

HEB 3 liters Glass fermenter (Off-situ sterilization)



The fermenter plant offered is comprising fermenter designed and built for a broad range of modern fermentation applications.

The system will be designed to meet all requirements of modern fermentation technology without mechanical sealing, magnetic force stirrer can be used during the sterilization. It is suitable for generic microorganism culture specially for the medicament microbe culture with long ferment cycle. Mechanical stirrer with mechanical sealing is suitable for microbe culture in the ropy medium (i.e. xanthan gum)

System constitute:

Vessel system: Total volume: 3 liters, Working volume: 1-2liters, Stainless steel cylinder combines with glass partly. It uses a large area of highly refractory glass to observe material easily. Magnetic force stirrer without axes sealing. There is no possibility to leak out the bacteria. The view is spacious. The agitation system is hanged up. There is no thimble at the bottom. Ratio of diameter to high: 1:3 Sterilization method: off-situ sterilizing.

Aeration system: Include rotameter, aeration filter

Agitation system: Rotating Speed:50-1000rpm, Accuracy : $\pm 1^{\circ}\text{C}$

Temperature control: Interlayer electric calefaction, auto-control

Airflow control : Manual control, Flow meter display.

Antifoam control and Inducer: Automatically check foam, automatically add antifoam by peristaltic pump. And Inducer.

Feeding control: Control by peristaltic pump switch, automatically feeding and computation.

pH control: Automatically add acid, alkali by peristaltic pump and control Ph accurately.

DO control: Control with rotating speed relatively.

HEB –B Biology process controller: Control parameter: temp, pH, DO, antifoam, stirrer rev, feeding; Pressure, Level,Airflow,O2 flow, Conductivity meter.

Control system: HEB- B Control System: on-site controller, the next crew for the Siemens S7-200 series PLC control system, it is a mature, stable, universal type of PLC, to suit a variety of automation applications, especially in manufacturing process control Application. Its modular, easy to implement distributed configuration and easy to master and so on, Siemens PLC control center has become a biological reaction process control implementation is economical and advanced control system, the system uses the touch screen display, on-site direct operations (menu type), all English menu and interface; also with the host computer for data transmission, data sampling and display tank, the system view of data analysis, reading settings. 10-inch LCD touch-sensitive screen as the display screen to display complete content-rich, user-friendly screen is simple, easy to operate. And disturbing each other. The control system can adapt to different range of sensors and actuators the output of the input signal with the signal anti-jamming system. Software: Siemens S7+ FORCE CONTORL Data collection and control module: Siemens S200 PLC controller and data collection and control module:

1. Control

① Manual control: You can set the percentage of open valve or a valve opening ② automatic control mode: You can select continuous or PID, PID control the switch ③ sequence control: the control of all parameters can be pre-set at least 10 control section, ④ for automatic segmentation remotely control: PC control ⑤ acceptable correlation 1. Control

① Manual control: You can set the percentage of open valve or a valve opening ② automatic control mode: You can select continuous or PID PID control the switch ③ sequence control: the control of all parameters can be pre-set at least 10 control section, ④ for automatic segmentation remotely control: PC control ⑤ acceptable correlation control: the dissolved oxygen can select speed, air flow rate, tank pressure, control of feeding, etc.; pH can choose to control with acid and alkali.

2. Measurement function: can feeding, bubble enemy, such as measurement of pH
3. XY-axis to chart real progress can be any expansion and contraction of graphics display, to help the operator determine the parameters of the interaction between the effects of the fermentation process to quickly modify and adjust.

4. Data Processing

- 1) to show that all the parameters of the trend curve analysis
- 2) to store, display, analyze all the historical curve parameters
- 3) can display all the parameters of the batch report
- 4) copy the data directly with the USB
- 5) data storage format is compatible with EXCEL, EXCEL platform can be to deal with

5. Controller self-protection function: to set the password, others can not modify the fermentation parameters; and the controller is not lost due to power settings for each parameter.

6. Can the process control parameters, each parameter can have 10 block can be set

7. Time display of each parameter recording interval can be adjusted

8. Two parameters can be carried out with the screen settings and calibration

9. Show the controller is really running against, the panel instructed the state process system, process hardware, and motion status indicator for understanding the various devices (such as peristaltic pumps, circulating pumps, heating, mixing, etc.) work status, Fault identification can be used as display

10. Each parameter of the transmission are independent modules, without disturbing each other, for easy maintenance.

11. PH, DO and other parameters of control and associated controls can be adjusted.

PC software: BLBIO-Ver8.0 is a data recording and processing as one of the fermentation of special packages, with the English operation interface, data storage and backup, curve analysis, report generation analysis, anomaly analysis, for the fermentation and production process control and data processing bring a lot of convenience.

Main features:

1. Can record the fermentation time, temperature, pH, dissolved oxygen, rotational speed, air flow, pressure, fill quantity, the amount of foam enemy, acid dosage.
2. Can be sent under the controlled variable settings and control parameters, remote operation.
3. Can be set sequence control
4. Can type off-line parameters, and records show
5. Trend curve, historical curve shows can display 1-10 (any setting) curve; - You can select a different start time and the time period (8,24,48,72,96 and 144 hours);
 - You can set the upper and lower curves show, in order to improve display resolution;
 - You can choose any of several different batches (1-10) curve also shows that for comparative analysis;
 - and Y-axis parallel to the secant by the mouse to drag the reading, followed by curve data is activated, the fermentation time (X axis) and the same time the data curve with the secant movement changes.

6. Report Printing

- can show significant 1-12 (any set) data, and print output;
- You can select a different start time and the time and can choose different time intervals (1,5,15,30,60 minutes);
- You can choose any of several different batches (any set) data, and print output,
- To comparative analysis;

7. curve printing

- You can show the curve was printed by color printer; EXCEL platform can also be carried out in data processing and printing, is very convenient.

Technical Parameter:

No	Parameter	Guideline	Controller data & processing function
1	ph	Displaying range: 0.00~14.00±0.01 Auto-control range:2.00~12.00±0.05 Fermentation process control (According to the fermentation time, auto- control pH fluent, at least10 parts)	pH value historical and trend curve analysis Acid, alkali dosage curve analysis Batch report form analysis Acid, alkali total dosage record Keep and deliver data
2	DO	0-150±3%, Displaying precision: 0.1% It can be controlled by rev and feeding. Fermentation process control (According to the fermentation time, auto- control DO fluent, at least10 parts)	DO value historical and trend curve analysis Batch report form analysis Keep and deliver data
3	Antifoam	Automatic PID control and alarm Fermentation process control (According to the fermentation time, auto- control antifoam fluent, at least10 parts)	Antifoam value historical and trend curve analysis Foam error state record antifoam total dosage record Batch report form analysis Keep and deliver data
4	Rev	Automatic enactment and control (50~1000rpm±5%) Fermentation process control (According to the fermentation time, auto- control rev fluent, at least10 parts)	Rev value historical and trend curve analysis Batch report form analysis Keep and deliver data
5	Temperature	Temperature of cooling water: +5°C-65°C±0.2°C Fermentation process control (According to the fermentation time, auto- control temperature fluent, at least10 parts)	Temperature value historical and trend curve analysis Batch report form analysis Keep and deliver data

No	Parameter	Guideline	Controller data & processing function
6	Feeding	PID automatic enactment and control Fermentation process control (According to the fermentation time, auto- control feeding fluent, at least 10 parts)	Feeding value historical and trend curve analysis Feeding total dosage record Batch report form analysis Keep and deliver data
7	Pressure	Auto control	
8	Air Flux	Auto control	
9	Conductivity meter	Automatic detection	
10	O2 Flow	Auto control	
11	Level	Auto control	

Material and brand of key components

No	Key component	Material and brand
1	Vessel system	The cylinder designed by our company uses stainless steel combined with glass partly. Stainless steel: SUS316L. Glass: borosilicate glass. The framework is advanced.
2	Buncher	High grade aluminum alloy
3	Speed regulator	Panasonic, Japan
4	Solenoid valve	Taiwan
5	Aeration filter	0.2µm, import filterable membrane
6	Breathing filter	0.2µm, SARTORIUS, Germany
7	pH electrode	Mettler-Toledo, Switzerland
8	DO electrode	Mettler-Toledo, Switzerland
9	Peristaltic pump	Britain

Working environment:

- ☑ Up to the internal & external environment required by fermentation
- ☑ Up to the technic-required water supply. The temperature of cooling water is at least 5°C below the temperature of fermentation
- ☑ Power requirement: AC120V
- ☑ Compressed air: Primarily-processed compressed air, relative humidity: ≤60%, ventilatory capacity is accorded to the technics.