brs
BIOTECHNOLOGY
EQUIPMENT

AUTOCLAVABLE LABORATORY FERMENTER AND BIOREACTOR BRS BIOTECH

Laboratory fermenters and bioreactors

BRS autoclavable lab fermentors and bioreactors are designed for research applications and fermentation process optimization.

Features

• Volumes ranging from 1 to 10 l.

• Fermentors and bioreactors are table- mounted and easy in maintenance and operation. Accessible connections for water and air minimize time and work requirements while starting operation.

• Power source, measurement and control tools are in separate cabinet and detached from fermenters and bioreactors. Each measurement and control circuit have individual module, which gives easy access for maintenance and a possibility for customization.

• We follow and adhere to the guidelines as set forth for cGMP and GAMP where requested.

Application

• Batch and continuous cultivation of bacteria, fungi and yeasts.

• Plant and animal cells cultivation.

• Small-scale production of proteins and mAb.

• Process design and other applications for research centers.

Total volume	Nominal working volume	Microbial cultivation	Cell culture cultivation	
			A. Single wall vessel	B. Double wall
1 L	0,7 L	✓	✓	✓
3 L	2,1 L	✓	✓	✓
5 L	3,5 L	✓	✓	✓
7 L	4,9 L	✓	✓	✓
10 L	7 L	✓	✓	✓

Other volumes and volumes below 1 L upon customer request

Technical specification

1. Vessel	Microbial	Cell
Vessel design pressure: 1 bar	✓	✓
Operating temperature range: room temperature + 8 °C to +60 °C	✓	✓
Vessel wall type	Single wall	A. Single wall B. Double wall
Vessel material: borosilicate glass 3.3	✓	✓
Lid material: stainless steel 316	✓	✓

2. Aeration system	Microbial	Cell
Air supply line with MFC, rotameter and electromagnetic valve	✓	✓
N2 gas supply line with MFC, rotameter and electromagnetic valve	Extra option	Extra option
O2 gas supply line with MFC, rotameter and electromagnetic valve	Extra option	Extra option
CO2 gas supply line with MFC, rotameter and electromagnetic valve	Extra option	Extra option
Sparger type	Ring sparger	Sinter sparger (microbubble)
Exhaust gas condenser	✓	✓
Sterile inlet gas and exhaust gas filter	✓	✓
Overlay gas supply	Extra option	Extra option

3. Agitation	Microbial	Cell
Agitation speed: 40-1000 rpm	✓	✓
Speed increase to 1500 rpm	Extra option	Extra option
Frequency converter	✓	✓
Sealing system: magnetic seal	✓	✓
Mechanical defoaming blade on the shaft	✓	✓
Impeller type	Rushton type	Propeller type
	(marine impeller, pitched blade, customized impeller upon request)	

4. Temperature control	Microbial	Cell
Heating and cooling: (temperature sensor, valves, PID control)	Heating element at the base of the vessel, cooling with water through a jacket at the base	A. Single wall vessel: Heating through electrical blanket, cooling though cooling finger B. Double wall vessel: Circulation circuit with pump and expansion tank, electric heating element
Heating blanket:	Extra option	✓

5. PH control	Microbial	Cell
Sterilizable PH sensor Range of display and automatic adjustment: 2.00 ~ 12.00 ± 0.05, 0 ~ 14.00 (depends on the sensor)	✓	✓
1 peristaltic pump for acid addition, 1 peristaltic pump for alcali addition, automatic mode of maintaining of the set pH level	✓	✓
pH control via CO2 supply	Extra option	Extra option

6. Defoaming control	Microbial	Cell
Defoaming sensor:	✓	✓
Peristaltic pump for defoaming solution dosing:	✓	✓

7. DO control	Microbial	Cell
Sterilizable digital optical DO sensor Range of display of DO sensor: 0-150±3%	✓	✓
A cascade automatic control through change of stirrer speed, air flow in the vessel	✓	✓

8. Peristaltic pumps	Microbial	Cell
4 peristaltic pumps Watson Marlow with fixed speed in total:		
Alkali pump	✓	✓
Acid pump	✓	✓
Defoaming pump	✓	✓
Feeding pump	✓	✓
Extra pumps with fixed speed and variable speed	Extra option	Extra option

9. Sampling system	Microbial	Cell
Integrated autoclavable sampling system	✓	✓

10. Ports	Microbial	Cell
Temperature sensor port	✓	✓
pH sensor port PG 13.5	✓	✓
pO2 sensor port PG 13.5	✓	✓
Defoaming sensor port	✓	✓
Feeding port – 4 needles ports (depends on the number of peristaltic pump)	✓	✓
Exhaust gas port	✓	✓
Sampling tube port	✓	✓
Air sparger port	✓	✓
Inoculation port	✓	✓

The configuration of the ports depends on the selected options

11. Main functions of basic control program BRS B

- 3 different access levels
- Parameters settings
- Status display of each actuator (valves, circulation pump, flowmeters, etc.)
- Temperature trend display
- pH, DO, agitator speed, gas supply flow rate (depending on the number of flow meters) trend display and data excel table.
- Data exportation via USB or CD card (Data on the main parameters) in Excel
- Remote operator's workstation with a personal computer (extra option)
- DO cascade control setting
- Setting and control of agitator speed and gas supply rate
- Warning and alarm settings and messages record
- Fermentation sequences compatible format
- Calibration

the number of functions in the program) depend on the configuration of the fermenter

Extra options

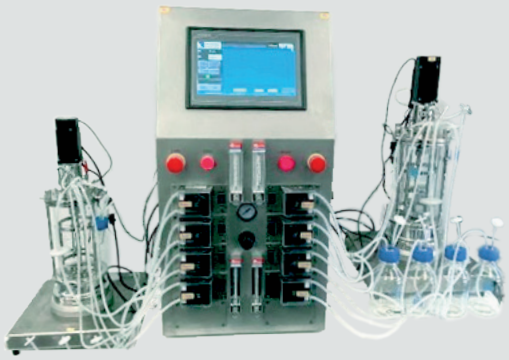
No	Option
1.	N2 gas supply line with MFC, rotameter and electromagnetic valve
2.	O2 gas supply line with MFC, rotameter and electromagnetic valve
3.	CO2 gas supply line with MFC, rotameter and electromagnetic valve
4.	Gas mixing unit up to 4 gases
5.	Overlay gas supply
6.	Extra pump with fixed speed
7.	Extra pump with variable speed
8.	Replacement fixed speed pumps with variable speed pumps
9.	Additional impeller package (types of impellers depend on customer requirements)
10.	pH control via CO2 supply
11.	Redox sensor
12.	Exhaust gas analyser of CO2
13.	Vessel weight measurement – level control
14.	Scale for nutrient weight
15.	Optical density sensor
16.	Living cell concentration monitoring sensor Hamilton
17.	Remote operator's workstation with a personal computer

Other options upon customer request

Parallel cultivation systems

Several fermenters integrated a single cultivation system on one platform – two vessels or more with a single control unit

Cell culture cultivation



Microbial cultivation

We produce also these types of fermenters:

Photobioreactos

Solid-phase fermenters

Airlift fermenters

Fermentors& Bioreactors/Downstream Processing Equipment
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