



BIOJENIK ENGINEERING

Towards Bio engineering Technology & Solutions



Lab scale Bioreactor / Fermenter

JENIK PASSER Autoclavable Bioreactor

BIOJENIK ENGINEERING

Your Trusted Partner in Bioprocess Engineering

Biojenik Engineering has been providing innovation
and reliable bioprocess engineering solution for
over 15 years



www.biojenikengineering.com



AUTOCLAVABLE BIOREACTOR

Biojenik Engineering Passer A-C offer wide range of autoclavable bioreactor for cell culture application and fermenter for microbial application. Our modular design advanced controller software enhance the process optimization & design of experiments.



Application Areas

Fermentation | Cell Culture | Production Scale | Process Development and Optimization | Biotechnology & Pharmaceutical Industries

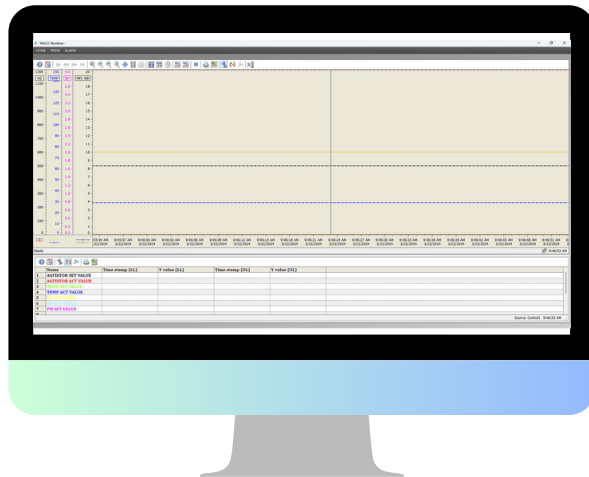
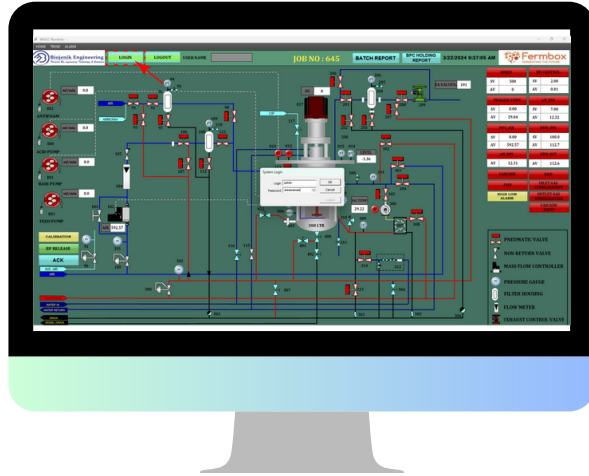


Salient Features

- **Flexible Capacities**
Accommodates various volumes.
- **Universal Connectivity**
Compatible with different connections.
- **User-Friendly Control**
Easy-to-use SCADA system.
- **Customizable Control**
Programmable PLC for tailored operation.
- **Efficient Connectivity**
Open-End OPC with Ethernet.
- **Versatile Cultivation**
Supports batch, fed-batch, and continuous methods.
- **Perfusion Ready**
Includes spin filter for perfusion processes.
- **High-Density Capability**
Suitable for dense cultivation.
- **Aerobic & Anaerobic**
Works for both conditions.
- **Precise Motor**
Servo motor ensures accurate control at low speeds.

Biojenik Engineering SCADA Software

Biojenik Engineering's **SCADA software** is designed for real-time monitoring and control, offering a range of features to improve efficiency and ensure compliance.



- **Software:** Siemens WinCC.
- **Simulation and Auto-Tuning:** Generates random process values for simulation and auto-tuning.
- **Third-Party Integration:** Free OPC server for third-party device integration.
- **Remote Operation:** Webex-based remote operation/control of setpoints.
- **Customized Interface:** Personalize display to show Process, Profiles, Set Points, and Cascade.
- **Batch Management:** Manage batches and track them using tags.
- **Access Control:** Different access levels for enhanced security.
- **Dosage Tracking:** Monitor and record material consumption during production.
- **Real-Time Data Recording:** Automatic recording and trending of setpoints and measurement values.
- **Data Export:** Export data to Excel for analysis and reporting.
- **Data Comparison:** Compare and analyze data for improved decision-making.
- **Event Alarms & History:** Alerts for issues, historical data access, and ANSI-18.2 compliant alarm management.
- **Audit Trail:** Record-keeping compliant with 21 CFR Part 11 standards.
- **Lifetime Support:** One-time license with lifelong updates and support.

Benefits:

- Simplifies process monitoring and control.
- Increases efficiency by automating tasks and tracking.
- Ensures compliance with regulatory standards.
- Provides actionable insights with data comparison and analysis.

Technical Specification

S.No	Specifications	Details		
1	Vessel	- The glass vessel is sterilizable in an autoclave and available in single or jacketed configurations with a round bottom. Made from borosilicate glass 3.3, it offers high chemical resistance and low thermal expansion. It can withstand a maximum pressure of 14 PSI and is equipped with a stainless steel top lid secured with clamps - Aspect ratio : 2 ± 0.5		
2	Volume	Passer - A	Passer - B	Passer - C
		Geometric Volume		
		1.5Lts, 2Lts, 3.5Lts (Heating Blanket and jacketed vessel)	5Lts, 6.5Lts, 7.5Lts (Heating Blanket and jacketed vessel)	10Lts, 13Lts, 15Lts, 18Lts (Heating Blanket and jacketed vessel, Bottom SS Jacket, Top Glass)
		Working Volume		
		1.5Lts - 1Lts 2Lts - 1.5Lts 3.5Lts - 2.5Lts	5Lts - 3.5Lts 6.5Lts - 4.75Lts 7.5Lts - 6Lts	10Lts - 7.5Lts 13Lts - 10Lts 15Lts - 12Lts 18Lts - 15Lts

3	Agitator Assembly	• Material : SS 316L • Baffles : 4 baffles attached with top lid or around the vessel wall • Agitator Type : Top Driven ◦ Seal Type : Mechanical Lip Seal / Magnetic Coupling • Top Driven : ◦ Direct lip seal/magnetic drive with servo/ Brushless DC motor ◦ Measurement accuracy of ± 4 RPM / control accuracy of 1% at full scale • Speed / Accuracy : ◦ Passer A - 25 to 1600 rpm (max) / $\pm 1\%$ ◦ Passer B - 25 to 1200 rpm / $\pm 1\%$ ◦ Passer C - 25 to 1200 rpm / $\pm 1\%$ ◦ For Cell Culture Bioreactor: 25 to 500 rpm • Interchangeable Volume : Available • Tip Speed : 4 to 5 m/sec • Stirrer Diameter : ◦ Passer A - 35 to 60 mm Passer B - 40 to 70 mm Passer C - 50 to 75 mm • Cascade with DO, Motor Protected with Overheat & Overload, Actual Shaft Speed Measurement, Spin filter integration, Increment & Decrement Ramp Setting • Impeller : ◦ Ruston type for Radial flow mixing ◦ Marine type Axial flow mixing (on request) ◦ Pitch blade for Axial flow mixing (on request) , BT6
4	Skid Arrangement	• Single skid arrangement upto 8 fermenter with different volume range
5	Heating/Cooling	• Single wall vessel with heating pad and cooling finger • Jacketed vessel with heating and cooling circuit
6	Perfusion / Rotor Filter	• Internal Perfusion Filter , External Perfusion (Available on Request) • Cell retention filter with pore size from $5\mu\text{m}$ to $20\mu\text{m}$ (smaller pore sizes available on request) • Fixed with shaft
7	Sampling System	• Sampling system with a glass tube for hygienic sampling • Includes dip tube

8	Ports and Needles	• All ports are weld-free, ensuring precision and durability. • Made from single solid flange material. • No of Ports : 10 - 14 ports - Port Sizes: 4mm, 6mm, 12mm, 19mm, PG 13.5mm for sensors.																																												
9	Aeration	• Straight Tube: Submerged aeration for efficient dispersion of bubbles • Ring Sparger: Submerged aeration for superior dispersion of bubbles • Sintered Sparger: Submerged fine efficient low gas flow • Filter: Absolute disposable filter (0.2µm)																																												
10	Aeration System	• Single Gas (Air) • Two Gas Mixing (Air + O2) - (Optional) • Four Gas Mixing (Air, N2, O2, CO2) - (Optional) • Mixed gas combination based on customer request (Optional) • All gas lines equipped with rotometer • Gas line with MFC (Optional) • The MFC module can be upgradable to support different gases, Maximum Gas flow: 2vvm maximum (0.1 to 30 litre/min), Mass flow controllers should have accuracy ±5 % full scale.																																												
11	Gas Line Accessories	• Gas pressure control valve, Check valve, Pressure gauges, Flowmeters, Hypodermic needle, Sterile needle (replaces hypodermic needle)																																												
12	Gas Ranges	• Air: 2 vvm, O2: 0.5 vvm, N2: 1 vvm, CO2: 0.1 vvm, Various ranges selectable as per process requirements																																												
13	Gas Exhaust	• Absolute disposable filter (99.9999% efficiency), 0.2µm, Gas condenser (water-cooled) mounted in the vent line • Optional : Pressure sensor available at the exhaust to detect blockages.																																												
14	Feeding System	• Standard: 4 x fixed speed pumps, 1 x variable speed pump, Additional (on request) • Flow: silicone tube inner diameter(ID): 1 mm to 3.2 mm- 0.004 mL/min to 40 mL/min • Speed range : 0.1 to 400 RPM , bidirectional flow control • All the connectors and bottles are autoclavable. <table><tr><th rowspan="2">Tubesize (ID)</th><th colspan="4">Speed (RPM)</th></tr><tr><th>ml/0.1</th><th>ml/1</th><th>ml/100</th><th>ml/400</th></tr><tr><td>0.5 nm</td><td>0.002</td><td>0.02</td><td>2.2</td><td>9.1</td></tr><tr><td>0.8 nm</td><td>0.004</td><td>0.4</td><td>4.3</td><td>17</td></tr><tr><td>1.6 nm</td><td>0.014</td><td>0.14</td><td>14</td><td>56</td></tr><tr><td>2.4 nm</td><td>0.029</td><td>0.29</td><td>29</td><td>115</td></tr><tr><td>3.2 nm</td><td>0.047</td><td>0.47</td><td>47.5</td><td>190</td></tr><tr><td>4.0 nm</td><td>0.067</td><td>0.67</td><td>67</td><td>270</td></tr><tr><td>4.8 nm</td><td>0.085</td><td>0.85</td><td>85</td><td>340</td></tr></table>	Tubesize (ID)	Speed (RPM)				ml/0.1	ml/1	ml/100	ml/400	0.5 nm	0.002	0.02	2.2	9.1	0.8 nm	0.004	0.4	4.3	17	1.6 nm	0.014	0.14	14	56	2.4 nm	0.029	0.29	29	115	3.2 nm	0.047	0.47	47.5	190	4.0 nm	0.067	0.67	67	270	4.8 nm	0.085	0.85	85	340
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15	Documentation	• The system complies with all QA/QC requirements, including IQ, OQ, and DQ compliance, validated for GMP practices.																																												

Control Module

Speed Controller

- Type: Direct digital control system.
- Control: Cascades with DO controller via HMI on JENIK SCADA.

Temperature Controller

- Pt 100 / 1000 probe (on request)
- Suitable to control the process temperature by active the cooling/heating valve / Circulating water.
- Operate by JENIK SCADA measurement: 4°C to 70°C
- Accuracy : $\pm 1^\circ\text{C}$

pH Controller

- Sensor: Sterilizable gel-type pH probe.(ISM) - Mettler Toledo
- Control: Activates acid/base dosing pump.
- Range: 2 to 12 pH.
- Accuracy : ± 0.02 pH.
- Response Time : < 90 Seconds

DO (Dissolved Oxygen) Controller

- Sensor: Polarographic (ISM) - Mettler Toledo
- Optical (Electrolyte free) optional
- Control: Final element pulsed valve or MFC cascaded with gas mixing station, agitator, and feed pump.
- Range: 0 to 100%.
- Accuracy : $\pm 0.1\%$.
- Response Time : < 90 Seconds

with stand Pressure range- upto 5 bar

CO2 Controller

- Sensor: Sterilizable CO2 probe with transmitter.
- Control: Cascades with pH and gas lines.
- Range: 0 to 1000 mbar.

Antifoam/Level Controller

- Sensor: Conduct-type probe (Anderson NV6 146)
- Control: Activates antifoam correction agent pump; level control - activates feed or harvest pump.
- Response Time : < 80 Seconds

Optical Density / Turbidity Controller

- Sensor: Sterilizable OD measurement probe - Mettler Toledo
- Control: Activates dosing pump or valve.
- Range: 0 to 30 g/L, 0 to 4 CU, 5 to 4000 FTU.
- Accuracy : $\pm 0.1\%$.
- Response Time : < 90 Seconds

Redox/ORP Controller

- Sensor: Sterilizable ORP probe.
- Control: Activates dosing pump or valve.
- Range: +400 to -400V.

JENIK SCADA (PC Interface)

- Suitable PC or laptop with inbuilt Windows OS and runtime license for JENIK SCADA.
- Software: Customized process control interface for real-time monitoring.
- Functions: Profile, cascade, and manual operation; event logging for all parameters.
- Data Management: Online recording, data export to Excel, and customizable access levels.
- MS Office included in the system.

HMI Touchscreen Panel

- PLC control with 7" & 12" HMI (Touch screen panel), SCADA with PC (Optional)

Remote Monitoring

- Compatibility: Local HMI visualization from remote PC or Android mobile via web-based interface.

Exit Gas Analyzer

- O2 Measurement: 0 to 20%.
- CO2 Measurement: 0 to 20%.
- Optional: CH4, H2S, NH4, H2, CO2 available upon request.
- Integrate the data with SCADA software (Optional)

Gravimetric Feed System

- Type: Load cell system with high accuracy (less than 0.01g).
- Control: Cascades with dosing pump, DO, and OD loops.

Light Hood

- Material: Stainless steel with LED.
- Control: Adjustable intensity from 0 to 100% via SCADA.

Accessories

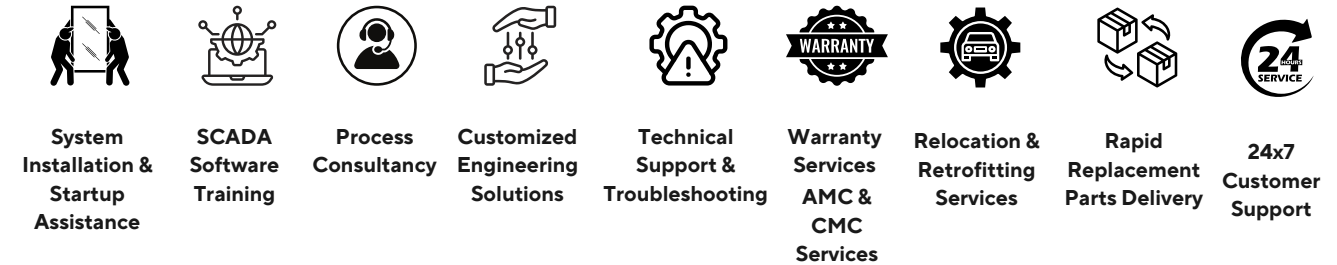
- Chiller Water / Hot water Circulator
- Air Compressor
- Steam Generator
- Autoclave

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Biojenik Engineering Services

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Our Certifications



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