> *Modular Scalability*
> *Microbial Cultivation*
> *Precise Process Control*

BIOREACTOR

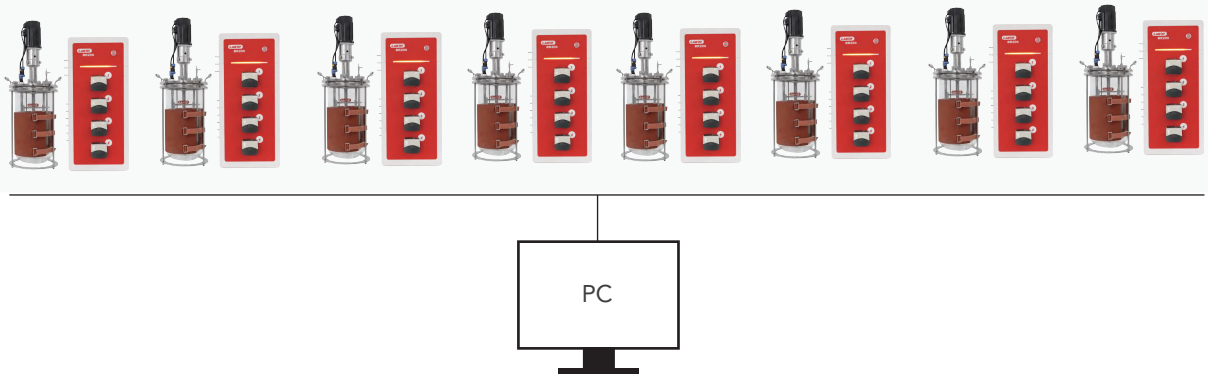
BR200-M Series

Labfirst Scientific Instruments (Shanghai) Co., Ltd. | www.lab1st.com | sales@lab1st.com

Advantages

SCADA Central Control

The SCADA system is expandable to control **up to 8 units** *for parallel production.*

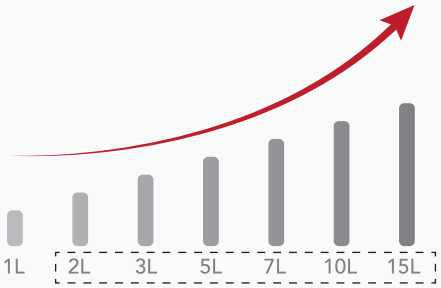


Dual-Vessel Control Mode

The primary control unit supports connection to a secondary controller via Ethernet communication, enabling 1-to-2 control configuration.

Flexible Vessel Switching

This single unit is compatible with culture vessels ranging from 2L to 15L and allows for easy changeover between them.



Two Operation Modes

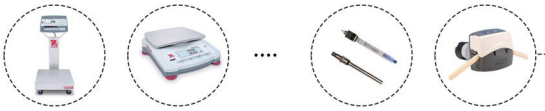
BR200-M offers two distinct control modes: direct touchscreen interaction via the 22" display and traditional data entry with a keyboard & mouse.

Mode 1

Mode 2

Smart Expansion Module

The BR200-EM8 Module delivers extensive expansion capabilities, supporting up to 8 peripheral devices such as sensors, balances, scales, peristaltic pumps, exhaust gas analyzers, etc.



Features

designed for 21CFR Part11™

- Design excellence: Premier solution for microbial cultivation.
- Versatile Vessel Volumes: 7 vessel sizes (1L, 2L, 3L, 5L, 7L, 10L and 15L) to suit diverse experimental needs.
- Powerful Scalability:
  > Interchangeable vessels support a wide range of volumes (2L-15L).
  > Modular expansion allows a primary control unit to control a secondary control unit for dual-vessel operation.
  > Centralized SCADA control can scale to manage up to 8 units for parallel production.
- Next-Gen Interface: 22" capacitive touchscreen with multi-touch support (including zoom and gloved operation) and an intuitive second-generation GUI for effortless control.
- Global Remote Access: Secure real-time monitoring via PC/mobile devices with worldwide connectivity.
- Real-Time Data Logging: Operational parameters, alarm events, and activity records are automatically logged in real time by the bioreactor, ensuring full traceability and data integrity throughout the process.
- Space-Efficient Architecture: Compact footprint with flexible touchscreen placement for optimal lab space utilization.
- Advanced Automation: Mass flow controllers (MFCs) replace rotameters for automated, quantified gas control and accelerated process development.
- Multi-Control Strategies: Feedback-, time-, condition-, and script-based control strategies.
- Optimized Vessel Engineering: Premium materials with modular construction for easy disassembly and maintenance.
- Reliable Precision Performance: Equipped with globally top-tier hardware components for superior control accuracy.
- Tri-color Status Lights: Red/Yellow/Green indicators for alarm/standby/operation status.
- Customizable Controller Color: Flexible exterior color options to match lab aesthetics or branding.
- User-Centric Interface: Parameters and control buttons are clearly separated, ensuring a clean, intuitive layout with functions immediately visible.

Specification

>>> Independent Control Tower

BR200-M Primary Control Tower	
Housing Material	Cold-rolled steel plate + white powder coating
Dimensions [WxDxH, mm]	240×535×560
Weight [kg]	Approx. 32 kg
Display I Operation	22-inch Elo projected capacitive touchscreen
Controller	Siemens S1200 series PLC, Weinview HMI
Integrated Pump	4 Watson Marlow 114 variable-speed peristaltic pumps
Flow Meter	2 MFCs
Communication	· 2 x USB · 1 x Industrial Ethernet · 1 x Internet · 1 x HDMI
Interface	· 1 x pH sensor cable · 1 x DO sensor cable · 2 x stirring motor control wires · 1 x temperature sensor interface · 1 x foam sensor cable · 1 x heating blanket control wire interface · 1 x main power interface
Water Interface	6× barb interface [inlet/outlet for exhaust condenser, cooling finger, chilled water]
Air Interface	2 × Push to Connect Fitting [Gas supply], 1 × barb [Mixing gas to vessel]
Power Supply	220V (±10%), 50Hz, single phase
Rated Power [W]	Max. 1.5 KW

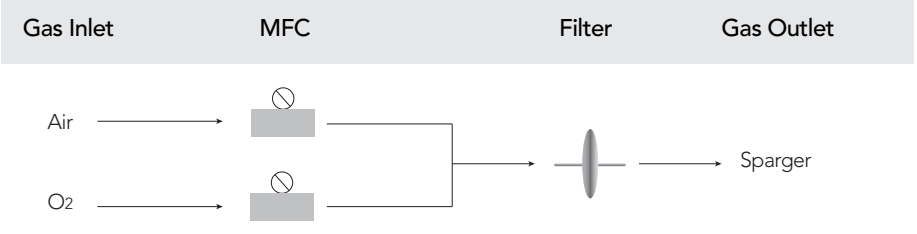
BR200-M Secondary Control Tower	
Housing Material	Cold rolled steel plate + white powder coating
Dimensions [WxDxH, mm]	240×535×560
Weight [kg]	23 kg
Display I Operation	N/A
Controller	Distributed I/O
Integrated Pump	4 Watson Marlow 114 variable-speed peristaltic pumps
Flow Meter	2 MFCs
Communication	· 2 x Industrial Ethernet · 1 x RS232
Interface	· 1 x pH sensor cable · 1 x DO sensor cable · 2 x stirring motor control wires · 1 x temperature sensor interface · 1 x foam sensor cable · 1 x heating blanket control wire interface · 1 x main power interface
Water Interface	6× barb interface [inlet/outlet for exhaust condenser, cooling finger, chilled water]
Air Interface	2 × Push to Connect Fitting [Gas supply], 1 × barb [Mixing gas to vessel]
Power Supply	220V (±10%), 50Hz, single phase
Rated Power [W]	Max. 1.5 KW

Note: The standard BR200-M series bioreactor system includes only the primary control unit. The secondary control unit is available as an optional upgrade feature.

>>> Control Capacity

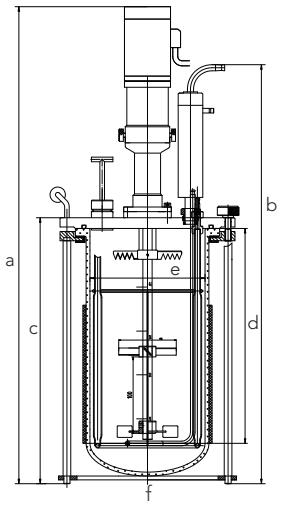
Agitation Control	
Motor	Maintenance-free, low noise servo motor
Speed Range and Accuracy	5 - 1000 rpm, ± 0.5%
Rated Power [W]	1L: 100 W, 2-7L: 400 W, 10-15L: 750 W
Gas Control *	
Gas Source	Air, O_2
Control Method	2 x MFCs
Gas Supply	Ring sparger
Flow Range	Sparger Air, O_2: up to 20 L/min
Flow Accuracy	1%
Temperature Control	
Control Method	Robust PID algorithm
Heating Method	Electric blanket heating [additional]
Cooling Method	Tap water or circulating cooling water [additional chiller]
Sensor	Germany JUMO Pt100 RTD
Measurement Range and Accuracy	0~150.0℃, ± 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 peristaltic 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 · Mechanical defoaming blade

*** Gassing Strategy Diagram**



>>> Glass Vessel

ST Series							
Type	Single-wall round-bottom cylindrical vessel, available for electric blanket						
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 for ST series"						
Vessel Weight [Excluding Motor] [kg]	8	9	10	12	13.5	15	18
Vessel Lid Interface	1 × Agitator flange 1 × 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						
Sealing Type	Top mechanical stirring						
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 · Detachable, height adjustable, various type						
Baffles	· <3L: 2 removable baffles · 3L: 4 removable baffles						



* Table A - ST Series vessel

Dimension							
Vessel Volume [L]	1	2	3	5	7	10	15
a [mm]	450	471	567	622	712	753	851
b [mm]	430	450	492	546	636	641	738
c [mm]	227	214	292	347	437	442	484
d [mm]	170	190	230	280	370	360	450
e [mm]	Ø90	Ø110	Ø130	Ø150	Ø160	Ø185	Ø203
f [mm]	180	190	190	212	212	248	270
Sterilization Requirement							
Minimum Size [mm]	Ø220x450	Ø230x470	Ø230x500	Ø265x550	Ø265x640	Ø300x645	Ø335x740
Recommended Size [mm]	Ø280x500	Ø280x500	Ø280x550	Ø300x600	Ø300x700	Ø350x700	Ø380x800

Options & Upgrades

Item	Description	Function
Culture Vessel	DW Series: Double-wall round-bottom cylindrical vessel + water jacket temperature control	A variety of vessels to meet different needs
Impeller	Lift impeller, oblique leaf impeller, rotary filter, Marine impeller, packed-bed impeller, etc.	Flexible customization to meet different application requirements

DW Culture Vessel

Lift Impeller

Oblique Leaf Impeller

Rotary Impeller

Marine Impeller

Packed Bed Impeller

Hollow Blade Impeller

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 Sensors

Item	Description	Function
Control Cabinet	Stainless steel 304 housing material	More hygienic
HMI	Siemens	International recognition
Pump	Additional external pumps	Support more in/out materials
Gas	Nitrogen, Methane, etc.	Enables automated flow regulation and precise measurement for specialized application requirements
Communication	SCADA	Integrate systems for powerful real-time monitoring and data analysis
Power Supply	110V (± 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	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
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

Expandable Pump

OHAUS Electronic Scale

OHAUS Scales

Red, Blue And White Light

Sensor Height Adapter

Labfirst Scientific Instruments (Shanghai) Co., Ltd.

Website: www.lab1st.com
Online Store: eshop@lab1st.com
Email: sales@lab1st.com
Phone: 844-452-2178