



LAB1ST

- > *Microbial Cultivation*
- > *Twin Control System*
- > *Economical and Efficient Choice*

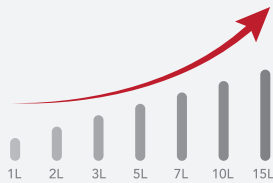
BIOREACTOR

BR100-M2

Efficient Parallel Processing Solution for Microbial Cultivation

Quick Overview of BR100-M2

- Cost-effective and streamlined: Dual-vessel configuration for microbial cultivation.
- Versatile dual-vessel control: Enables simultaneous operation of two vessels of the **same or different sizes** for diverse bioprocessing needs.
- Versatile total volumes: 7 options from 1L to 15L for diverse scales.

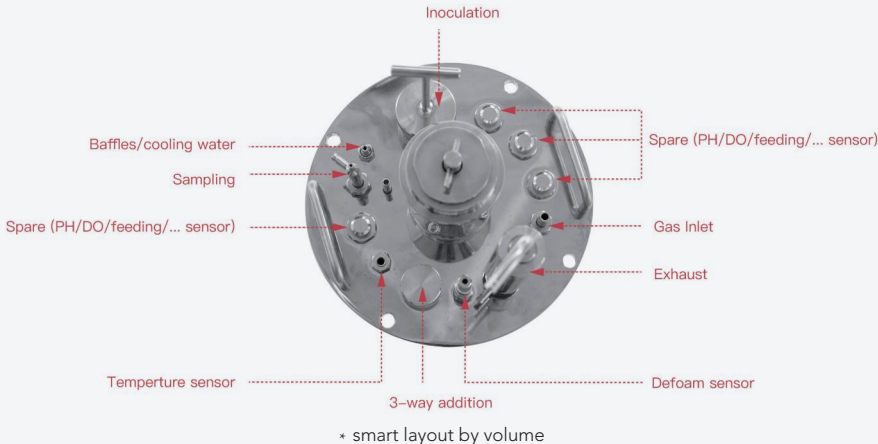
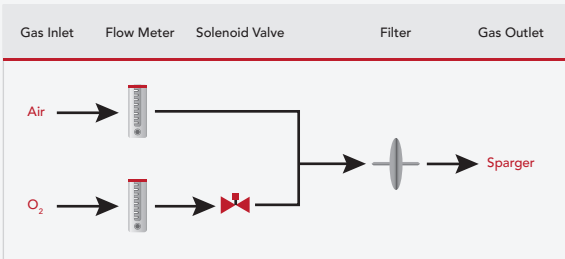


- Flexible customization: Extensive upgrades and bespoke solutions for special needs.
- Mature vessel manufacturing process: easy to disassemble, maintain and clean.

- Reliable performance and precise control: Core hardware from leading international brands ensures stability.
- Quick installation and easy to use: small footprint and easy installation.
- Powerful software functions: Full control via feedback, time, conditions, scripts, etc.
- Supports recipe sharing, synchronized comparison of parameter curves, and synchronized setting and control of parameters.
- Intuitive interface: **10.1-inch** touchscreen with graphical design language.
- Remote communication: Wired and wireless LAN for remote monitoring and control.



At-a-Glance BR100-M2 Configuration

Controller	Siemens PLC + 10.1-inch MCGS HMI; Remote monitoring and control within LAN
Glass Vessel [Each]	Total volume 1-15 L with 25~75% working volume, autoclavable; Single-wall flat-bottom cylindrical vessel, borosilicate 3.3 glass, electrolytically polished SUS 316L; With pH, DO, temp., foam electrode interface, sparger, exhaust port, inoculation port, feeding port, sampling port, etc.  * smart layout by volume
Agitation	Top mechanical stirring, servo motor, 5-1000rpm; Comb type defoaming impeller, 4-blade impeller (based on volume), Rushton impeller 
Gas Intake	Each vessel: 2-way gas supply (Air + O₂), 1 ring sparger, max. 2 vvm - Air: rotameter - O₂: rotameter + solenoid valve 
Exhaust	Exhaust condenser
Sensor	Hamilton® pH; Hamilton® DO; German JUMO Pt100 RTD; Foam
Pump	Each vessel: 4 fixed-speed peristaltic pumps for acid, alkali, defoamer and feed

Features

Performance Meets Affordability with Uncompromised Quality

- The BR100-M2 bioreactor is developed based on years of industry experience and customer feedback, offering a simple yet efficient design that balances performance and cost.
- It features top-class components from trusted brands like **Siemens**, **Hamilton**, and **Jumo**, ensuring reliable, continuous monitoring and stable operation throughout the biological process.
- The combination of rotameters, solenoid valves and built-in integrated peristaltic pumps achieves reliable gas and feeding control.
- Its compact design minimizes space usage, making the most efficient use of laboratory space while boosting high performance and functionality.



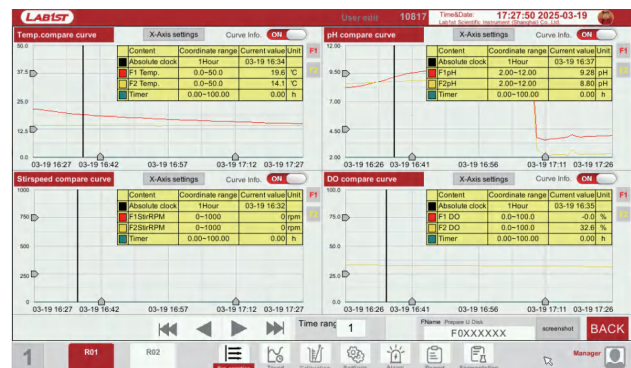
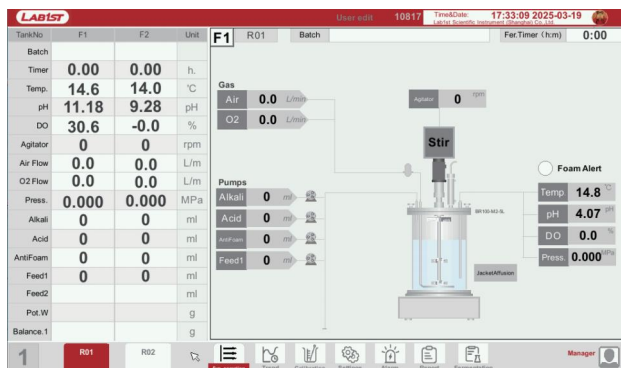
Simple Operation and Hassle-Free Maintenance

- The complete kit includes everything needed for the application, pre-configured, and ready to use, without the need to purchase additional accessories.
- No tools are required, and the user-friendly interface design makes installation simple and simplifies the preparation work before the process starts.
- The separation of the base, vessel body and stirring motor enables a lightweight design, making it easier for experimenters to transfer it to the sterilizer.
- The 10.1-inch touchscreen, combined with a simple and intuitive software design, offers full support for biological processes, making operation no longer complicated.
- All components are located on the vessel lid, allowing for easy disassembly and reassembly, simplifying cleaning and maintenance.

Flexible, Reliable, and Fully Integrated System

Software Functions: Precision Control and Full Process Flexibility

- Supporting recipe sharing, synchronized comparison of parameter curves, and synchronized setting and control of parameters, enhances efficiency and consistency in experimental design and process optimization.
- Multiple cascades for DO control by means of agitation speed, oxygen bypass, and feed, increasing process control flexibility.
- Up to 24 recipes, with no theoretical upper limit on steps, to achieve automatic operation of the biological process.
- Comprehensive control including manual, automatic, sequential, cascaded, conditional, etc. meets different experimental needs.
- Easily perform online calibration for sensor and peristaltic pump ensures accurate and reliable process control.
- Extensible real-time display trend chart for easily viewing your entire biological process.
- Complete batch data, alarm and operation records, easy to query, export and backup. With 8G ROM, data can be saved for many years.
- Three-level authority management and upper & lower limit alarm settings reduce risks.
- Wireless and wired LAN communication, easily realize remote monitoring and control.



Glass Vessel: Optimal Design for Efficient Cultivation

- The single-wall flat-bottom cylindrical vessel is equipped with a heating base. The stainless steel bottom makes it more sturdy and reliable, and has good heat conduction.
- Electropolished 316L stainless steel, borosilicate 3.3 glass, EPDM and silicone sealing, clean and hygienic.
- Standard 2:1 height-to-diameter ratio, meeting most mass transfer and heat transfer requirements.
- Sufficient interfaces to meet the installation requirements of standard accessories and sensors.
- Knurled screw design for quick assembly, easy cleaning and maintenance.

Hardware Configuration: Reliable Performance and High-Quality Components

Gas Flow

- Standard configuration: 2 gas sources for air and oxygen, ring sparger, max. 2vvm, optimized for the microbial fermentation.
- The combination of rotameter and solenoid valve meets the economical and effective gassing strategy.
- Both the gassing intake and exhaust are equipped with premium Sartorius PTFE 0.2µm filters to prevent contamination.
- Exhaust through the optimized exhaust condenser helps to recover volatile components and maintain a good fermentation environment.

Stirring & Impeller

- Top mechanical stirring, maintenance-free servo motor, quick response, no delay in starting, max. 1000 rpm.
- Standard Rushton impeller, optimized for fermentation processes with high mass transfer efficiency and insensitivity to shear force.
- Comb-type defoaming impeller, mechanically eliminates top foam and improves mass transfer.
- The impellers are height-adjustable and detachable, increasing flexibility and reducing maintenance costs.

Feeding

- 8 fast-load fixed-speed peristaltic pumps for adding acid, alkali, defoamer and feed, with customizable functions, realize automatic control and metering.

Sensor

- Hamilton® pre-pressurized gel-filled pH sensor with durable PHI glass membrane designed for sterilization.
- Hamilton® Polarographic DO Sensor with FDA-approved dissolved oxygen membrane for hygienic processes.
- German JUMO Pt100 RTD, fast response and durable.
- Conductivity foam sensor realizes automatically adding defoamer through the peristaltic pump, which is stable and reliable.

Compliance

- CE certified, ensuring full compliance with the essential health, safety.



INNOVATIVE BIOREACTOR
SOLUTIONS FOR YOUR RESEARCH

Specification - Control Capacity

Independent Control Tower

Housing Material	Carbon steel, plastic powder coating						
Dimensions [WxDxH, mm]	400×550×760						
Weight [kg]	Approx. 40 kg [depending on configuration]						
Display I Operation	10.1" color touchscreen						
Controller	Siemens S7-200 Smart PLC, MCGS HMI						
Integrated Pump	8 fixed-speed fast-loading peristaltic pumps						
Flow Meter	4 rotameters						
Communication	USB [software upgrade, data copy and export], Industrial Ethernet, WiFi						
Interface	· 2 x pH sensor cable · 2 x DO sensor cable · 4 x stirring motor control wires · 2 x temperature sensor interface · 2 x foam sensor cable · 2 x heating base control wire interface · 1 x main power interface						
Water Interface	12 × hose barb fitting [inlet/outlet for exhaust condenser, base jacket and chilled water]						
Air Interface	4 × hose barb fitting [2 x gas supply interface, 2 x gas outlet]						
Power Supply	220V (±10%), 50Hz, single phase						
Adaptable Vessel, Each Vessel	1 L	2 L	3 L	5 L	7 L	10 L	15 L
Rated Power [W], Each Vessel	400	600	800	900	900	1500	1500

Agitation Control

Motor	Maintenance-free, low noise servo motor						
Speed Range and Accuracy	5 - 1000 rpm, ± 0.5%						
Rated Power [W], Each Vessel	200	400	400	400	400	750	750

Gas Control

Gas Source	Air, O ₂
Control Method	· Air: rotameter · O ₂ : rotameter + solenoid valve
Gas Inlet	Ring sparger
Flow Range	Sparger - Air: Max. design 2 wvm Sparger - O ₂ : Max. design 1 wvm
Flow Accuracy	± 4%

Temperature Control

Control Method	Robust PID algorithm						
Heating Method	Closed loop system with circulating jacket, bottom electric hot plate						
Heating Power [W], Each Vessel	80	80	200	330	330	550	550
Cooling Method	Tap water or circulating cooling water						
Sensor	Pt100 RTD [JUMO, German]						
Measurement Range and Accuracy	0~150.0°C, ± 0.1°C						
Control Range and Accuracy	8.0 °C above coolant to 40.0 °C above ambient (0-65.0 °C absolute), ± 0.2°C						

pH Control

Control Method	· Robust PID algorithm · Cascade control with peristaltic pumps by adding acid and alkali
Sensor	Hamilton Sterilizable Gel-filled pH electrode
Measurement Range and Accuracy	2.00~12.00, 0.01
Control Accuracy	± 0.05

DO Control

Control Method	· Robust PID algorithm · Cascade control with different parameters [agitation, gas flow and pump]
Sensor	Hamilton Sterilizable polarographic DO electrode
Measurement Range and Accuracy	0.0~150.0%, 0.1%
Control Accuracy	± 3%

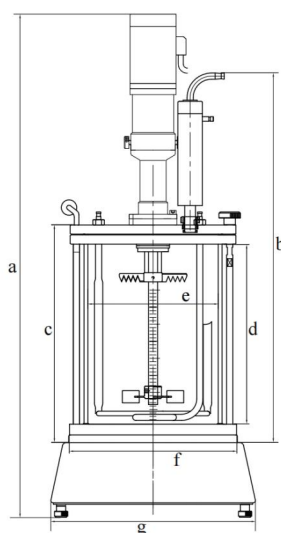
Foam Control

Control Method	· Cascade control with peristaltic pump by adding antifoam (defoamer)	· Mechanical defoaming blade
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Specification - Vessel

Glass Vessel

Type	Single-wall flat-bottom cylindrical vessel, available for heating base						
Total Volume [L]	1	2	3	5	7	10	15
Max. Working Volume [L]	0.75	1.50	2.25	3.75	5.25	7.50	11.25
Min. Working Volume [L]	0.25	0.50	0.75	1.25	1.75	2.50	3.75
Material [Wetted Part]	· Glass vessel material: Borosilicate 3.3 glass · Vessel cover and inner parts: SUS 316L · Seal: EPDM and Silicone						
Surface Treatment	· Inner surface: electrolytic polishing, Ra <0.4 µm · Outer surface: Ra <0.6 µm						
Pressure Design	Working pressure: 0~1 bar @ 150°C Autoclavable						
Height to Diameter Ratio [H: D]	Approx. 2:1						
Vessel Dimensions	Refer to "Table A"						
Vessel Weight [Excluding Motor] [kg]	8	10	11	13	15	17	20
Base Weight [With Bottle Holder] [kg]	8	8	10	10	10	15	15
Vessel Lid Interface	1 × Agitator flange for top mechanical stirring 1 × Flame inoculation port 2 × Baffle port, including cooling coil 1 × Gas inlet port for ring sparger 1 × Exhaust port, including water-cooled exhaust condenser 1 × Sampling port 1 × pH sensor port 1 × DO sensor port 1 × PT100 temperature sensor port 1 × Foam sensor port N × Feeding port						
Impellers	· < 5L: 2 layers, top: foam breaker, bottom: 6-blade Rushton impeller · 5L: 3 layers, top: foam breaker; middle: 4-blade pitched impeller; bottom: 6-blade Rushton impeller						
Baffles	· <3L: 2 removable baffles · 3L: 4 removable baffles						



* Table A

Dimension							
Vessel volume [L]	1	2	3	5	7	10	15
a [mm]	448	540	637	656	736	840	888
b [mm]	360	430	470	486	522	616	700
c [mm]	205	254	270	286	368	430	470
d [mm]	170	230	230	240	315	380	420
e [mm]	Ø90	Ø110	Ø140	Ø170	Ø170	Ø185	Ø216
f [mm]	156	156	187	220	220	240	275
g [mm]	210	210	248	267	267	300	340
Sterilization Requirement							
Minimum Size [mm]	Ø195x365	Ø195x450	Ø230x475	Ø270x500	Ø270x590	Ø275x645	Ø320x710
Recommended Size	Ø260x400	Ø260x500	Ø300x550	Ø330x550	Ø330x650	Ø330x650	Ø370x750

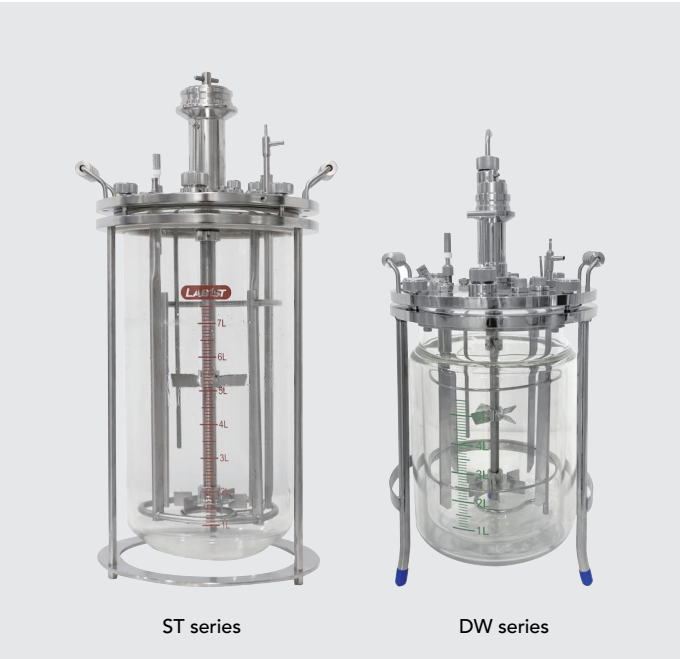
Options & Upgrades

Culture Vessel

Item	Description	Function
ST Series	Single-wall round-bottom cylindrical vessel, available for electric blanket	A variety of vessels to meet different needs
DW Series	Jacketed round-bottom cylindrical vessel, available for water jacket temperature control	

Impeller

Item	Description	Function
Type	Lift impeller, oblique leaf impeller, rotary filter, Marine impeller, Spin filter, packed-bed impeller, etc.	Flexible customization to meet different application requirements



Sensors

Item	Description	Function
pH Sensors	Hamilton® Arc smart pre-pressurized gel-filled sensor for real-time pH monitoring	Pre-calibrated, ready to use, automatic diagnostics
	Mettler Toledo Brand	More brand choices, adaptable to different systems
DO Sensors	Mettler Toledo Brand	More brand choices, adaptable to different systems
	Hamilton® optical dissolved oxygen sensor	No polarization required, quick start
More Sensors	Mettler Toledo Brand	More brand choices, adaptable to different systems
	Hamilton DCO2 sensor	Online real-time monitoring of carbon dioxide dissolved in liquids
	Hamilton VCD sensor	Online real-time monitoring of viable cell density
	Hamilton OD sensor	Online real-time monitoring of cell turbidity

More Options

Item	Description	Function
Control Cabinet	Stainless steel 304 housing material	More hygienic
HMI	Siemens	International recognition
Pump	Standard variable-speed pump	Supports more complex feeding procedures
	Watson Marlow 114 variable speed pump	International recognition
	Additional external pumps [up to 4 for twin-unit]	Support more in/out materials
Flow Meter	MFC, up to 4pcs for BR100-M2	Realize automatic control of gas flow with higher accuracy and calculate cumulative volume
Power Supply	110V ($\pm 10\%$), 60Hz, single phase	Adapt to voltage standards of different countries and regions
Wetted Part Material	2205 duplex stainless steel/titanium	Tolerant to high salinity environments
Aspect Ratio	1.5:1 2.5:1 3:1 Customizable	Flexible customization to meet different application requirements
Stirring Method	Top magnetic stirring Bottom magnetic stirring	Magnetic coupling further enhances sealing
Sparger Type	Microsparger	Smaller bubble size, stronger gas-liquid mass transfer efficiency
Adapter	Adapter for sensor height adjustment	Flexible positioning of sensor height to suit different vessel volumes
Sampling	Sterile sampling device	Consist of Luer head, one-way valve, T-joint, needle filter, and sterile syringe, suitable for sterile sampling.
Exhaust Gas Analysis	Exhaust gas analyzer for O ₂ and CO ₂	Online real-time detection of CO ₂ and O ₂ in exhaust gas, analysis of respiratory metabolic parameters CER/OUR/RQ
Exhaust Gas Heating	Exhaust heater	Heating the exhaust gas filter to avoid filter clogging
Weighing	Vessel weighing Feed weighing	Weight measurement for level control
Light	Red, blue and white, or customizable; Fixed or adjustable light intensity (0-100%)	Optimize light conditions to significantly enhance cell density and biomass yield of photosynthetic organisms
Qualification	IQ/OQ documentation	Meet compliance requirements
Certification	Comply with ASME BPE, UL and other certifications	Meet the certification requirements of different countries and regions

● MFC



● Watson Marlow Peristaltic Pump



● OHAUS Scales



● Sensor Height Adapter



● Red, Blue and White Light

