

Solid-substrate Fermenter Configuration



Vessel

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| Capacity | 500L/5000L | 10L-30,000L, customizable |
| Working Volume | 30%-50% | |
| Vessel Material | SUS316L/SUS304; smooth surface, no dead zones, easy to clean | |
| Surface Finish | Inner surface mirror polished, $Ra \leq 0.4\mu\text{m}$; Outer surface mirror polished, $Ra \leq 0.6\mu\text{m}$ | |
| Bioreactor ports | Off-gas port and sight glass port with LED light source; sampling port; temperature port; air inlet; hand hole; jacket water inlet and drain; internal observation sight glass | |
| Inlets | Deep aeration with a detachable gas sparger installed on the vessel sidewall, providing uniform gas distribution without dead zones; easy to clean and capable of meeting high aerobic process requirements. | |
| Discharge | Head-mounted hand hole discharge; propeller-assisted discharge to ensure complete emptying of vessel contents | |
| Sampling | Dedicated sterile sampling port with flame-protected sampling | |

Agitation System

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| Agitation Configuration | Hollow agitation shaft with internal circulation water for auxiliary temperature control Impeller Type: Three-stage helical ribbon scraper impellers with bottom support |
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Control System

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| Hardware Configuration | Siemens PLC + 15-inch LCD touch screen |
| Control Software | Dedicated fermentation control software (independent intellectual property) |
| | Real-time and historical curves; supports 24-hour continuous monitoring and control |
| | Integrated fermentation process analysis software |
| Automatic Sterilization | Sterilization Mode: In-vessel steam sterilization; sterilization timing; over-temperature and over-pressure alarms Post-Sterilization Control: Automatic pressure holding and temperature control after sterilization to ensure sterility Filter Sterilization: Independent filter sterilization; set sterilization temperature and time; automatic drying after sterilization Sterilization Validation: Equipped with cold spot detection |
| Temperature Control | Display Accuracy: 0.3% FS ± 0.1 °C Control Accuracy: ± 0.2 °C Sensor: WIKA Germany Control Function : Dual-direction heating and cooling control; equipped with constant-temperature water tank Data Management: Data logging, production curves, report analysis, remote data transmission |
| Humidity Control | Display Accuracy: 0.3% FS ± 0.1 % Control Accuracy: ± 0.2 % Sensor: WIKA (Germany) Control Function: Atomized spray system for water replenishment; equipped with sterile water tank Data Management: Data logging, process curves, report analysis, remote data transmission |
| Agitation Speed | Speed Range: 0-60 rpm, customizable |

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| | Data Management: Data logging, process curves, report analysis, remote data transmission |
| Pressure | <p>Display Accuracy: 0.01 bar; range: 0-3 bar</p> <p>Sensor: BD (Germany)</p> <p>Control Function: Digital setpoint control for vessel pressure regulation</p> <p>Data Management: Data logging, production curves, report analysis, remote data transmission</p> |
| Optional Configuration | Mass flow controller for automatic inlet gas control; exhaust condenser; exhaust filter; exhaust gas analysis system |