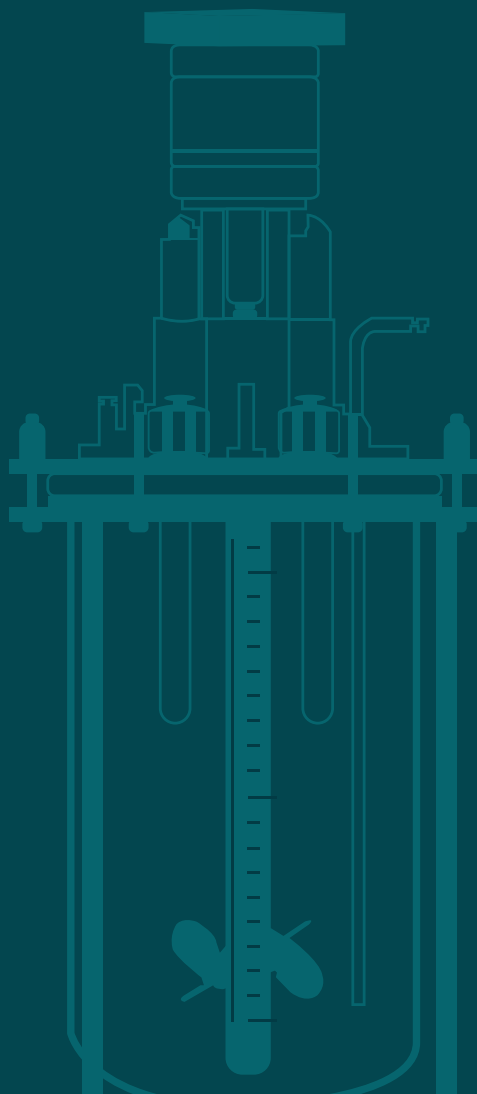


CytoLinX[®] GB

Benchtop Glass Bioreactor



CytoLinX® GB 1-20 L Benchtop Glass Bioreactors

The CytoLinX® GB benchtop glass bioreactors are available in 1 L, 3 L, 7 L, 15 L, and 20 L with a new design and high flexibility, allowing the use of existing brands of electrodes, tubes, gas distributors and stirring paddle. The bioreactor is composed of a glass vessel and a control cabinet; it is widely used in the upstream process development of biologics, suitable for exploration of high-throughput parameter conditions and optimization of the culture process, and applicable for the culture of various cells, including suspension cells, adherent cells, plant cells, insect cells.



Figure 1. CytoLinX® GB 1-20 L Benchtop Glass Bioreactor

CytoLinX® GB for ADC Conjugation Process Optimization

BioLink provides an automated platform for the optimization of the ADC conjugation process: Features such as **precise temperature control and programmable automatic dosing** ensure high repeatability and stability of the reaction system, and the kettle design is more feasible for manufacturing and linear scale-up. The synthesis platform has excellent scalability and can be equipped with online pH sensors to enhance process development monitoring and control. In addition, **the automatic program** is designed to significantly avoid errors caused by manual operations, thereby ensuring consistency between synthesis batches.

CytoLinX® GB for mRNA Production

The development difficulty and the key technical points of mRNA technology lie in the synthetic modification and delivery systems. In Vitro Transcription (IVT) is the most efficient method for batch synthesis of mRNA. It is a relatively complex enzymatic process that requires the addition of enzymes, nucleotides, and other related reagents, in addition to the DNA template. BioLink provides a fully automated IVT synthesis platform that enables efficient linear scale-up from lab-scale development to scale-up production. With features such as **precise temperature control and programmable automatic dosing**, the CytoLinX® GB benchtop glass bioreactors ensure the high **repeatability and stability** of the synthesis system, and the **automatic program design** significantly avoids the errors caused by manual operations to ensure the consistency between synthesis batches.

CytoLinX® GB Control Cabinet

The CLX-GB control cabinet includes control hardware and underlying hardware modules. The control hardware is built with Siemens win CC framework, which meets requirements from development to manufacturing and complies with 21 CFR Part 11.

The underlying hardware modules are all built with imported brands, featuring high stability. In addition, a variety of PAT tools can be flexibly configured to meet different customer needs and application scenarios.

A CLX-GB control cabinet can be interfacing with different models of glass vessels, achieving versatile use with a single unit.

The CLX-GB vessel adopts a top stirring mode and allows a flexible combination of microbubble and large bubble, promoting the optimization of the culture process, further improving cell density as well as maintaining cell viability.

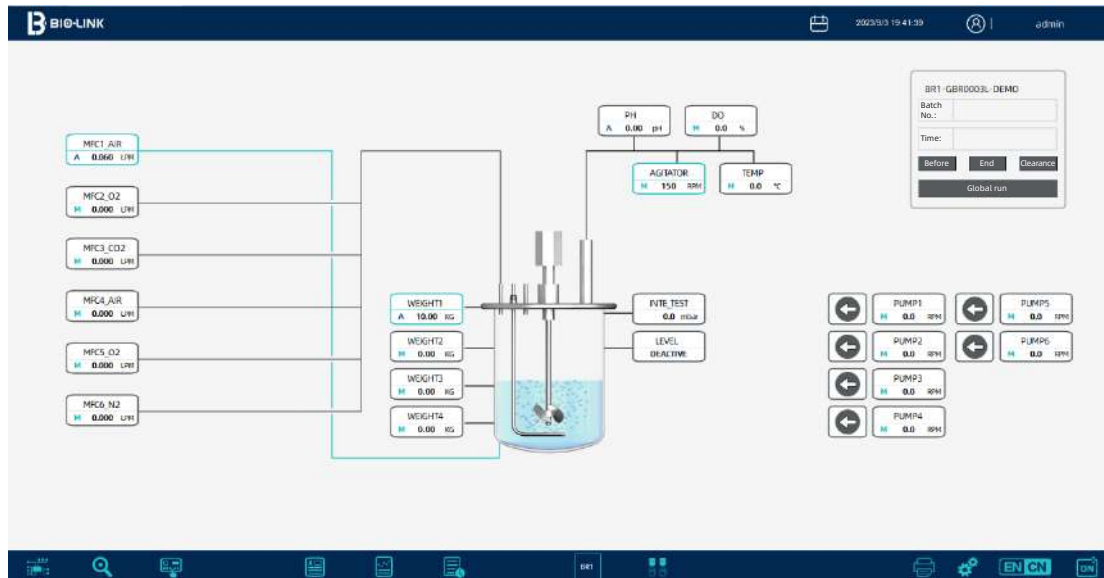


Figure 2. CytoLinX® GB main control interface

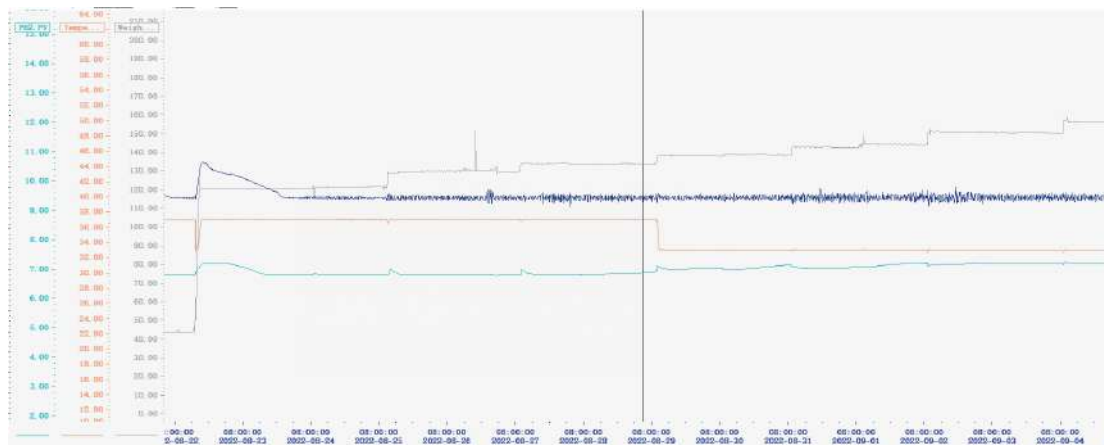


Figure 3. CytoLinX® GB culture results

Features of CytoLinX® GB Benchtop Glass Bioreactors

► High configurability

High flexibility, high compatibility, and more options for process development and characterization

► Wide application

Customizable upon special process requirements of customers, applicable in ADC and mRNA fields

► High ruggedness

High borosilicate glass vessel, high-temperature resistant, corrosion resistant and easy to clean



► High stability

Excellent equipment control stability, temperature, pH and DO linkage effect

► High selectivity

Large bubble and microbubble available to meet various process requirements

CytoLinX® GB Glass Vessel

The function and structure of the vessel are carefully designed to meet the actual requirements of users. Vessels are available in 1 L, 3 L, 7 L, 15 L, 20 L, and standard covers and connectors can meet the customized requirements of different experiments. All components in contact with liquid are made of high-quality 316 L stainless steel, with the surface mirror-polished and electrochemically polished.

CytoLinX® Integrity Tester

The culture process using bioreactors requires an absolutely sterile environment. Therefore, it is necessary to conduct an integrity test on the culture container to ensure the biosafety of the culture process. The integrity test can ensure the correct installation and integrity of the components in the culture container. The CytoLinX® integrity tester is easy to use, automated, accurate and reliable. It provides a simple and intuitive user experience, as well as flexible customization options, perfectly fitting your process requirements.



CytoLinX® TCU

CytoLinX® TCU is a temperature control machine supporting CytoLinX® GB glass bioreactors and desktop stirring system, which can realize cooling and heating operations in the same machine. It features reasonable structure, easy operation and good stability, and can be widely used in pharmaceutical, scientific research, biology, laboratory and other industries.



Standard Configuration of CytoLinX® GB

	Total volume	1 L	3 L	7 L	15 L	20 L
Vessel (single-wall)	Max. working volume	0.8 L	2.4 L	5.6 L	12 L	16 L
	Min. working volume	0.2 L	0.6 L	1.4 L	3 L	8 L
	Working diameter to height ratio (H/D)	1.5/1	1.5/1	1.8/1	1.45/1	1.5/1
	Material	High silicon borate				
Vessel (jacket)	Max. working volume	NA	2.4 L	5.6 L	12 L	NA
	Min. working volume	NA	0.6 L	1.4 L	3 L	NA
	Working diameter to height ratio (H/D)	NA	1.5/1	1.8/1	1.4/1	NA
	Jacket volume	NA	1.2 L	2.4 L	7.4 L	NA
	Material	High silicon borate				
Vessel cover	Port	M30*1 M18*1.5*3 10 mm*6 6 mm*3	M30*1 M18*1.5*6 12 mm*2 10 mm*9	M30*1 M18*1.5*6 12 mm*2 10 mm*10	69 mm*1 27 mm*6 12 mm*2 10 mm*10	69 mm*1 27 mm*6 12 mm*2 10 mm*10
	Material	SS316L				
Stirring system	Mode	Top servo brushless motor				
	Stirring speed	0-1500 rpm				
Sensor	pH	Hamilton smart pH electrode, VP8 joint				
	DO	Hamilton smart optical dissolved oxygen electrode, VP8 joint				
	Temperature	Pt 100, Grade A, 0-150°C				
	Level/antifoam	Resistance type, automatic level control for adding antifoam (optional)				
	Others	pCO ₂ electrode (optional), cell density electrode (optional), conductance (optional), Raman electrode (optional), etc.				
Gas control	Ventilation mode	Surface ventilation/deep ventilation				
	Gas type	Air, O ₂ , CO ₂ , N ₂				
	Control method	0-6 channel mass flow meter (MFC) /0-4 channel rotameter				
	Gas distributor	L-shaped bubble/annular bubble/microbubble (5-200 um)				
	Tail gas	Stainless steel condensing reflow (optional)				
Peristaltic pump	Peristaltic pump	2-4 variable speed pumps				
	Speed	0.1-300 rpm				
	Reserve external pump port	0-2 variable speed pumps (optional)				
Temperature	Control method	Electric heating blanket (Single-wall vessel)/TCU heating (jacketed vessel)				
Weighing	Reserve external weight port	0-4 variable speed weights (optional)				
Control system	Controller	Industrial PLC				
	Interface	23" PC				
	Compliance	Conforming to 21 CFR PART 11				
Integrity test	Integrity tester	Detection range: 0-350 mbar (optional)				

Ordering Information

1 L benchtop glass bioreactor

1 L benchtop glass bioreactor	Cat No.	Specification
Glass reactor		
1 L glass reactor, single-wall (bracket, glass reaction vessel, stainless steel roof and bracket)	CGB01LGS-001	1 L
1 L glass reactor, jacket (bracket, glass reaction vessel, stainless steel roof and bracket)	CGB01LGJ-001	1 L
1 L single-wall glass reactor	CGB01LVS-001	1 L
1 L jacketed glass reactor	CGB01LVJ-001	1 L
1 L single-wall, jacketed universal stainless steel roof	CGB01LSR-001	1 L
1 L single-wall stainless steel bracket	CGB01LSR-002	1 L
1 L jacketed stainless steel bracket	CGB01LSR-015	1 L
Stir		
1 L mixing assembly	CGB01LSR-003	OD: M30
1 L marine mixing paddle	CGB01LSR-004	OD: 38 mm
1 L flat blade turbine mixing paddle	CGB01LSR-005	OD: 38 mm
1 L baffle	CGB01LSR-006	OD: 6 mm
Gas		
1 L bottom intake tube (large bubble)	CGB01LSR-007	OD: 10 mm
1 L annular bottom intake tube (large bubble)	CGB01LSR-013	OD: 10 mm
1-20 L surface ventilation assembly	CGB01-20LSR-001	OD: 10 mm
Sensors and related accessories		
1 L Hamilton ARC pH sensor	CGB01LER-001	160 mm long
1 L Hamilton ARC DO sensor	CGB01LER-002	160 mm long
1-20 L Pt100 temperature sensor	CGB01-20LER-002	200 mm long
1 L liquid level/foam sensor	CGB01LER-006	OD: 10 mm
1 L stainless steel temperature casing	CGB01LSR-009	OD: 10 mm
1-7 L electrode adapter	CGB01-07LSR-002	OD: M18*1.5
Tail gas		
1-7 L condensation reflux	CGB01-07LSR-001	OD: M18*1.5

1 L benchtop glass bioreactor	Cat No.	Specification
Cooler		
1 L heat exchange tube	CGB01LSR-014	OD: 10 mm
Feed and sampling line		
1-7 L three-inlet components	CGB01-07LSR-004	OD: M18*1.5
1-20 L 10-mm feed tube	CGB01-20LSR-002	OD: 10 mm
1-20 L 12-mm feed tube	CGB01-20LSR-003	OD: 12 mm
1 L harvest tube	CGB01LSR-010	OD: 10 mm
1 L sampling tube	CGB01LSR-011	OD: 10 mm
Plug		
1-7 L M18*1.5 plug	CGB01-07LSR-003	OD: M18*1.5
1-20 L 10-mm plug	CGB01-20LSR-004	OD: 10 mm
1-20 L 12-mm plug	CGB01-20LSR-005	OD: 12 mm
1 L 6-mm plug	CGB01LSR-012	OD: 6 mm
1-20 L electrode plug	CGB01-20LSR-006	Thread: PG13.5
Heated blanket		
1 L heated blanket	CGB01LER-004	1 L: 360*100, 230 V, 80 W

3 L benchtop bioreactor

3 L benchtop bioreactor	Cat No.	Specification
Glass reactor		
3 L glass reactor, single-wall (bracket, glass reaction vessel, stainless steel roof and bracket)	CGB03LGS-001	3 L
3 L glass reactor, jacket (bracket, glass reaction vessel, stainless steel roof and bracket)	CGB03LGJ-001	3 L
3 L single-wall glass reactor	CGB03LV5-001	3 L
3 L jacketed glass reactor	CGB03LVJ-001	3 L
3 L single-wall, jacketed universal stainless steel roof	CGB03LSR-001	3 L
3 L single-wall stainless steel bracket	CGB03LSR-002	3 L
3 L jacketed stainless steel bracket	CGB03LSR-004	3 L
Stir		
3 L mixing assembly	CGB03LSR-005	OD: M30
3 L marine mixing paddle	CGB03LSR-006	OD: 45 mm
3 L flat blade turbine mixing paddle	CGB03LSR-007	OD: 45 mm
3 L baffle	CGB03LSR-008	OD: 10 mm
Gas		
3 L bottom intake tube (large bubble)	CGB03LSR-009	OD: 10 mm
3 L bottom intake tube (microbubble)	CGB03LSR-010	OD: 10 mm
3 L annular bottom intake tube (large bubble)	CGB03LSR-015	OD: 10 mm
1-20 L surface ventilation assembly	CGB01-20LSR-001	OD: 10 mm
1-7 L microbubble tip, 20 µm	CGB01-07LSR-006	
1-7 L microbubble tip, other pore size	Customized	
Sensors and related accessories		
3 L Hamilton ARC pH sensor	CGB03LER-001	225 mm long
3 L Hamilton ARC DO sensor	CGB03LER-002	225 mm long
1-20 L Pt100 temperature sensor	CGB01-20LER-002	200 mm long
3 L liquid level/foam sensor	CGB03LER-005	OD: 10 mm
1-7 L electrode adapter	CGB01-07LSR-002	OD: M18*1.5
3 L stainless steel temperature casing	CGB03LSR-011	OD: 10 mm

3 L benchtop bioreactor	Cat No.	Specification
Tail gas		
1-7 L condensation reflux	CGB01-07LSR-001	OD: M18*1.5
Cooler		
3 L heat exchange tube	CGB03LSR-012	OD: 10 mm
Feed and sampling line		
1-7 L three-inlet components	CGB01-07LSR-004	OD: M18*1.5
1-20 L 10-mm feed tube	CGB01-20LSR-002	OD: 10 mm
1-20 L 12-mm feed tube	CGB01-20LSR-003	OD: 12 mm
3 L harvest tube	CGB03LSR-013	OD: 10 mm
3 L sampling tube	CGB03LSR-014	OD: 10 mm
Plug		
1-7 L M18*1.5 plug	CGB01-07LSR-003	OD: M18*1.5
1-20 L 10-mm plug	CGB01-20LSR-004	OD: 10 mm
1-20 L 12-mm plug	CGB01-20LSR-005	OD: 12 mm
1-20 L electrode plug	CGB01-20LSR-006	Thread: PG13.5
Heated blanket		
3 L heated blanket	CGB03LER-004	3 L: 485*180, 230 V, 100 W

7 L benchtop bioreactor

7 L benchtop bioreactor	Cat No.	Specification
Glass reactor		
7 L glass reactor, single-wall (bracket, glass reaction vessel, stainless steel roof and bracket)	CGB07LGS-001	7 L
7 L glass reactor, jacket (bracket, glass reaction vessel, stainless steel roof and bracket)	CGB07LGJ-001	7 L
7 L single-wall glass reactor	CGB07LVS-001	7 L
7 L jacketed glass reactor	CGB07LVJ-001	7 L
7 L single-wall, jacketed universal stainless steel roof	CGB07LSR-001	7 L
7 L single-wall stainless steel bracket	CGB07LSR-002	7 L
7 L jacketed stainless steel bracket	CGB07LSR-004	7 L
Stir		
7 L mixing assembly	CGB07LSR-005	OD: M30
7 L marine mixing paddle	CGB07LSR-006	OD: 60 mm
7 L flat blade turbine mixing paddle	CGB07LSR-007	OD: 60 mm
7 L baffle	CGB07LSR-008	OD: 10 mm
Gas		
7 L bottom intake tube (large bubble)	CGB07LSR-009	OD: 10 mm
7 L bottom intake tube (microbubble)	CGB07LSR-010	OD: 10 mm
7 L annular bottom intake tube (large bubble)	CGB07LSR-015	OD: 10 mm
1-20 L surface ventilation assembly	CGB01-20LSR-001	OD: 10 mm
1-7 L microbubble tip, 20 µm	CGB01-07LSR-006	
1-7 L microbubble tip, other pore size	Customized	
Sensors and related accessories		
7 L Hamilton ARC pH sensor	CGB07LER-001	325 mm long
7 L Hamilton ARC DO sensor	CGB07LER-002	325 mm long
1-20 L Pt100 temperature sensor	CGB01-20LER-002	200 mm long
7 L liquid level/foam sensor	CGB07LER-005	OD: 10 mm
1-7 L electrode adapter	CGB01-07LSR-002	OD: M18*1.5
7 L stainless steel temperature casing	CGB07LSR-011	OD: 10 mm

7 L benchtop bioreactor	Cat No.	Specification
Tail gas		
1-7 L condensation reflux	CGB01-07LSR-001	OD: M18*1.5
Cooler		
7 L heat exchange tube	CGB07LSR-012	OD: 10 mm
Feed and sampling line		
1-7 L three-inlet components	CGB01-07LSR-004	OD: M18*1.5
1-20 L 10-mm feed tube	CGB01-20LSR-002	OD: 10 mm
1-20 L 12-mm feed tube	CGB01-20LSR-003	OD: 12 mm
7 L harvest tube	CGB07LSR-013	OD: 10 mm
7 L sampling tube	CGB07LSR-014	OD: 10 mm
Plug		
1-7 L M18*1.5 plug	CGB01-07LSR-003	OD: M18*1.5
1-20 L 10-mm plug	CGB01-20LSR-004	OD: 10 mm
1-20 L 12-mm plug	CGB01-20LSR-005	OD: 12 mm
1-20 L electrode plug	CGB01-20LSR-006	Thread: PG13.5
Heated blanket		
7 L heated blanket	CGB07LER-004	7 L: 575*165, 230 V, 178 W

15 L benchtop bioreactor

15 L benchtop bioreactor	Cat No.	Specification
Glass reactor		
15 L glass reactor, single-wall (bracket, glass reaction vessel, stainless steel roof and bracket)	CGB15LGS-001	15 L
15 L glass reactor, jacket (bracket, glass reaction vessel, stainless steel roof and bracket)	CGB15LGJ-001	15 L
15 L single-wall glass reactor	CGB15LVS-001	15 L
15 L jacketed glass reactor	CGB15LVJ-001	15 L
15 L&20 L single-wall, jacketed universal stainless steel roofs	CGB15&20LSR-008	15 L
15 L single-wall stainless steel bracket	CGB15LSR-002	15 L
15 L jacketed stainless steel bracket	CGB15LSR-004	15 L
Stir		
15 L mixing assembly	CGB15LSR-005	OD: 69 mm
15&20 L marine mixing paddles	CGB15&20LSR-004	OD: 74 mm
15&20 L flat blade turbine mixing paddle	CGB15&20LSR-005	OD: 75 mm
15 L baffle	CGB15LSR-006	OD: 10 mm
Gas		
15 L bottom intake tube (large bubble)	CGB15LSR-007	OD: 10 mm
15 L bottom intake tube (microbubble)	CGB15LSR-008	OD: 10 mm
15 L annular bottom intake tube (large bubble)	CGB15LSR-013	OD: 10 mm
1-20 L surface ventilation assembly	CGB01-20LSR-001	OD: 10 mm
15&20 L microbubble tips, 20 um	CGB15&20LSR-009	
15&20 L microbubble tips, other pore size	Customized	
Sensors and related accessories		
15&20 L Hamilton ARC pH sensors	CGB15&20LER-001	425 mm long
15&20 L Hamilton ARC DO sensors	CGB15&20LER-002	425 mm long
1-20 L Pt100 temperature sensor	CGB01-20LER-002	200 mm long
15&20 L liquid level/foam sensors	CGB15&20LER-004	OD: 10 mm
15&20 L electrode adapters	CGB15&20LSR-002	OD: 27 mm
15 L stainless steel temperature casing	CGB15LSR-009	OD: 10 mm

15 L benchtop bioreactor	Cat No.	Specification
Tail gas		
15&20 L condensation reflux	CGB15&20LSR-001	OD: 27 mm
Cooler		
15 L heat exchange tube	CGB15LSR-010	OD: 10 mm
Feed and sampling line		
15&20 L three-inlet components	CGB15&20LSR-003	OD: 27 mm
1-20 L 10-mm feed tube	CGB01-20LSR-002	OD: 10 mm
1-20 L 12-mm feed tube	CGB01-20LSR-003	OD: 12 mm
15 L harvest tube	CGB15LSR-011	OD: 10 mm
15 L sampling tube	CGB15LSR-012	OD: 10 mm
Plug		
15 L&20 L 27-mm plug	CGB15&20LSR-006	OD: 27 mm
1-20 L 10-mm plug	CGB01-20LSR-004	OD: 10 mm
1-20 L 12-mm plug	CGB01-20LSR-005	OD: 12 mm
1-20 L electrode plug	CGB01-20LSR-006	Thread: PG13.5
Heated blanket		
15 L&20 L heated blankets	CGB015&20LER-004	15 L&20 L: 760*200, 230 V, 383 W

20 L benchtop bioreactor

20 L benchtop bioreactor	Cat No.	Specification
Glass reactor		
20 L glass reactor, single-wall (bracket, glass reaction vessel, stainless steel roof and bracket)	CGB20LGS-001	20 L
20 L single-wall glass reactor	CGB20LVS-001	20 L
15 L&20 L single-wall, jacketed universal stainless steel roofs	CGB15&20LSR-008	20 L
20 L single-wall stainless steel bracket	CGB20LSR-002	20 L
Stir		
20 L mixing assembly	CGB20LSR-003	OD: 69 mm
15&20 L marine mixing paddles	CGB15&20LSR-004	OD: 74 mm
15&20 L flat blade turbine mixing paddle	CGB15&20LSR-005	OD: 75 mm
20 L baffle	CGB20LSR-004	OD: 10 mm
Gas		
20 L bottom intake tube (large bubble)	CGB20LSR-005	OD: 10 mm
20 L bottom intake tube (microbubble)	CGB20LSR-006	OD: 10 mm
20 L annular bottom intake tube (large bubble)	CGB20LSR-011	OD: 10 mm
1-20 L surface ventilation assembly	CGB01-20LSR-001	OD: 10 mm
15&20 L microbubble tips, 20 µm	CGB15&20LSR-009	
15&20 L microbubble tips, other pore size	Customized	
Sensors and related accessories		
15&20 L Hamilton ARC pH sensors	CGB15&20LER-001	425 mm long
15&20 L Hamilton ARC DO sensors	CGB15&20LER-002	425 mm long
1-20 L Pt100 temperature sensor	CGB01-20LER-002	200 mm long
15&20 L liquid level/foam sensors	CGB15&20LER-004	OD: 10 mm
15&20 L electrode adapters	CGB15&20LSR-002	OD: 27 mm
20 L stainless steel temperature casing	CGB20LSR-007	OD: 10 mm
Tail gas		
15&20 L condensation reflux	CGB15&20LSR-001	OD: 27 mm
Cooler		
20 L heat exchange tube	CGB20LSR-008	OD: 10 mm

20 L benchtop bioreactor	Cat No.	Specification
Feed and sampling line		
15&20 L three-inlet components	CGB15&20LSR-003	OD: 27 mm
1-20 L 10-mm feed tube	CGB01-20LSR-002	OD: 10 mm
1-20 L 12-mm feed tube	CGB01-20LSR-003	OD: 12 mm
20 L harvest tube	CGB20LSR-009	OD: 10 mm
20 L sampling tube	CGB20LSR-010	OD: 10 mm
Plug		
15&20 L 27-mm plug	CGB15&20LSR-006	OD: 27 mm
1-20 L 10-mm plug	CGB01-20LSR-004	OD: 10 mm
1-20 L 12-mm plug	CGB01-20LSR-005	OD: 12 mm
1-20 L electrode plug	CGB01-20LSR-006	Thread: PG13.5
Heated blanket		
15&20 L heated blankets	CGB015&20LER-004	15 L&20 L: 760*200, 230 V, 383 W

Supporting device	Cat No.	Specification
Integrity tester	CGB01-20LIT-001	Suitable for 1-20 L vessels
TCU	CGB01-20LTC-001	Suitable for 1-15 L jacketed vessel and benchtop mixing

www.biolink.com



About BioLink

BioLink is a group of technology-driven businesses that provide process solutions in the life sciences industry. The company focuses on the development and production of the key processing equipment and consumables used in the manufacturing process of recombinant protein drugs, vaccines, antibodies, cell therapies, gene therapies, and other biological products. BioLink's portfolio of offerings covers the entire upstream and downstream bioprocess such as cell culture, single-use mixing and storage, chromatography, filtration (ultrafiltration/diafiltration, clarification, and virus removal), and hydration products, as well as process development services. BioLink is committed to providing customers with high-quality, innovative products and solutions and strives to build an efficient, safe and competitive biopharmaceutical supply chain eco-system.

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