an expanded number of ports for probes, facilitating the seamless integration of a wider range of sensors for each reactor. This modular design enables researchers to tailor their experimental setups and monitoring configurations to suit the specific needs of each reactor, promoting versatility and customization.

ADVANCED LIQUID HANDLING:

Acknowledging the critical role of accurate liquid handling in bioprocessing, the Biobook UP Twin features an upgraded pumping system with dual sets of peristaltic pumps. This allows precise control over media addition, feed strategies, and sample collection for each reactor independently. The advanced liquid handling capabilities empower scientists to design complex feeding regimes, conduct parallel experiments with different media compositions, and explore diverse process conditions with ease.



EXPANDED GAS CONNECTIVITY:

The Biobook UP Twin addresses the diverse gas requirements encountered in bioprocesses by offering an expanded range of gas connectivity options for both reactors. Researchers can connect a wider variety of gases, including O₂, CO₂, compressed air, and specialized gases like H₂ or Ar, to each reactor individually. This increased gas compatibility enables scientists to explore a broader spectrum of applications and fuels innovation in diverse fields, facilitating microbial fermentation to mammalian cell culture in both reactors simultaneously.

INTEGRATION OF THIRD-PARTY SENSORS

Similar to the Biobook UP, the Twin version provides an increased number of probe ports for each reactor, allowing researcher to connect and integrate a greater variety of sensors. This expansion in probe connectivity enables scientists to monitor and measure multiple parameters simultaneously in both reactors. By capturing a more comprehensive view of the bioprocess dynamics in each reactor, researchers can gain deeper insights and make informed decisions to optimize process conditions and achieve superior experimental outcomes.

The Biobook UP Twin's advanced probe connectivity and dual reactor control promote greater experimental flexibility and sophistication. Researchers can explore complex process configurations, conduct comparative studies, and investigate interactions between different experimental conditions across two reactors simultaneously. The system allows scientists to select the most suitable combination of sensors for each reactor, facilitating precise monitoring and control of key parameters throughout the bioprocessing cycle in both reactor independently. This level of control and data acquisition empowers researchers to unlock new avenues of scientific exploration, optimize processes, and drive innovation in bioprocessing research and development.

Biobook UP Twin Specifications

Control Unit		
	<u>Imperial Unit</u>	<u>Standard Unit</u>
Dimensions:	Width: 15.9 inches Height: 8.7 inches Depth: 17.7 inches	405W x 220H x 450D
HMI:	Bioflex software able to run any Windows © running systems, the computer can be directly purchased with the bioreactor system	
Communication: 2 x each Unit of the following	N.4 Modbus 485 Ports N.4 4-20 mA Ports N.1 Mixer motor Port N.1 Data Chiller RS 232-Modbus Port N.1 Heating mantle Port N.1 ETH Port (PC)	
<u>Utility</u>	<u>Connection</u>	<u>Requirements</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
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
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	2x (1-4) – one for each unit
Stepper variable speed motor	1-45 ml/min	2x (1-4) – one for each unit

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 and 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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