Биореактор 5 л для культивирования клеток
Технические характеристики

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5 L Bioreactor for Cell Cultivations

Novel magnetically coupled drive: eliminates the risk of contamination within the vessel since there is no mechanical seal.
Mixing and aeration: tailored for cell cultivation (plant and mammalian cells).
Autoclavable sampling port: The sterilisable port facilitates operational activities.
Uniform lid construction: No welded components within the lid for easy maintenance and sterility.
Flexible working volume: 5 L bioreactor with working volume up to 4.5 L.

Product Description

Our innovative fully automated and autoclavable laboratory bioreactor is designed for R&D and process development. It has a robust design, yet it is compact and ergonomic. The vessel is mounted between a jacketed base and a non-welded lid.

The uniform lid features all the necessary ports and sensors that might be required for cell cultivation processes.

There is a sterilisable sampling port conveniently located in the base of the vessel to facilitate operational activities during a process.

The magnetically coupled drive which can reach up to 1500 rpm ensures excellent sterility within the vessel.

The bioprocess controller ensures:

1) Temperature regulation by supplying a control signal either to the heating element or the electro-magnetic cooling water valve of the thermostat. Thermoregulation is carried out by circulation of thermostated water through the bioreactor's jacket, which is located in the bottom lid of the vessel;

2) pH control by supplying base or acid solutions to the bioreactor medium using the bioprocess controller's peristaltic pumps;

3) pO_2 control by automatic adjustments of the stirrer's rotational speed. The actual pO_2 value is monitored using a pO_2 electrode;

4) Foam control by supplying an antifoam agent to the bioreactor's medium using the bioprocess controller's peristaltic pumps. The foam level is monitored using a conductivity sensor;

5) Feeding of a substrate by using the bioprocess controller's peristaltic pump and the respective feeding rate/volume is controlled by the feeding profile, which is set in the bioprocess controller;

6) Level control by using the bioprocess controller's peristaltic pump. The medium level is monitored using a conductivity sensor;

7) Mixing by using a magnetic drive, the agitator is driven by a motor which is mounted on the top lid of the bioreactor.

Options

Bioreactor	Product Option
5 L Bioreactor for Cell Cultivation	Optical density sensor with ARC view 265 transmitter and accessories (Hamilton)
	Viable cell density sensor with ARC view 265 transmitter and accessories (Hamilton)
	Methanol/ethanol gas sensor (BlueSens)
	Methanol/ethanol immersed sensor (Raven Biotech)
	Overpressure sensor , autoclavable, 0-1 bar, measuring accuracy +/- 0.02 bar
	Overpressure control, 0-1 bar, control accuracy +/- 0.0 bar.
	O_2/CO_2 analyzer BlueInOne Cell (BlueSens), including flow adapter
	Mass flow controller for air
	Mass flow controller for O_2
	Volumetric oxygen mass transfer coefficient kLa, Oxygen uptake rate OUR, CO_2 exchange rate CER (includes overpressure sensor and O_2/CO_2 analyzer)
	Pitched blade impeller set with bushings
	Rushton turbine set with bushings
	Microsparger
	Factory accepted test FAT
	SCADA for monitoring, control and reporting according the requirements of 21 CFR Part 11

Specification

Bioreactor 5.2 (cell cultures)	
Vessel	
Total Volume (L)	6.2
Working Volume (L)	2 – 4.5
Inside Diameter/Inside Height (mm)	150 / 350
Ports	Mixer drive; pH, DO, T, foam, liquid level sensors; tree needle port for acid base and anti-foam agent addition; chemo-stat tubes for level control and addition of bioreactor feed solutions; aseptic pierce-able membrane port; in-let gas port (0.2 µm filter added); exhaust gas port (0.2 µm filter added); 2 spare ports/ The ports are 4×10 mm, 4 x 7.5 mm – 7×12 mm (PG 13.5 mm)
Sampling	Double walled base ensuring bioreactor thermostating. Autoclavable aseptic sampler
Aeration	
Control	Rotameters (2), TMFC (option)
Gas Supply	Air/Carbon dioxide + Oxygen, N_2 (option) Air/Carbon dioxide in headspace
Flow Range, L/min	0.1 – 2
Sparger	Microsparger
Filters	D50 mm 0.2 µm PTFE
Exhaust gas condenser	Cooling from water – line or chiller
Mixing	
Drive	Top magnetic coupling
Rotation Speed Range (rpm)	40 – 500
Mixer (Impellers)	2 pitched blade impellers
Control	
Controller	Siemens Simatic S7 – 1500

Bioreactor 5.2 (cell cultures)	
Operator panel	Touch screen Beetronics, 15TS7, 15”
Temperature	Built-in thermostat. Control range: from 5°C via coolant to 60°C. Accuracy: (measurement) +/- 0.1°C, (control) +/- 0.2°C
pH	Hamilton sensors (different options, including ARC). Acid/ Base Base/CO2 2 – 12 +/- 0,01pH units
pO_2	Hamilton sensors (different options, including Arc).
Foam	Option
Overpressure (option)	The control range 0-1 bar, measuring accuracy +/- 0.02 bar, control accuracy +/- 0.04 bar
Feeding	0.02 – 40 ml/min according to adjusted profile
Peristaltic Pumps	4 built-in peristaltic pumps. External pump (option)
Communication and data exchange	Ethernet connection to LAN or WAN for remote maintenance or OPC; WiFi connection (VNC server) for smart phones and tablets
Dimensions (mm)	930 (W) x 800(H) x 600(D)
Autoclaving space required (mm)	590 (H) x 270 (D)
Optional sensors	Culture turbidity (optical density), culture permittivity (viable cell density), conductivity, methanol/ethanol, off-gas analysis (Oxygen, Carbon dioxide, CH_4), etc.
Fed-batch control (option)	Model based fed-batch control, using supplement PC program (based on Matlab or Python), and connected with SCADA trough OPC server.

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