

**Leaders in the
field of
Microbial
Biotechnology**



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Walk-ins Welcome

Office Hours
Mondays to Saturday
9 AM - 6 PM



BIO·AGE

Equipment & Services

Fermenter/Bioreactor Brochure



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New, highly advanced yet economical series of Fermenters & Bioreactors



Bio-Spin Series of Lab Scale and Pilot Scale Fermenters/Bioreactors are compact and designed for Mass multiplication of microorganisms in precisely controlled growth conditions, manufactured as per ASTM standards, ISO9001:2008/CE certification and comply GMP and GLP guidelines.

Bio-Spin™ L Series

Lab Scale Autoclavable Fermenter



TFT/PLC/Microprocessor Based Fermenter Control Panel



Microbial Culture Vessel



Cell Culture Vessel

Autoclavable Type

Highlights:

- Bio-Spin L Fermenters incorporate round bottom/ Double walled Glass Vessel/ whole glass vessels with digital controlling of pH/ temperature/ agitation and aeration etc.
- They are Microcontroller/ PLC based systems with 5.7"/7"/10" graphic display in TFT/ HMI respectively.
- Interchangeable growth vessels of 2,3,5 and 7 Liters working volumes with Top driven magnetic drive to avoid the possible contamination from mechanical seals. Fermenter vessels with SS 316L are also available in full SS vessel with glass window. Optionally top driven direct coupled with Mechanical seal are also available.

- Equipped with additional ports for the control of dissolved Oxygen/antifoam probe adjustable harvest line for continuous culture for future upgradation by adding the appropriate hose connections and electrodes. System also comes with Out Gas Analysis for CO2/H2S/Methane etc and a multiple gas mixing device for mixing of 3 or 4 gases.

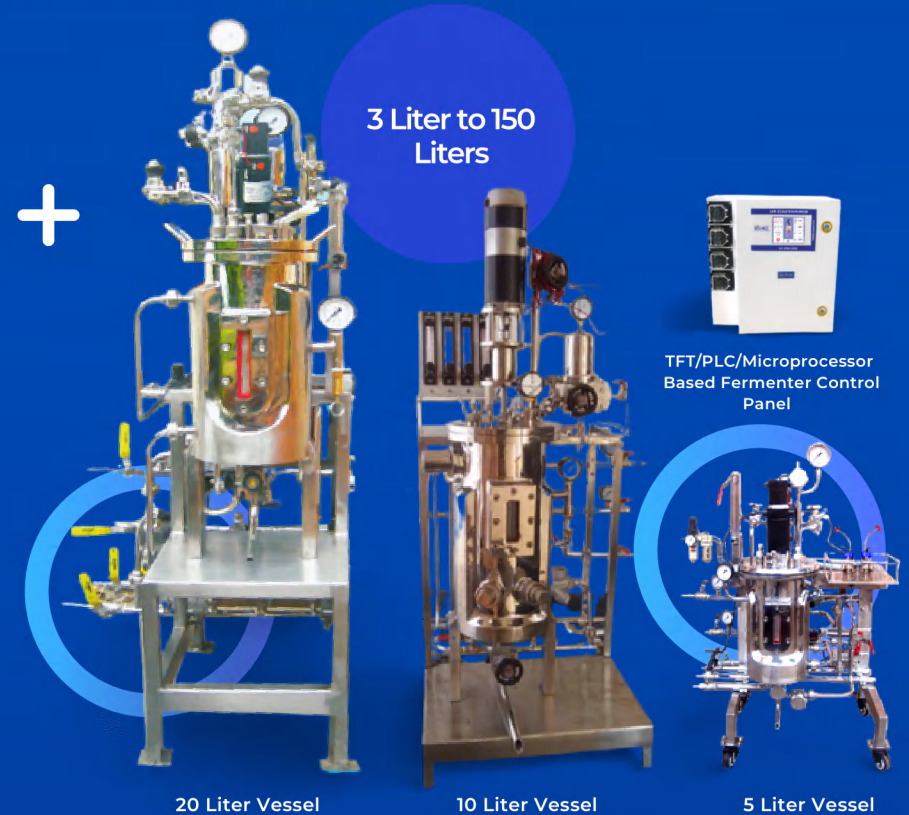
Product Specifications:

Capacity/Working Volume	1.0 Liters to 15.0 Liters / 250ml to 10.0 Liters
Type	Whole Glass/ double jacketed vessel Table Top, Autoclavable type with SS316L Flange.
Controls	Micro controller/ PLC/TFT based Auto Temperature/RPM/pH/DO2 /Antifoam/ Air Flow etc with password protection.
Display	5.7" Graphic TFT Display for microprocessor based systems and 7"/10" HMI Display for PLC based systems.
Top Flange/Head Plate	SS 316L with 25 mm ports for pH/DO2 and temp/heater/Sample Ports of 19mm, feed/inoculation ports etc.
Condenser	SS 316L heat exchanger fitted on the top of the flange with 0.22 micron PTFE filter for out gas and air filtration. Water inlet and out let for circulation of cold water to maintain the reaction volume.
Aeration	Through Glass Metered needle valve Rota meter with ring type air Sparger with inbuilt/ external air pump/ compressor.
Inlet/Exhaust Filters	0.22 micron hydrophobic PTFE filters from 50 mm dia to 2" capsule filters.
Drive	Top/bottom driven direct/ magnetic coupled motor having 20 to 2800 RPM for Microbial Fermentation mode and 20 to 500 RPM for Cell culture Applications.

Impellers	Removable type Rushton turbine impeller with Six/ Four SS316L blades for Microbial applications or Marine type impellers for Cell Culture Applications and other on demand basis.
Baffles	Removable Type Two/ Four number SS316L Baffles provided in Microbial Culture vessels.
Agitation	Variable speed control through PLC/Microprosser control and Display on HMI/TFT.
Peristaltic Pumps	One fixed speed peristaltic pump fitted on the control panel for the addition of feed or substrate, two fixed speed peristaltic pumps for Acid/Base dosing or additional pumps on demand basis.
Heating	Inbuilt Electric heating element fixed / incapsulated in a SS316L tube on the top of flange/ heating blanket.
Temperature Control	PID control through microprocessor with TFT display / PLC with HMI having control accuracy of +0.2 Deg. C.
Software	Data Acquisition/SCADA Software with RS 232C Serial communication/USB Interface to PC for trends/graphs and tabular form DATA AQUISITION with inbuilt memory for one year data storage.
Power Supply	230V+ 10%,AC,50 Hz.

Bio-Spin™ L Series

Lab Scale In-Situ Sterilizable Fermenter(SIP & CIP)



Product Specifications:

Total Capacities	3-150 Liters
Working Volume	2.0 Liters to 115 Liters
Design:	Designed as per ASME standardsto comply with the required pressure in vessels and in Bioprocess.
Type:	SS316L vessel with glass window and SS304 jacket,In-situ Sterilizable(SIP & CIP)

Controls:	Auto temperature/RPM:20-2800/pH/DO2 with cascade control/ Antifoam/Air flow/autosterilization through ModularMicro-controller & PID Controls. Other probes for out-gases etc available on demand.
Drive:	Top driven and direct coupled Motor with single/double mechanical seal.
Steam/Air filtration	0.22 µm PTFE filter Cartridge with SS316L housing plus 0.45/0.22µm prefilter with SS housing.
Control Panel:	Multi colored PLC/TFT Touch Screen/Graphic display Control panel with HMI for monitoring and control of pH/Temp/DO2 and Agitation.
D/H Ratio	1:2.5 Automatic control for Temperature, Sterilization, Agitation, Aeration pH DO, Pressure, Antifoam, Acid, Base, Feed, MFC etc.
Vessel and Jacket Design Parameters	Max. Working Temp for vessel: 150 deg C and for Jacket: 140 deg C Working Pressure for vessel: 3.0 Bar and for Jacket: 3.75 Bar Design Temp. for vessel will be 150 deg and for Jacket 150 deg C, Design Pressure for vessel will be 3.0 Bar and for jacket 4.0 Bar
Provision of Ports	On the top plate with safety valve, agitator, gas outlet, light glass, pressure gauges, additional ports with a cooler, air sparger, air by pass, 3 nos. of standard ports for acid, Alkali and feed. At 1/3 height of shell/vessel from bottom provided with 25 mm standard ports for pH, DO2, temperature probes and a sampling valve in the bottom dish, Jacket - provided with ports for steam/water entry, standard ports, Jacket drain etc.
Agitator Assembly	Shaft, 3/4 nos. of Ruston turbine impellers, single/double mechanical seal. Motor & RPM are customized as per requirement. Accuracy 1 RPM with VFD/Speed controller card etc.
Top Plate	Bolted to the shell. Bottom shell welded to the shell, jacket cover 80% of the total height, All parts in contact with culture made of SS 316 L, Jacket and spiral - SS 304, "O" rings made of EDPM, silicone
Pipe Line Fittings and Accessories	Inlet/outlet cartridge filters with SS316L housing and pressure gauges, meter for flow measurement etc

Steam/Water Connection	With diaphragm control valves to control sterilization temperature. All the valves in the lines connected to the jacket are pneumatically operated from the control panel.
Base frame	Suitable base frame. MOC: SS304 to house the vessel, agitator assembly along with pipe rack etc.

Bio-Spin P Series™

Pilot Scale (SIP & CIP) Fermenter



250 Liter Vessel

200 Liters and above

Highlights:

- Bio-Spin L Fermenters incorporate round bottom/ Double walled Glass Vessel/ whole glass vessels with digital controlling of pH/ temperature/ agitation and aeration etc.
- They are Microcontroller/ PLC based systems with 5.7"/7"/10" graphic display in TFT/ HMI respectively.

- Equipped with additional ports for the control of dissolved Oxygen/antifoam probe adjustable harvest line for continuous culture for future upgradation by adding the appropriate hose connections and electrodes. System also comes with Out Gas Analysis for CO2/H2S/Methane etc and a multiple gas mixing device for mixing of 3 or 4 gases.

Product Specifications:

Design	Designed as per ASME standards to comply the pressure in vessels and in Bioprocess.
Type	SS316L vessel with glass window and SS304 jacket, In-situ sterilizable(SIP & CIP)
Controls	Auto temperature/RPM:20-800/pH/DO2 with cascade control/ Antifoam/Air flow/autosterilization through Modular Micro-controller & PID Controls. Other probes for out-gases etc available on demand.
Drive	Top/bottom driven,direct coupled Motor with single/double mechanical seal.
Steam/Air filtration	0.22 µm PTFE filter Cartridge with SS316L housing plus 0.45/0.22µm prefilter with SS housing.
Control Panel	Multi colored 5.7" TFT touch screen graphic display control panel for monitor/control the pH/Temp/DO and Agitation.

Plate form/Base frame	Suitable Platform/base frame. MOC: SS304/Powder coated MS to house the vessel, agitator assembly along with pipe rack etc.
Other specifications and controls:	As above in Lab scale In-situ sterilizable(SIP&CIP)Fermenters/Bioreactors.
Software for Lab Scale to Pilot Scale Fermenters	Standard data acquisition software with RS-232-C serial port/ USB Interface to communicate with PC for trends/graphs/Tabular form into Excel Format. Optionally SCADA software available for computer controlled fermenter operation
Customized Design	Customized Fermenter vessels with higher capacities are provided with automation and control as per customer's approved drawings available on demand up to 40K L capacity



Upstream & Downstream Accessories / Utilities:

pH Module	On line pH probe, gel filled, sterilizable at 121°C, 15 psi for 15 minutes with transmitter. Range: (0-14) USFDA approved.
DO2 Probe	Online Polarographic with SS housing and transmitter, sterilizable at 121°C at 15 psi pressure for 15 minutes, USFDA approved. OR Online Galvanic type with glass housing and transmitter sterilizable at 121°C at 15 psi Pressure for 15 minutes.
DO2 Control	Cascade control with Oxygen Enrichment and Agitation.
Antifoam/Level Sensor	Online antifoam level sensor with timer and one peristaltic pump for dosing of antifoam solution.
Gas Mixing Module	Gas and air mixing provision, interactive with DO2 control and air filter assembly.
Control Panel Display	Programmable Logic Control touch screen/ TFT for monitoring & display of pH/Temp/DO2 and Agitation.
PLC Touch Screen with HMI/TFT Touch Screen Graphic display and SCADA software	TFT/PLC/Touch Screen Microcontroller with SCADA software for supervisory control of multi fermenters parallel with two way communication through computer. System can be monitored and controlled from a remote computer for getting Trends/ Graphics/History and comparison of data with current vs previous.
Chiller-Circulator	Chiller with circulation facility for digital temperature PID control. MOC:-SS316 for contact parts and SS304 for non contact parts. Control Limits: 5°C to ambient. Customized chillers available on demand.
Lab Water Purification System	Analytical grade Water Purification system for fermentation usage in media preparation etc. for getting 4/6/10/20/50 Lts./Hr.
Air Compressor	Variable capacity air Compressor for in-situ sterilizable fermenter with auto cut off & safety valve.

Boiler (Electric)/ Boiler (Oil fired)	Steam Generator made of SS316 for in-situ sterilizable fermenter with auto cut off & safety Valves. Maximum Capacity: 100 Kg/hr. As per customer requirement. Available on demand from OEM.
Ultrafiltration Module	Cross Flow Ultra Filtration module for Down stream processing/Cell harvesting/ concentration / Desalting / Purification from 200 ml. to 100 Ltr. fermenter broth.
Air Spargers	Ring Sparger, Nozzle Sparger, Porous SS316/ Cellulose Sparger.
Impellers	45° Disc Rushton Turbine, pitched blade, Marine type, 3 Segment Blade Impeller Helical Ribbon.
Gas Analyzers	H2S/ Methane, CO2 /O2 and Dissolved CO2 online monitoring on Demand basis.
Mass Flow Controller	Mass Flow Controller(MFC) for single & multiple gases mixing available on demand basis(imported)
Online OD Meter	Online Optical Density Meter Available on Demand (imported).
Led Light	Powerful illumination for clear view of the contents with LED Lights for Photosynthesis effect provided around the Glass Vessel with Automatic Control through a Timer for a Photoperiod

We also undertake Industrial Training for Bio-tech students and industrial Trainees



Bio-Age also has long running special research and training programs for students in the field of biotechnology and life sciences, giving them a unique experience of working close to a real world industrial environment and its workflow. Contact Us for any relevant queries.

Accessories:



Gas Mixing Module



Steam Generator



Air Compressor



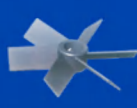
Chiller Water/ Hot Water Circulator



Helical Ribbon Impeller



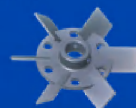
3 Segment Blade Impeller



Pitched Blade Impeller



Marine Type Impeller



45° Disc Rushton Impeller



Our Certifications:



ISO 9001:2015 Certificate No.:105020819 CE Certificate No.:4248
ISO 14001:2015 Certificate No. :201150220
IEC Certificate No.: UQ-2021072278
WHO-GMP Certificate No.:20CN98990356WG



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Note: i) Specifications & Photographs of above models are subject to change without any prior notice due to continuous development in the systems

ii) All property rights for Trademarks rests with Bio-Age Equipment & Services.