

BIOREACTORS FERMENTORS



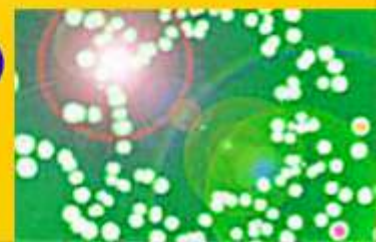
Glass Vessel Fermentors (Autoclavable)

Glass Vessel Fermentor (Insitu Sterilization)

Lab Scale Fermentors (SS-Insitu Sterilization)

Pilot and Process Scale Fermentors (SS-Insitu Sterilization)

Photobioreactor (Autoclavable)



Bioreactors and Fermentors

We provide Bioreactors / Fermenters for Bacteria, Fungus and Cell-Culture Application and Up and Down-Stream Equipment. Custom made mobile or stationary sterile tanks which are used in the media and product preparation. We can also help customers with maintenance, modernizing and product-specific adaptation of older Bioreactors and Fermentation plants.

For successful fermentation, it is important to have stringent monitoring conditions such as temperature, dissolved oxygen, pH and foam. Our knowledge brings you bioreactors; fermentor and cell culture system to offer microbiologists tailor made solutions for the best possible growth and biosynthesis. The fermentors and bioreactors are designed and fabricated keeping both usage and operational convenience in mind. Made of glass or stainless steel, of different capacities (suitable for tabletop and floor mounting) the system can be offered with, or without computer control. The systems offered are modular and can be easily upgraded with additional accessories for animal cell and plant cell culture and also other special fermentation application.

System Features

- Open frame system
- Automatic operation
- Well-designed system for Indian conditions
- Microprocessor based PLC control/ independent control system
- Insitu or autoclavable system
- Auto or manual sterilization facility
- Vessel SS 316 or glass
- User-friendly software
- pH/DO/Foam control
- pO₂ / redox controller and monitoring
- Cascade / multiple control facility
- Data logging facility
- Provision for scaling up from lab scale to pilot and process scale
- Top motor drive or bottom magnetic drives with mechanical seal
- Temperature control system
- Automatic/manual sample feed facility

Glass Vessel Fermentors (Autoclavable)

- Sterilized in autoclave
- Easy to watch the change of culture medium
- PID with pulse-width modulation of heater in water bath & cooling water
- Four pumps for feeding, acid, alkali and anti-foam
- Direct driven with high torque motor
- ABCS-II controller, based on windows xp, with powerful system and easy to operate



Specification

Model	LBR 100 A	LBR 100 B	LBR 100 C	LBR 100 D
Capacity (L)	3	5	7	10
Vessel	Borosilicate glass			
Material of Cover	SUS316L stainless steel			
Working Volume	60%~70%			
Sterilization	Autoclave			
Temperature	Temperature of cooling media + 5°C~60°C±0.2°C			
pH	2.00~12.00±0.05pH			
DO	0-150 ±3% digital display in 0.1% increment			
Antifoam	PID ON/OFF control with a pump			
Feeding	On/off control			
Air Flow Rate	Manual			
Agitation	50-1000rpm ±5rpm			
Seal	Single / Double mechanical seal			
Control System	ABCS-II			
Catalog No.	44540101	44540102	44540103	44540104

Accessories

Autoclave	Different capacity
Air Compressor	10L/min, 0.2~0.4MPa
Cooling Water	Tap water or others clean water
Drain	Not more than 2 meters from the fermentor

Glass Vessel Fermentors (Insitu Sterilization)

- Steam generator supply steam
- Upside wall: Borosilicate glass
- Lower side wall: stainless steel
- Stainless steel jacket
- Direct driven with high torque motor
- Four pumps for feeding, acid, alkali & anti foam
- ABCS-II control system



Specification

Model	LBR 200 A	LBR 200 B	LBR 200 C
Capacity (L)	5	7	15
Vessel	Borosilicate glass		
Material of Cover	SUS316L stainless steel		
Working Volume	60%~70%		
Sterilization	Insitu		
Temperature	Temperature of cooling media + 5°C~60°C±0.2°C		
pH	2.00~12.00±0.05pH		
DO	0-150 ±3%, digital display in 0.1% increment		
Antifoam	PID ON/OFF control with a pump		
Feeding	On/off control		
Air Flow Rate	Manual		
Agitation	50-1000rpm ±5rpm		
Seal	Single mechanical seal		
Control System	ABCS II		
Catalog No.	44540201	44540202	44540203

Accessories

Steam Generator	Inbuilt / external
Air Compressor	10L/min, 0.2~0.4MPa
Cooling Water	Tap water or others clean water
Drain	Not more than 2 meters from the fermentor

Lab Scale Fermentors (SS-Insitu Sterilization)

- SUS316L stainless steel
- SIP
- Mirror polished
- Use the fewest pipelines that are easy to operate and decrease the dead angles
- Sanitation sample valve and harvest valve which could be sterilized in situ
- Baffled jacket could improve heat exchange
- ABCS-II control system



Specification

Model No.	LBR 300 A	LBR 300 B	LBR 300 C	LBR 300 D
Capacity (L)	10	15	20	30
Vessel	SS316			
Material of Cover	SUS316L			
Working Volume	60%-70%			
Sterilization	Insitu / SIP			
Temperature	+5-60°C±0.2°C			
pH	2-12±0.05pH			
DO	0-150±3% digital display in 0.1% increment			
Antifoam	PID ON/OFF control with a pump			
Catalog No.	44540301	44540302	44540303	44540304

Accessories

Steam Generator	Different capacity / Inbuilt
Air Compressor	10L/min, 0.2~0.4MPa
Cooling Water	Tap water or others clean water
Drain	Not more than 2 meters from the fermentor

Pilot and Process Scale Fermentors (SS Insitu Sterilization)

- SIP
- Mirror polished
- Use the fewest pipelines that are easy to operate and decrease the dead angles
- Sanitation sample valve and harvest valve which could be sterilized in situ
- Baffled jacket could improve heat exchange
- ABCS-II control system



Specification

Model No.	LBR 400 A	LBR 400 B	LBR 400 C	LBR 400 D	LBR 400 E
Capacity (L)	50	70	100	150	500
Vessel	SS316				
Material of Cover	SUS316L				
Working Volume	60-70%				
Sterilization	Insitu / SIP				
Temperature	+5°C-60°C±0.2°C				
pH	2-12				
DO	0-150±3% digital display in 0.1% increment				
Antifoam	PID ON/OFF control with a pump				
Catalog No.	44540401	44540402	44540403	44540404	44540405

Accessories

Steam Generator	Different capacity
Air Compressor	10L/min, 0.2~0.4MPa
Cooling Water	Tap water or others clean water
Drain	Not more than 2 meters from the fermentor

Photobioreactor (Autoclavable)

The Photobioreactors are used for precise phototrophic cultivation of algae and cyanobacteria. They feature a unique combination of the cultivator and monitoring device. Light power and spectral composition as well as the temperature and aeration gas composition can be set with a high accuracy. The illumination unit can be removed easily prior to sterilisation and then clicked back into position following the procedure.



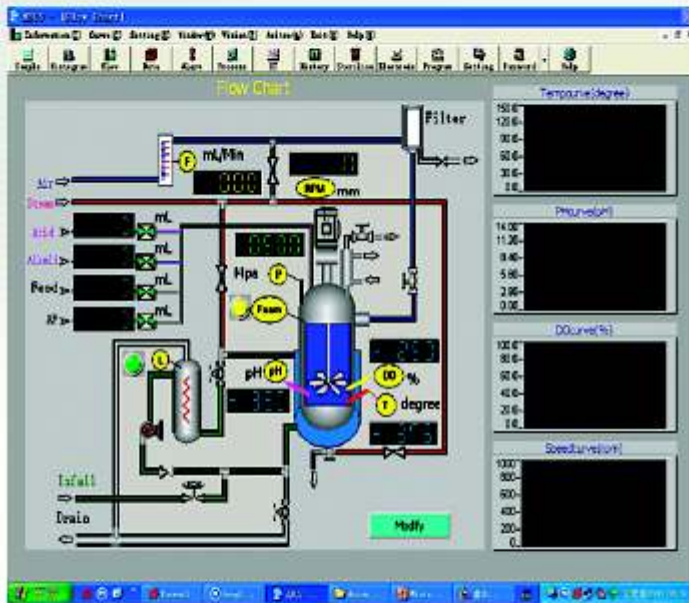
Specification

Model	PBR 500 A	PBR 500 B	PBR 500 C	PBR 500 D
Capacity (L)	3	5	7	10
Vessel	GLASS			
Material of Cover	SUS316L			
Working Volume	60-70%			
Sterilization	Autoclave			
Temperature	+5-60°C			
Light Arrangement	Yes			
pH	2-12			
DO	0-150±3% digital display in 0.1% increment			
Antifoam	PID ON/OFF control with a pump			

Accessories

Light Upgrade	To increase intensity of actinic light up to 2500 $\mu\text{mol photons m}^{-2} \text{s}^{-1}$
Turbidostat	Peristaltic pump and controller to stabilize suspension optical density
O ₂	To measure concentration of dissolved gases
pH Sensor	To monitor pH of the solution in the bioreactor

Control System



Flow Chart

The Main Interface screenshot shows a data table with the following columns: Para, Value, Unit, Mode, SV, Alarm H, and Alarm L. The table contains data for various parameters including Temperature, pH, DO, Speed, Pressure, Air flow rate, and various feed rates. Each row has a 'Modify' button next to it. The interface also includes a 'Process Panel' at the bottom with 'Run' and 'Stop' buttons, and a 'Batch Log' section on the right.

Para	Value	Unit	Mode	SV	Alarm H	Alarm L
Temp	37.0	degree	Auto	37.0	111.0	2.0
PH	6.45	pH	Manual	5.00	14.00	0.00
DO	45.0	%	Manual	70.0	100.0	0.00
Speed	1000	rpm	Manual	400	1000	0
Press	0.000	Mpa	Manual	0.100	1.000	0.000
Air	0.000	mL/Min	Manual	10.00	50.00	0.00
AF	0	mL	Manual		1000	0
Feed1	0	mL	Manual		1000	0
Acid	0	mL	Manual		1000	0
Alkali	0	mL	Manual		1000	0

Main Interface

- Standard automatic on-line monitoring & Control of parameters : Temperature, pH, DO, agitation and anti foam feeding
- Multipliable automatic on-line parameters : air flow rate, pressure, methyl alcohol, ethanol, glucose, specifically amino acid, CO₂, O₂ of exhaust, level and automatic sterilization
- Random batch & random parameter control & monitoring option in the same window
- Information of all the batches in the window, serial number, start time, over time, brief of every batch & duration of every batch

