济辰生物
JICHEN BIOTECH

生物制药
全自动玻璃生物反应器

AUTOMATIC GLASS BIOREACTOR

Science to Success: Your Premier Bioreactor Partner

从实验室到商业化的生物反应器合作伙伴

济辰生物
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全自动玻璃生物反应器/发酵罐 BR系列

Fully automatic glass organism

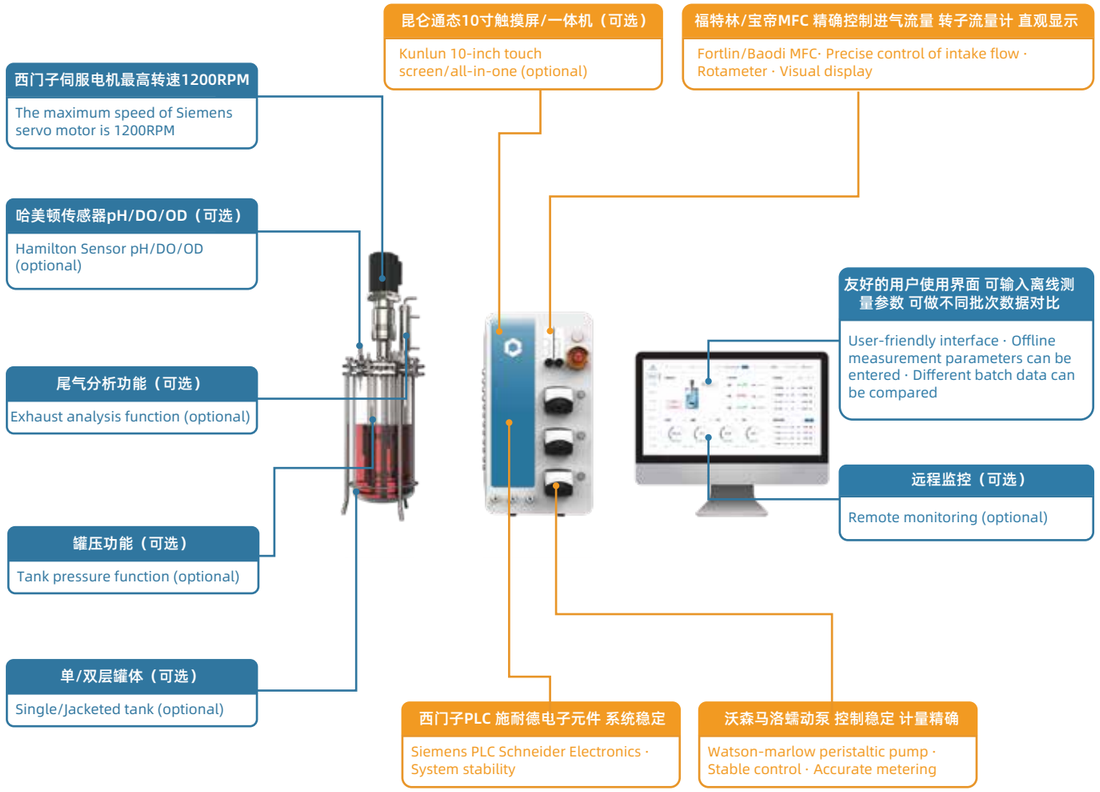
Fully automatic glass bioreactor/fermenter-BR series

BR系列生物反应器是一款组合灵活，功能全面，操作简便的生物反应器，可用于批次，流加，连续/灌注培养过程，采用上磁力搅拌配合伺服电机，搅拌器可与玻璃罐体整体灭菌，避免染菌，可用于多种细胞培养，且软件本土化，操作界面友好度高。广泛应用于单抗/疫苗企业研发中心，高校/科研中心的实验室等地。

The BR series bioreactor is a of flexible, full-featured, and easy-to-operate bioreactor that can be used for batch, fed-batch, and continuous/perfusion culture process. It adopts upper magnetic stirring with servo motor, and the stirrer can be sterilized as a whole with the glass tank to avoid bacterial contamination. This allows if to be suitable for a variety of cell cultures and the software is localized with a user-friendly operation interface. It is widely used in R&D center of monoclonal antibodies/vaccine companies, laboratories of universities/research centers, etc.

01

产品结构 /PRODUCT OVERVIEW



02

产品特点 /PRODUCT FEATURES

组合灵活 /Flexible combination

一个标准主控台可对接多个不同功能罐，实现多种培养工艺。标准功能罐有2L/5L/10L等规格,并可定制

A standard main console can be connected to multiple tanks with different functions to achieve a variety of culture processes. Standard function tanks are available in 2L/5L/10L specifications and can be customized

功能全面 /Fully functional

配备多种参数的精确检测与控制，配备关联控制/串级控制/顺序控制等多种控制策略

Equipped with accurate detection and control of varions parameters, with a variety of control strategies such as association control/cascade control/sequence control

操作简便 /Easy to operate

模块化设计，符合人体工学需求；人机界面引入操作工艺设计，使用方便快捷，视觉清晰

Modular design, ergonomic requirements; Human-machine interface introduces operation process design, easy to use, clear vision

多联生物反应器/发酵罐 FR-P系列

concatenate

Multiplex bioreactor/fermenter-FR-P series

FR-P系列是采用一套自控系统来控制多套反应器系统的解决方案，多合一的组合设计既节约了设备所需空间，又提供了灵活的实验设计同时保证了多台罐体的平行性，为您提供工艺开发和小规模样品生产的理想工具。

The FR-P series is a solution that uses asingle automatic control system to control multiple reactor systems. The multi-in-one combination design not only saves the space required by the equipment, but also provides flexible experimental design and ensures the parallelism of multiple tanks, providing you with the ideal tool for process development and small-scale sample production.

在使用过程中，多套罐体可同时使用也可分开作为独立的培养设备使用。支持相同体积罐体培养，也可自由组合不同体积罐体，用于大小和功能完全不同的多个设备的同时培养不同的生物产品。
扩展功能：可增加移种策略，搭配小体积罐体作为种子罐，大体积罐体做为生产罐。

In the process of use, multiple sets of tanks can be used at the same time or can be separated as independent cultivation equipment. It supports the same volume tank culture, and can also be freely combined with different volume tanks for the simultaneous cultivation of different biological products in multiple devices with completely different sizes and functions.
Expansion function: can increase the seed transfer strategy, with a small volume tank as a seed tank and a large volume tank as a production tank.

01

产品特点 /PRODUCT FEATURES

主要技术参数 /Main technical parameters

- 型号：FR-P系列(多联生物反应器/发酵罐)
- 罐体体积：500ml、1L、2L、3L、5L、7L、10L、15L、20L可选，配置多组，可自由组合
- 加热方式：加热毯/夹套水循环温控方式
- 控制系统：西门子1200/1500控制系统

- Model: FR-P series (multiple bioreactor/fermenter)
- Tank volume: 500ml, 1L, 2L, 3L, 5L, 7L, 10L, 15L, 20L optional, configurable multiple groups, can be freely combined
- Heating method: Heating blanket/jacket water circulation temperature control method
- Control system: Siemens 1200/1500 control system

图形界面并联控制系统 /Graphical interface parallel control system

- 人机交互体验舒适，操作简单便捷，支持外部扩展
- 实现数据可视化、过程变化一目了然
- 精细化设计，颜色分区鲜明，功能细节完善

- Comfortable human-machine interface experience, simple and convenient operation, and support for external expansion
- Data visualization and process changes at a glance
- Fine design, bright color partition, and perfect functional details

生物反应器应用 Apply

Bioreactor application

- **哺乳动物细胞、干细胞、昆虫细胞、植物细胞、藻类细胞和微生物培养**
  Culture of mammalian cells, stem cells, insect cells, plant cells, algal cells and microorganisms
- **悬浮或贴壁培养**
  Suspension or adherent culture
- **微氧、厌氧、放热发酵过程**
  Micro-oxygen, anaerobic, and exothermic fermentation process
- **适用于从研发到中试规模生产的所有实验室**
  Suitable for all laboratories from R&D to pilot scale production

应用范围 Scope of application

适用领域 Field of application

- **分泌型产品、疫苗和单抗的生产**
  Production of secretory products, vaccines and monoclonal antibodies
- **干细胞研究与应用**
  Stem cell research and application
- **精细化工过程**
  Fine chemical process
- **食品和饮料加工生产**
  Food and beverage processing production

人机交互界面 Interface

Human-machine interface

简约的操作界面
Simple operation interface

·化繁为简，所需功能单元在主界面一应俱全
·所有控制策略一键启动，简单便捷
·生产数据一目了然
·可进行远程操作及数据监控

· All required functional units are available on the main interface
· All control strategies are simple and convenient to start with one click
· Production data at a glance
· Remote operation and data monitoring

操作界面

满足GMP要求
Meet GMP requirements

三级权限管理、电子签名、审计追踪、批记录、操作记录等功能满足GMP对药品生产管理数据可追溯的要求

Three-level authority management, electronic signature, audit trail, batch records, operation records and other functions meet the requirements of GMP for the traceability of drug production management data

GMP验证

完整的数据记录
Complete data record

趋势图、报表均包括搅拌、温度、pH、DO、通气流量、蠕动泵等关键参数的实时和历史数据

Trend charts and reports include real-time and historical data on key parameters such as agitation, temperature, pH, DO, ventilation flow, and peristaltic pumps

数据记录

细胞培养 Table 1

Cell culture

型号 Model number		500ml	3L	5L	7L	10L	15L
罐体 Tank body	总体积(ml) Total volume (ml)	538	3100	4800	6800	10000	16500
	工作体积(ml) Working volume (ml)	100-400	1000-2700	1500-3400	1500-5000	3000-7000	4500-10000
气体分布器 Gas distributor	大泡孔径 Aperture	0.5mm	0.8mm				
	微泡孔径 Microbubble aperture	无 not have	5μm/20μm可选 5μm/20μm Optional				
搅拌桨 Agitator paddle	桨叶类型 Blade type	象耳 Elephant ear					
	桨叶直径（mm） Blade diameter (mm)	35	45	60	68	75	88
搅拌 Stir	转速范围 Speed range	10-400					
温度控制 Temperature control	温控范围(℃) Temperature control range (℃)	5-70			5-65		
	控制精度(℃) Control accuracy (℃)	±0.2					
pH	控制范围 Control range	0-14					
	控制精度 Control accuracy	±0.02					
DO	范围 Radius	0-200					
	控制精度（%） Control accuracy (%)	±3%	±2%	±2%	±2%	±2%	±1%
MFCS	空气(约500 sccm) Air (about 500 sccm)	0-0.1L	0-0.5L	0-1L	0-1L	0-3L	0-3L
	空气(约100 sccm) Air (about 100 sccm)	无 not have					
	氧气(约500 sccm) Oxygen (about 500 sccm)	0-0.1L	0-0.5L	0-1L	0-1L	0-3L	0-3L
	氧气(约100 sccm)微泡可选配 Oxygen (about 100 sccm) microbubbles are optional	0-0.1L	0-0.1L	0-0.25L	0-0.5L	0-0.75	0-1L
	二氧化碳(约100 sccm) Carbon dioxide (about 100 sccm)	0-0.1L	0-0.1L	0-0.25L	0-0.5L	0-0.75	0-1L
蠕动泵 Peristaltic pump	变速泵转速范围(rpm) Variable pump speed range (rpm)	0-300rpm					
	变速泵流速范围(ml/min) Velocity range of variable speed pump (ml/min)	16#管0.5-190ml/min 16# tube 0.5-190ml/min					0.2-190ml/min
	定速泵转速范围(rpm) Constant speed pump speed range (rpm)	18/20/60常用 1-300rpm可任选 18/20/60 commonly used 1-300rpm optional					
	定速泵流速范围(ml/min) Constant speed pump flow rate range (ml/min)	常选14#，16#，25#管流量不同，0.2-230ml/min Often choose 14#, 16#, 25# tube flow is different, 0.2-230ml/min					
尾气 Exhaust	有无冷凝管 Condensing tube or not	有 Have					
	冷凝方式 Condensing mode	半导体 semiconductor	水冷/半导体可选 Water cooled/semiconductor optional				
预留功能 Reservation function	预留信号接口数量 Number of reserved signal ports	选配 Assorting					
	称重模块 Weighing module	0/2/4可选 0/2/4 Optional					
	是否自带DOE软件 Whether it comes with DOE software	选配 Assorting					
平行控制 Parallel control	最多可控制发酵罐数量 Maximum number of fermenters can be controlled	16					

微生物、藻类培养 Table 2

Microorganism and algae culture

型号 Model number		500ml	3L	5L	7L	10L	15L
罐体 Tank body	总体积(ml) Total volume (ml)	500	3170	5600	7460	10000	16500
	工作体积(ml) Working volume (ml)	100-400	1000-2100	1500-3500	1500-5000	3000-7000	4500-10000
气体分布器 Gas distributor	孔径 Aperture	0.5mm	0.8mm/1mm	0.8mm/1mm	0.8mm/1mm	0.8mm/1mm	0.8mm/1mm
搅拌桨 Agitator paddle	桨叶类型 Blade type	1*六直叶1*消泡 1* six straight leaf 1* defoaming	2*六直叶+1*六斜叶+1*消泡桨 2* six straight blades +1* six oblique blades +1* defoaming paddle				
	桨叶直径（mm） Blade diameter (mm)	35	56	68	77	86	99
搅拌 Stir	转速范围 Speed range	50-1200					
温度控制 Temperature control	温控范围(℃) Temperature control range (℃)	5-70	5-70	5-70	5-65	5-65	5-65
	控制精度(℃) Control accuracy (℃)	±0.2					
pH	控制范围 Control range	0-14					
	控制精度 Control accuracy	±0.02					
DO	范围 Radius	0-200					
	精度（%） Accuracy (%)	±1%					
MFCS	空气 Air	有 Have					
	氧气 Breath	可选 Optional					
蠕动泵 Peristaltic pump	变速泵转速范围(rpm) Variable pump speed range (rpm)	0-300rpm					
	变速泵流速范围(ml/min) Velocity range of variable speed pump (ml/min)	16#管0.5-190ml/min 16# tube 0.5-190ml/min					0.2-190ml/min
	定速泵转速范围(rpm) Constant speed pump speed range (rpm)	18/20/60常用 1-300rpm可任选 18/20/60 commonly used 1-300rpm optional					
	定速泵流速范围(ml/min) Constant speed pump flow rate range (ml/min)	常选14#，16#，25#管流量不同，0.2-230ml/min Often choose 14#, 16#, 25# tube flow is different, 0.2-230ml/min					
尾气 Exhaust	有无冷凝管 Condensing tube or not	有 Have					
	冷凝方式 Condensing mode	半导体 semiconductor	水冷/半导体可选 Water cooled/semiconductor optional				
预留功能 Reservation function	预留信号接口数量 Number of reserved signal ports	0/2/4可选 0/2/4 Optional					
	尾气分析仪模块 Exhaust gas analyzer module	选配 Assorting					
	称重模块 Weighing module	选配 Assorting					
	是否自带DOE软件 Whether it comes with DOE software	选配 Assorting					
平行控制 Parallel control	最多可控制发酵罐数量 Maximum number of fermenters can be controlled	16					

在线葡萄糖/乳酸传感器 sensor

Online glucose/lactic acid sensor

C-CIT在线葡萄糖/乳酸传感器系列产品是一种基于酶电化学原理的传感器系统，用于对细胞系、培养基和工艺开发项目过程中连续在线监测葡萄糖和乳酸。
该传感器系统可在一定的时间（21天）范围内显示细胞培养的相关生长行为和代谢状态。数据生成频率为20秒/次，全天观察您的细胞培养状态。也可直接与OPC服务器连接，通过葡萄糖消耗和乳酸生成的在线监测来实现过程反馈控制。

The C-CIT Online Glucose/lactic Acid sensor family is a sensor system based on the principle of enzyme electrochemistry for continuous online monitoring of glucose and lactic acid during cell lines, media and process development projects.
The sensor system can display the relevant growth behavior and metabolic state of the cell culture over a certain time range (21 days). Data is generated at a frequency of 20 seconds/time, and your cell culture status is observed throughout the day. It is also possible to connect directly to the OPC server for process feedback control through on-line monitoring of glucose consumption and lactic acid production.

反馈控制系统 /Feedback control system

- 带接收器的平板电脑 (PC)
- 变送器 (Beamer)
- 传感器 (Sensor)
- 蠕动泵

- Tablet with Receiver (PC)
- Transmitter (Beamer)
- Sensor
- peristaltic pump

传感器 /sensor

- 流通池式传感器 (有效防止细胞在传感器周围沉积)
- 流通池式传感器带循环泵 (Micro Pump) (推荐)

- Flow cell sensor (Effectively prevents cells from depositing around the sensor)
- Flow cell sensor with circulating Pump (Micro Pump) (Recommended)

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产品特点 /PRODUCT FEATURES

CITSens Bio

· 连续在线监测葡萄糖或乳酸
· 优化分析单一参数（一个参数传感器）
· RFID 通讯连接

· Continuous online monitoring of glucose or lactic acid
· Optimized analysis of a single parameter (a parameter sensor)
· RFID communication connectivity

CITSens MeMo

· 连续在线监测葡萄糖和/或乳酸
· 同时检测分析两个参数（一个传感器+一个电子元件）
· 蓝牙通讯连接

· Continuous online monitoring of glucose and/or lactic acid
· Simultaneous detection and analysis of two parameters (one sensor + one electronic component)
· Bluetooth communication connection

CITSens Bio/MeMo APC

· 连续在线监测葡萄糖和/或乳酸
· 泵直接连接以葡萄糖为基础介质的进料系统以实现过程控制
· 整个控制过程无需人工取样和进料
· 可连接到第三方系统：1、EVE®过程控制软件
2、连接用于数据库交换的ODBC和OPC服务器

· Continuous online monitoring of glucose and/or lactic acid
· The pump is directly connected to the glucose-based feed system for process control
· No manual sampling and feeding is required during the entire control process
· Connection to third-party systems: 1. EVE® process control software 2. Connection to ODBC and OPC servers for database exchange

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传感器检测范围 /SENSOR DETECTION RANGE

	葡萄糖 /Glucose	乳酸 /Lactate	
高葡萄糖 /High Glucose	0.5 - 5.0 g/L	————	±0.1 g/L
低葡萄糖 /Low Glucose	0.3 - 2.5 g/L	————	±0.1 g/L
乳酸 /Lactate	————	0 - 1.35 g/L	————
结合(Glu / Lac) /Combined (Glu/Lac)	0.5 - 5.0 g/L	0 - 1.35 g/L	±0.1 g/L