Benchtop Bioreactor System

BR100Pro Series

Labfirst Scientific Instruments (Shanghai) Co., Ltd.

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BR100Pro bioreactor is your go-to solution for cultivating a wide range of organisms — bacteria, yeast, and animal cells — under precisely controlled conditions. This versatile bioreactor is an essential tool across various industries, from pharmaceuticals and biofuels to food production and environmental management.

Designed to meet validated lab research requirements, BR100PRro bench-scale bioreactor features a 15.6-inch industrial HMI for easy operation. The system ensures stable and reliable performance with the integration of high precision feeding pumps (Watson Marlow variable speed pump head) and gas inlets controlled by flowmeter and TMFC.

> Interchangeable single or twin culture vessel: 3 L to 15 L
> Built-in Watson Marlow variable-speed peristaltic pumps
> 15.6-inch industrial resistive touchscreen
> Precision control with MFC (mass flow controller)
> Culture vessel with electric blanket
> Application for cell culture (BR100Pro-C1/C2) and microbial fermentation (BR100Pro-M1/M2)

Key Benefits

- Ideal for lab upgrades: high-precision control, accuracy, and scalability.
- User-friendly HMI, concise design, simplified operation
- 4 options: Interchangeable single or twin set up, applied to microbial fermentation or cell culture
  Standardized modular machine ensures flexible configuration options while ensuring fast lead time
- Complies with the requirements of a validated GMP environment

Service

30+ Years Experience

Onsite Installation and Training

Complete Production and Inspection Process

Customization Capability

Elevate Your Research with BR100Pro Bioreactor

The BR100Pro benchtop bioreactor is designed for both cell culture and microbial fermentation, offering precise control over environmental conditions. It supports the growth of mammalian cells for biologics production and facilitates microbial fermentation for biofuels and other products, ensuring consistent and scalable results in research and industrial applications.

BR100Pro-M1 Series
Single veseel configuration

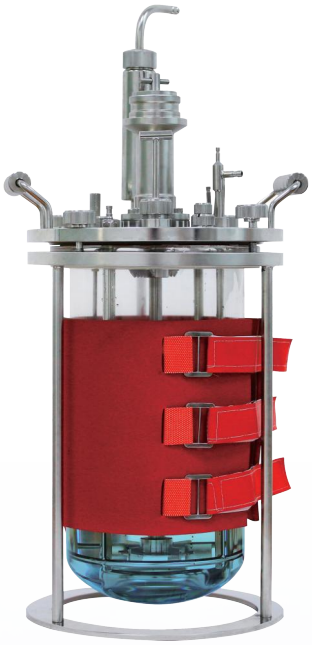
BR100Pro-M2 Series
Twin veseel configuration

BR100Pro-C1 Series
Single veseel configuration

BR100Pro-C2 Series
Twin veseel configuration

M: Microbial fermentation application
C: Cell culture application

Mature Culture Vessel Design



> Material: SUS316L stainless steel, high-quality borosilicate glass, EPDM/silicone seals, reliable airtightness, clean and hygienic design

> Round shaped bottom of the stand provides a maximum of sturdiness to the vessel

Exhaust condenser

> Condensation and recovery of moisture and volatile substances in tail gas; prevents filter clogging

Heating blanket for uniform heat

> The heating blanket can be easily wrapped around vessel and secured tightly by hook and connectors for optimal heat transfer. Adopting foamed silicone, it has good heat dissipation and achieves uniform heating

Functional cover with handles

> Complete tank cover interface configuration, rich and flexible functional ports to meet different process requirements

> Additional, integrated handles make it more ergonomic and easier to carry

Control Tower with Software

Powerful Hardware Configuration

> 15.6-inch industrial resistive touchscreen, easy-to-use and reliable operation even while wearing laboratory gloves
> A full set of Hamiltion / Metteler sensors with high precision, supporting repeated sterilization, and facilitating process development and optimization
> Servo Motors: High-precision, maintenance-free, low-noise servo motors for long-term stable operation
> High precision Watson Marlow variable-speed peristaltic pumps for fast tubing installations
> Pricision control with one MFC (mass flow controller)
> Quick-connect couplings make it easy to attach all cables and supplies to the culture vessels
> All inlets and ports for cooling water, process gases, electricity, Ethernet, and potential-free alarm contacts are located on the side panel of the control tower

Side view of the controller

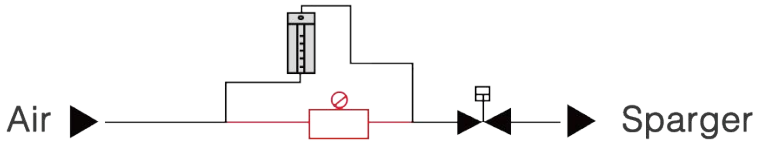
Complete Software Functions

> Siemens PLC controller, stable, reliable and easy to maintain
> Different software versions, corresponding to C and M series, corresponding to cell culture and fermentation applications
> Measurement and control opportunities of pH, DO, temperature, foam, feed, gas mixing, agitation, harvest and constant total gas flow control, etc.
> Control capacities: Manual/automatic control, PID control, cascade control, step control, custom recipe setting
> Real-time online monitoring, data recording, curve display of various parameters;
> Automatic storage of operation records, traceability of experimental process,etc.;
> 3-level password protection ensures data security;
> USB (software updates, serial communication), Ethernet (IP Network)
> With 1 analogue input, 4~20mA

Gassing Strategy

Airflow

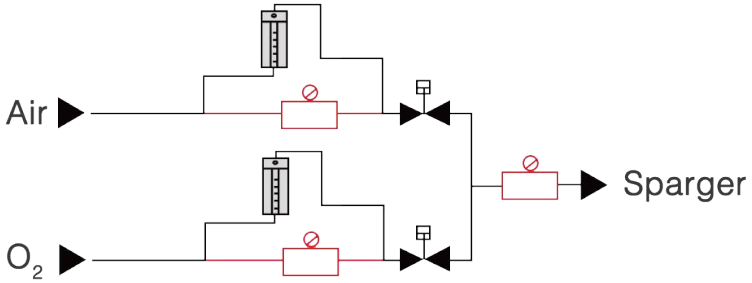
Utilizing one air flow path, the flow meter intuitively indicates and controls sparger flow rate. An optional mass flow controller can be integrated to control and measure the flow range by manual regulation or automatically in combination with a DO controller.



O_2-Enrichment

Utilizing two flow paths for air and O_2 flow, the flow meter intuitively indicates and allows manual adjustment of the sparger flow rate. O_2 is pulsed through a solenoid valve and flows only as needed to maintain the Dissolved Oxygen (DO) set point. No air is provided at this time. A mass flow controller can be integrated to measure and control the total gas flow range by manual adjustment or automatically combined with a DO controller.

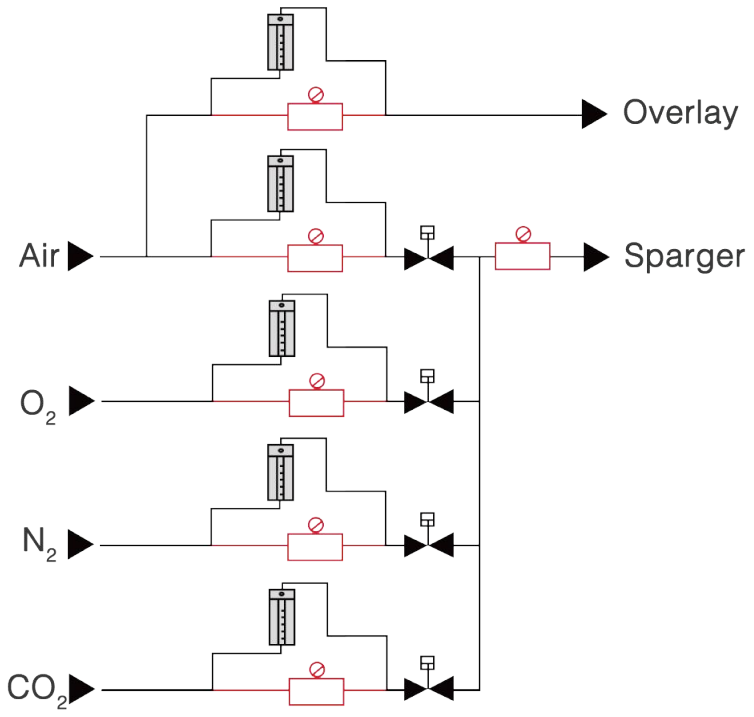
- Sparger - Air: Max. design 2 vvm
- Sparger - O_2: Max. design 1 vvm



Additive Flow

Simultaneous gassing strategy of overlay and sparger: air goes into overlay through a flow meter and a solenoid valve. Solenoid valves select air, O_2, N_2 and CO_2 to flow to the sparger. An additional airflow path can be added to the distributor. Mass flowmeter is optional for each gas inlet.

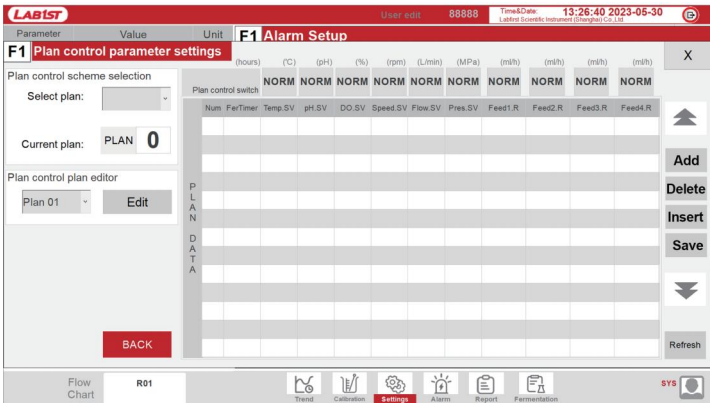
- Overlay - Air: Max. design 1 vvm
- Sparger - Air: Max. design 0.2 vvm
- Sparger - O_2: Max. design 0.2 vvm
- Sparger - N_2: Max. design 0.2 vvm
- Sparger - CO_2: Max. design 0.2 vvm
- Rotameter accuracy: ± 4%
- MFC accuracy: ± 1% [Upgradable ± 0.5%]



Advanced Software Making it Easier

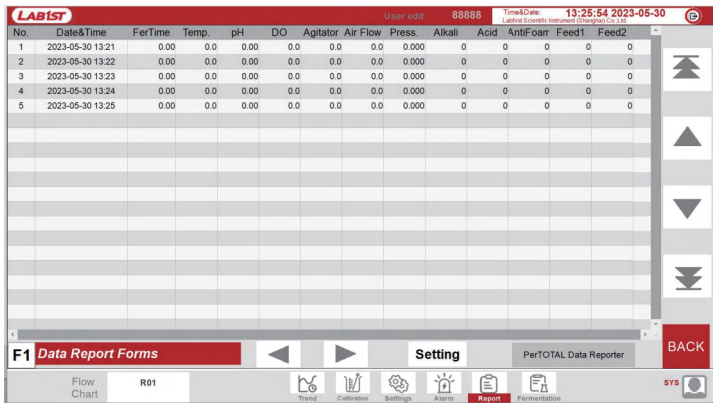
Fermentation

- Set and describe your fermentation batches and plans
- Display and export fermentation data



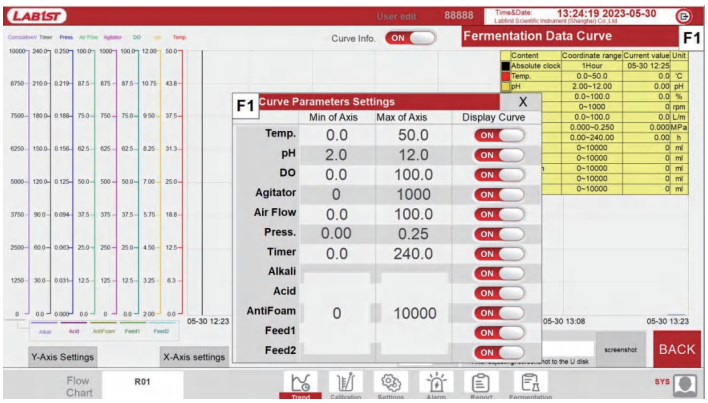
Report

- History display and controller overview
- Easy external data storage on every USB device as an Excel or PDF document.



Trend

- Real time multiple curves display.
- Different curves can be displayed in turn if necessary.
- Screen display can be zoomed in and out.

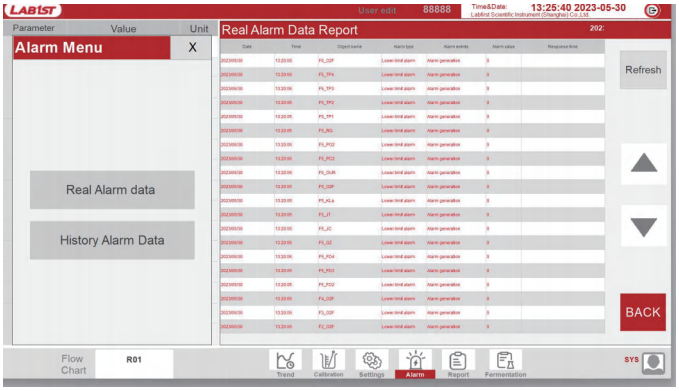


Setting

- Make definition quickly for peristaltic pumps
- Easily set your own system configurations and fermentation procedures.

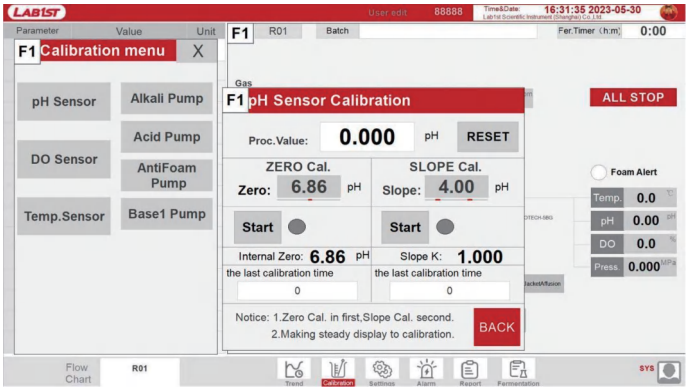
Alarm

- Clearly display current and historical alarm information.
- All alarm issues can be recorded and consulted.



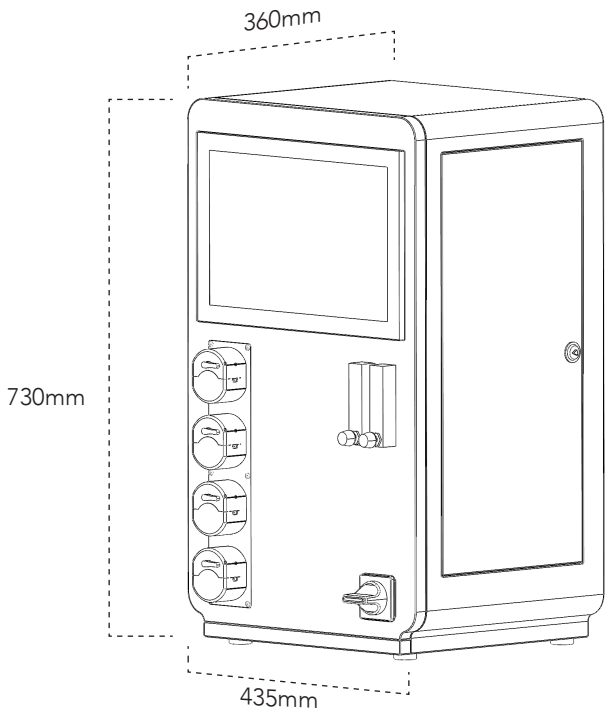
Calibration

- Accurately calibrate PH, DO and PT100 sensors
- Make calibration procedures for peristaltic pumps



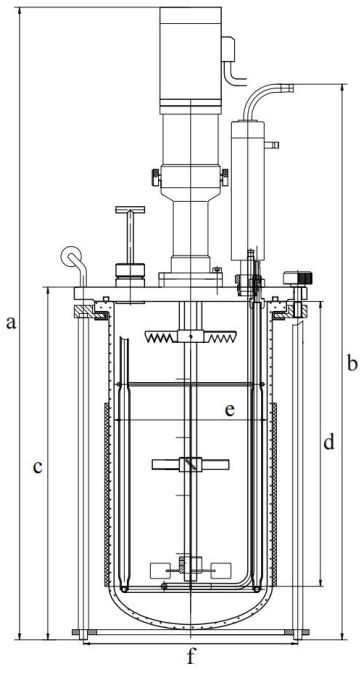
Specification - Control Tower

Model					
Culture vessel capacity	3 L	5 L	7 L	10 L	15 L
M: Microbial fermentation	BR100Pro-M1-3L	BR100Pro-M1-5L	BR100Pro-M1-7L	BR100Pro-M1-10L	BR100Pro-M1-15L
C: Cell culture	BR100Pro-C1-3L	BR100Pro-C1-5L	BR100Pro-C1-7L	BR100Pro-C1-10L	BR100Pro-C1-15L
Independent Control Tower					
Housing Material	SUS304 stainless steel [optional carbon steel + plastic powder coating]				
Dimensions [WxDxH, mm]	435×360×730				
Weight [kg]	Approx. 40 Kg [depending on configuration				
Controller	HMI, Siemens S series PLC				
Display I Operation	15.6" color touch screen				
Integrated pump	4 Variable-speed Waston-Marlow 114 peristaltic pumps, controlled				
Flow meter	2 rotameters + 1 MFC [Vogtlin] Upgradable to 5 MFCs, Burkert or Alicat available				
Communication	· 1 x USB [software upgrade, data copy and export] · 1 x Industrial Ethernet [upgradeable SCADA communication] · 1 x Analog Input 4 to 20 mA				
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 Electric blanket control wire interface · 1 x main power interface				
Water interface	6×Ø8 mm pagoda interface [inlet/outlet for exhaust condenser, cooling finger, total water]				
Air interface	M Series: 3×Ø8 mm pagoda [2 x gas source interface, 1 x vessel gas outlet] C Series: 6×Ø8 mm pagoda [4 x gas source interface, 2 x vessel gas outlet]				
Power supply	220V (±10%), 50Hz, single phase [optional 110V [± 10%], 60Hz, single phase]				



Specification - Culture Vessel

Culture Vessel					
Material [wetted part]	Glass vessel material: Boro 3.3 high borosilicate glass				
	Lid and inner parts: SUS 316L				
	Sealing ring: EPDM (FDA approved]				
Type	Single wall round bottom cylindrical tank, electric blanket heating				
Surface treatment	Inner surface: Ra ＜0.4 μm				
	Outer surface: Ra ＜0.6 μm				
Pressure design	Working Pressure: 0~1 bar @ 150℃				
	Autoclavable				
Total volume of tank [L]	3	5	7	10	15
Maximum working volume [75%] [L]	2.25	3.75	5.25	7.50	11.25
Minimum working volume [25%] [L]	0.75	1.25	1.75	2.50	3.75
Height-to-diameter ratio [H:D]	Approx. 2: 1 [option 1.5:1 | 2.5:1 | 3: 1]				
Tank dimensions	Refer to "Table A"				
Tank weight [without motor] [kg]	10	12	13.5	15	18
Tank cover interface	1 × Agitator flange				
	1 × Flame inoculation port				
	2 × Baffle port, including cooling coil				
	1 × Gas inlet port				
	1 × Exhaust port				
	1 × Sampling port				
	1 × PH sensor port				
	1 × DO sensor port				
	1 × PT100 temperature sensor port				
	1 × Foam sensor port				
	* × Feeding port				
	1 × Overlay port for BR100Pro-C Series				



* Table A

Dimension					
Vessel volume [L]	3	5	7	10	15
a [mm]	567	622	712	753	851
b [mm]	492	546	636	641	738
c [mm]	292	347	437	442	484
d [mm]	230	280	370	360	450
e [mm]	Ø130	Ø150	Ø160	Ø185	Ø203
f [mm]	182	212	212	248	270
g [mm]	-	-	-	-	-
Sterilization requirement					
Minimum size [mm]	Ø230x500	Ø265x550	Ø265x640	Ø300x645	Ø335x740
Recommended size	Ø280x550	Ø300x600	Ø300x700	Ø350x700	Ø380x800

Specification - Control Capacity

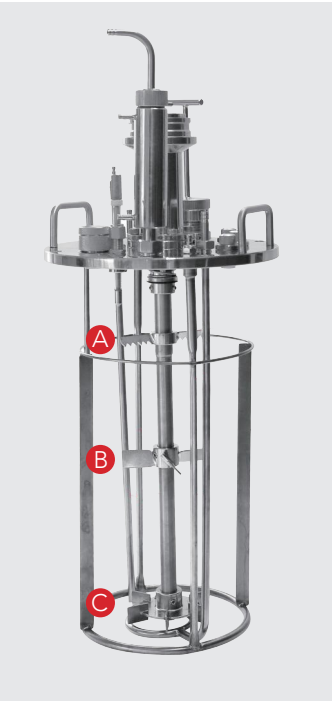
Agitation Control	
Motor	Maintenance-free, low noise servo motor
Drive	Top mechanical stirring [option: top magnetic stirring]
Speed range and accuracy	5 - 1000 rpm, ± 0.5%
Impellers	Detachable, height adjustable, type rich [consult LAB1ST sales]
	M Series [< 5 L]: 2 layers, top: foam breaker, bottom: 6-blade Rushton impeller
	M Series [≥ 5 L]: 3 layers, top: foam breaker, middle: 4-blade pitched impeller, bottom: 6-blade Rushton impeller
	C Series: 2 layers, top: foam breaker, bottom: 3-blade elephant-ear impeller
Impeller diameter to vessel diameter ratio	M Series: 0.4
	C Series: 0.5
Baffle	4 x removable baffles

Temperature Control	
Control method	Robust PID algorithm
Heating method	Electric blanket heating
Heating power [W]	
Cooling method	Tap water or circulating cooling water
Sensor	Pt100 RTD
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
	M Series: Cascade control with peristaltic pumps by adding acid and alkali
	C Series: Cascade control with peristaltic pump by adding alkali and solenoid valve by adding CO2
Sensor	Hamilton Sterilizable Gel-filled pH electrode [option: Mettler]
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 [option: Optics, Mettler]**
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

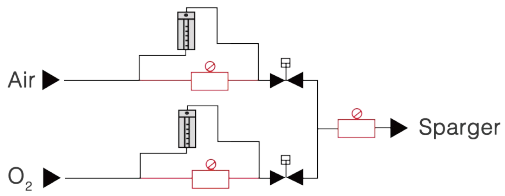


A: Foam breaker
B: 4-blade pitched impeller
C: 6-blade Rushton impeller
D:Elephant-ear impeller

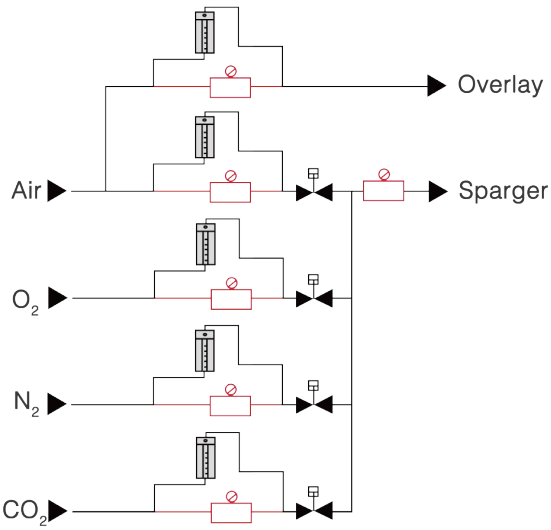
Specification - Control Capacity

Gas Control	
Gas type	M Series: air, O2
	C Series: air, O2, N2, CO2
Control method	Air [overlay, sparger]: rotameter
	Air, O2, N2, CO2: 1 x TMC, Solenoid valve
Gas supply	M Series: Ring sparger
	C Series: Overlay for Air + Ring sparger [oprion: microsparger]
Flow range and accuracy	M Series:
	Overlay - Air: Max. design 2 vvm
	Sparger - O2: Max. design 1 vvm
	C Series:
	Overlay - Air: Max. design 1 vvm
	Sparger - Air: Max. design 0.2 vvm
	Sparger - O2: Max. design 0.2 vvm
	Sparger - N2: Max. design 0.2 vvm
	Sparger - CO2: Max. design 0.2 vvm
	Rotameter accuracy: ± 4%
	MFC accuracy: ± 1% [Upgradable ± 0.5%]
Exhaust	Exhaust condenser
Filtration	2 x Satorius 0.2 μm PTFE filter [inlet and exhaust]

O_2-Enrichment



Additive Flow



Quality and Documentation

Strict quality control process, like Tank flaw X-ray detection, air tightness testing, sensors testing, sterilization procedure test...Furthermore, we also have relevant patents and provide related documents like, IQ, OQ, PQ, SAT, FAT...

Documentation Available

Material Certificate
Production Control Table
Welding Record
Pressure Testing Report
Operation Manual
Equipment Outline Chart
P&ID Chart
Layout
Electrical Loop Chart
Ra Testing Report
.....

General Test Listing

Calibration confirmation of instrumentation
Document/drawing confirmation
Confirmation of PID
Confirmation of key components
Inspection and confirmation of electrical schematic diagram
Spray ball coverage test
System air tightness test
Human-machine interface confirmation
Inspection of the operation of the fermenter system
Confirmation of level 3 authority
Alarm function confirmation
Data recording and backup confirmation
Temperature control testing
Testing of stiring system controls
Testing for pH control
Testing for DO control
Power outage and restoration testing
Ports testing
Audit trail functional confirmation
Sterilization procedure test

Extensive Customization Options for Your Bioreaction Research

- Analysis or Control: OUR, CER, KLa, RQ, ORP, methanol, exhaust gas (O2, CO2), glucose, etc.
- Gas Supply Control: Up to 5 MFCs (Vogtlin), optional burkert or Alicat brands
- Scale: Tank weight / replenishing
- Light: Light source can be selected from red, blue, and white. Its intensity is adjustable [0-100%]
- Remote Function: Option to upgrade remote monitoring and screen mirroring;
- Realize remote software upgrade

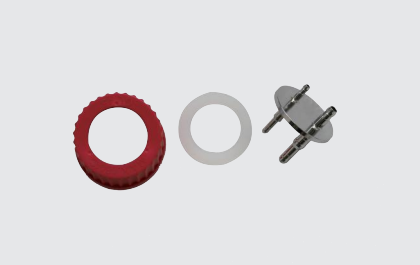
- Vessel Type: Jacketed round bottom cylindrical tank + water jacket temperature control
- Drive: Top magnetic drive
- Height-to-diameter ratio: 1.5:1 | 2.5:1 | 3:1
- Aeration Microsparger
- Material Carbon steel + plastic powder coating
- Blades: Customizable blades from different options (Spin filter, Cell-lift

- Communication: SCADA
- Power: 110V (± 10%), 60Hz, single phase
- pH electrode: Mettler Toledo brand
- DO electrode: Mettler Toledo brand, optical electrode
- Peristaltic pump More peristaltic pumps for different functions

Main Accessories

PH Sensor Electrode adapter

Bottle



Bottle Accessories

Threaded Pagoda

PH buffer powder

Cable ties

Silicone tube [25#]

Silicone tube [D7]

PVC braided hose

Silicone tube [16#]

DO sensor

PH Sensor

Touch pen

Telfon tape

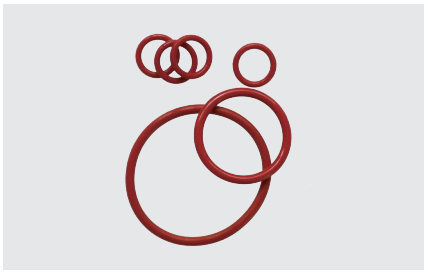
Key

Main Accessories


Sterilization cover [motor]


Inoculating loop


Silicone plug


O-ring

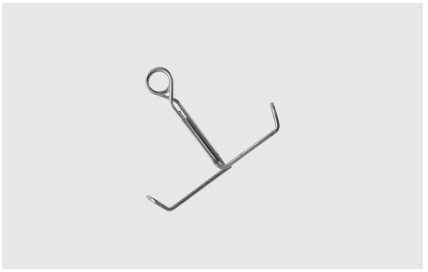

Adjustable hose clamps


Fuse

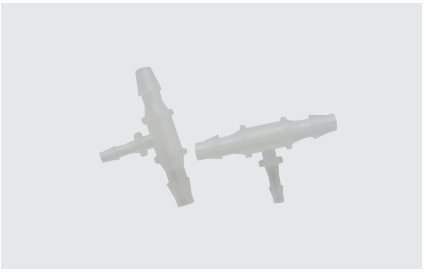

Set screw+Allen wrench


Feeding needle


Power cord


Spring water stop


Gas filters


Pagoda tee [plastic]


Sodium sulfite powder


Spiral water stop


Tee connector

Rated Products

Multi-parallel bioreactors

Comparing cultures in single vessel, multi-parallel bioreactors allow you to find out more process information in a shorter timeline. Multiple experiments can be set up to evaluate different culture strains and the effect of process parameters, such as temperature, feeding, DO, gassing rates and so on.

Chiller

DC series heating cooling circulator is an open table type circulator with compact structure and small footprint. Its temperature range is -5C - 95C. The water/oil bath design is suitable for both internal and external applications.

Air compressor

LAB1ST air compressor's flow rates are from 1.1 to 34 CFM and a max working pressure of 116 PSI. It has safety valve for sensitive detection and constant overpressure unloading function. It's with LED display screen and fully automatic microprocessor control.

Autoclave

LAB1ST autoclave uses steam under pressure to kill harmful bacteria, viruses, fungi, and spores on items that are placed inside a pressure vessel. It's available with different working volume from 15L to 300L. The temperature and pressure range is 50℃-126℃, 1.42bar or 50℃-126℃, 1.42bar (option).

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