BIOSTAT STR® Generation 3 Bioreactors and Flexsafe STR® Bags

Engineered for Ultimate Upstream Performance

Benefits

- Optimize capital costs
- Reduce operating expenses
- Enhanced safety and optimized space
- Improve productivity and ease of use
- Flexible configurations and simplified maintainance
- Increase speed to clinic

Product Information

BIOSTAT STR® hardware, software, and consumables comprise a state-of-the-art single use biomanufacturing platform that delivers exceptional performance to meet your process development and commercial manufacturing needs. BIOSTAT STR® bioreactors and Flexsafe STR® bags range in size from 50L to 2000L and are engineered to maximize the flexibility and scalability of your operations. This next generation of our BIOSTAT STR® system is engineered for quality, precision and seamless scalability so that you can accelerate your success with a stable process that delivers a safe, reliable biologic medicine for patients around the world.

Technical Specifications

Bag Holder with TCU

	BIOSTAT STR® 50	BIOSTAT STR® 200	BIOSTAT STR® 500	BIOSTAT STR® 1000	BIOSTAT STR® 2000
Material			AISI 304L stainless steel		
Dimensions W × D × H	788 × 1061 × 1952 mm 31 × 47.8 × 77 in.	788 × 1291 × 1978 mm 31 × 50.8 × 78 in.	1032 × 1614 × 2312 mm 40.7 × 63.5 × 91 in.	1225 × 1664 × 2692 mm 48.2 × 65.5 × 106 in.	3308 × 2722 × 3894 mm 130.2 × 107.2 × 153.3 in. (incl.platform)
Footprint	0.84 m² 9.04 ft²	1.02 m² 10.98 ft²	1.67 m² 17.98 ft²	2.04 m² 21.96 ft²	9 m² 96.88 ft² (incl.platform)
Weight	315 kg 695 lb	410 kg 904 lb	700 kg 1,543 lb	875 kg 1,929 lb	2,045 kg 4,509 lb (incl.platform)
Packaging dimensions	1450 × 1150 × 2200 mm 57.1 × 45.3 × 82.7 in.	1450 × 1150 × 2200 mm 57.1 × 45.3 × 82.7 in.	1800 × 1200 × 2400 mm 70.9 × 47.2 × 94.5 in.	1800 × 1500 × 2600 mm 70.9 × 59 × 102.4 in.	
Installed on skid	☐	☐	☐	☐	☐
Double wall	☐	☐	☐	☐	☐
Electro-polished	☐	☐	☐	☐	☐
Single front door	☐	☐	☐	☐	☐
Holder for gas filters	☐	☐	☐	☐	☐
Viewing window	1	1	1	1	1
Lateral window for sensors and ports	2	2	2	2	2
Top drive motor	☐	☐	☐	☐	☐

☐ available   – not available   (☐) optional, needs to be ordered separately

BIOSTAT STR® 50   BIOSTAT STR® 200   BIOSTAT STR® 500   BIOSTAT STR® 1000   BIOSTAT STR® 2000

Control Tower

Specifications for all BIOSTAT STR® models and sizes

Material	AISI 304 stainless steel
Dimensions (W × D × H)	800 × 850 × 1820 mm | 31.5 × 33.5 × 71.7 in.
Footprint	0.68 m² | 7.32 ft²
Weight	240 kg | 529 lb
Packaging dimension	1000 × 1050 × 2100 mm | 39.4 × 41.3 × 82.7 in.
Single version	☐
Installed on skid	☐
Color touch screen	22″
Safety measurement and shut-off	☐
Different user level log in	(☐)
Audit Trail function	(☐)

Facility and Utility Requirements

	BIOSTAT STR® 50	BIOSTAT STR® 200	BIOSTAT STR® 500	BIOSTAT STR® 1000	BIOSTAT STR® 2000
Power Supply Power | Frequency | Consumption					
208 VAC | 60 Hz | 23 A	☐	☐	☐	☐	☐
400 VAC | 50 Hz | 18 A	☐	☐	☐	☐	☐
Gas Supply	Gas specification according to ISO 8573-1: dry, free of oil and dust				
Compressed air (bar)	2	2	2	4	4
Gas pressure O_2, N_2, CO_2 (bar)	2	2	2	4	4
Water Supply					
Cooling water – supply pressure (bar)	1.5	1.5	1.5	1.5	2
Drain for water	25 lpm	25 lpm	25 lpm	25 lpm	40 lpm
Temperature	min. 8°C min. 46°F	min. 8°C min. 46°F	min. 8°C min. 46°F	min. 8°C min. 46°F	min. 8°C min. 46°F
Degree of hardness	max. 12 dH	max. 12 dH	max. 12 dH	max. 12 dH	max. 12 dH
Environmental Requirements					
Ambient temperature	5 – 40°C 41 – 104°F				
Relative humidity range	< 85%				

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Process Control

	BIOSTAT STR® 50	BIOSTAT STR® 200	BIOSTAT STR® 500	BIOSTAT STR® 1000	BIOSTAT STR® 2000
Agitation Module					
Max. stirrer speed*	240 rpm	150 rpm	110 rpm	90 rpm*	70 rpm
Temperature Control Unit					
Type	Heating | cooling	Heating | cooling	Heating | cooling	Heating | cooling	Heating | cooling
Heating kW | cooling HP					
Temperature control, double wall	8°C (46°F) above cooling water up to 40°C (104°F)	8°C (46°F) above cooling water up to 40°C (104°F)	8°C (46°F) above cooling water up to 40°C (104°F)	8°C (46°F) above cooling water up to 40°C (104°F)	8°C (46°F) above cooling water up to 40°C (104°F)
Over-temperature protection	☐	☐	☐	☐	☐
Connection to pressure rated cooling water up to 6 bar	☐	☐	☐	☐	☐
Aeration Module	4-gas mix (O_2, N_2, CO_2, air) with 3 outlets				
Mass Flow Controllers (MFC)					
▪ Number of MFCs	6	6	6	6	6
▪ Accuracy of MFC	± 1% full-scale	± 1% full-scale	± 1% full-scale	± 1% full-scale	± 1% full-scale
For sparger line	Ring sparger, micro- or combi-sparger (O_2, N_2, CO_2, air)				
▪ Flow rates (lpm)**	(0.025 – 5)	(0.1 – 20)	(0.25 – 50)	(0.5 – 100)	(1.0 – 200)
For overlay line	(CO_2, air)				
▪ Flow rates (lpm)**	(0.025 – 5)	(0.1 – 20)	(0.25 – 50)	(0.5 – 100)	(1.0 – 200)
Softkey to switch air | O_2 between ring and micro-sparger	☐	☐	☐	☐	☐
Advanced DO controller	☐	☐	☐	☐	☐
max. gassing rate	0.1 vvm for micro sparger				
max. total gassing rate	0.2 vvvm for all STR sizes				
Pump Module					
Max. 3 internal pumps installed					
WM314 speed-controlled	1	1	1	1	1
WM314 fixed speed	2	2	2	2	2
External Pumps					
Speed-controlled	(up to 5)	(up to 5)	(up to 5)	(up to 5)	(up to 5)

* Valid for 2 × 3-blade impellers. In case of 1 × 3-blade and 1 × 6-blade impellers, the maximum stirrer speed may be reduced depending on the filling level.
  At maximum filling level, the stirrer speed is limited to 70 rpm at 1,000 L scale.
** Alternative lower flow ranges are available upon request.

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Process Control Continued

	BIOSTAT STR® 50	BIOSTAT STR® 200	BIOSTAT STR® 500	BIOSTAT STR® 1000	BIOSTAT STR® 2000
Sensors & Measurement					
Temperature probe Pt 100	☐	☐	☐	☐	☐
▪ Measurement range	0 – 150°C 32 – 302°F	0 – 150°C 32 – 302°F	0 – 150°C 32 – 302°F	0 – 150°C 32 – 302°F	0 – 150°C 32 – 302°F
pH, single-use	☐	☐	☐	☐	☐
▪ Measurement range	6.0 – 8.0	6.0 – 8.0	6.0 – 8.0	6.0 – 8.0	6.0 – 8.0
▪ Recalibration function	☐	☐	☐	☐	☐
pH, electro-chemical, multi-use and single-use	☐	☐	☐	☐	☐
▪ Measurement range	4 – 10	4 – 10	4 – 10	4 – 10	4 – 10
DO, single-use	☐	☐	☐	☐	☐
▪ Measurement range	0 – 110%	0 – 110%	0 – 110%	0 – 110%	0 – 110%
▪ Recalibration function	☐	☐	☐	☐	☐
DO optical or polarographic, reusable	☐	☐	☐	☐	☐
▪ Measurement range	0 – 100%	0 – 100%	0 – 100%	0 – 100%	0 – 100%
Load cells	☐	☐	☐	☐	☐
Balance substrate	(up to 4)	(up to 4)	(up to 4)	(up to 4)	(up to 4)
BioPAT® ViaMass	☐	☐	☐	☐	☐
BioPAT® Trace (Glucose | Lactate sensor)	☐	☐	☐	☐	☐
▪ Accuracy	0.1 g/L	0.1 g/L	0.1 g/L	0.1 g/L	0.1 g/L
Accessories					
Ladder	Platform	–	–	(☐)	(☐)	(☐)
Filter line IN	☐	☐	☐	☐	☐
Filter line OUT	☐	☐	☐	☐	☐
SU exhaust cooler	(☐)	(☐)	(☐)	(☐)	–
Holder for conventional probes	(☐)	(☐)	(☐)	(☐)	(☐)

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Communication | Interface of Control Tower

	BIOSTAT STR® 50	BIOSTAT STR® 200	BIOSTAT STR® 500	BIOSTAT STR® 1000	BIOSTAT STR® 2000
OPC UA	□	□	□	□	□
OPC DA (convertor)	(□)	(□)	(□)	(□)	(□)
RS232	up to 4	up to 4	4	4	5
Industrial Ethernet	□	□	□	□	□
Analog IN	4	4	4	4	4
Analog OUT	4	4	4	4	4
DeltaV™ connectivity	(□)	(□)	(□)	(□)	(□)
RemoteIO connectivity (on request)	(□)	(□)	(□)	(□)	(□)
native DetlaV™ solution (on request)	(□)	(□)	(□)	(□)	(□)

□ available   – not available   (□) optional, needs to be ordered separately

Flexsafe STR® Bags

Geometrical Data of Flexsafe STR® Bags

Flexsafe STR®	50 L	200 L	500 L	1,000 L	2,000 L
Total volume [L]	68	280	700	1,300	2,800
Max. working volume [L]	50	200	500	1,000	2,000
Min. working volume [L]	12.5	50	125	250	500
Turndown ratio	1 : 4	1 : 4	1 : 4	1 : 4	1 : 4
Bag diameter, d_1 [mm]	370	585	815	997	1,295
Bag height, h_1 [mm]	666	1,055	1,467	1,800	2,330
Ratio, h_1/d_1	1.8	1.8	1.8	1.8	1.8
Liquid height, h_2 [mm]	480	783	1,005	1,360	1,670
Ratio, h_2/d_1	1.3	1.34	1.23	1.36	1.29
Impeller diameter, d_2 [mm]	143	225	310	379	492
Ratio, d_2/d_1	0.38	0.38	0.38	0.38	0.38
Distance between impellers [mm]	186	300	403	493	640
Volume bottom impeller, fully immersed V_1 [L]	12.5	50	125	250	395
Volume top impeller does not touches surface V_2 [L]	23	95	247	450	953
Volume top impeller, fully immersed V_3 [L]*	31	125	327	597	1,266
Bag packaging dimensions W × D × H (mm | in.)	395 × 395 × 1170 | 15.5 × 15.5 × 46	395 × 595 × 1440 | 15.5 × 23.4 × 56.7	764 × 1153 × 1320 | 30.1 × 45.4 × 52	764 × 1153 × 1440 | 30.1 × 45.4 × 56.7	995 × 1195 × 1715 | 39.2 × 47 × 67.5

* Volume variied depending on the bag configuration (e.g. impeller and sparger configuration).

Example of Flexsafe STR® 200 L Basic Configuration

Pos.	Designation	Tubing Material	Tubing Termination	Remarks
A	Overlay aeration	Si(Pt)	Opta connector	Without spare port
B	Substrate line 1	Si - TPE	MPC quick coupling	
C	Substrate line 2	Si - TPE	MPC quick coupling	
D	Sparger aeration	Si(Pt)	Opta connector	Without spare port
E	Substrate 3 – 4	Si - TPE, C-Flex®*	MPC quick coupling	2 lines via Y, dip tube
F	Base addition	Si - TPE, C-Flex®*	Clave connector	
G	Antifoam addition	Si - TPE, C-Flex®*	Clave connector	
H	Gas out (exhaust)	ID, Si(Pt)	Opta connector	2 lines via Y
I	Temperature sensor	Si(Pt)	N/A	Reusable sensor (Pt100)
J | K	DO | pH Sensor	N/A	N/A	Optical sensor
L	Small-volume sampling	Si - TPE, Si(Pt)	Clave connector	
M	Bottom-drain harvest	Si - TPE, C-Flex®*	MPC quick coupling	

* C-Flex® is a registered trademark of Saint-Gobain Performance Plastics Corporation.

Ordering Information

Description	Order No.
BIOSTAT STR® Bioreactor System	
System will be configured according to process requirements based on broad choice of configuration options. Please contact your sales representative.	
Flexsafe STR® Single-use Bioreactor Bag	
Standard Design	
Flexsafe STR® 50 L	FRS132668
Flexsafe STR® 200 L	FRS132670
Flexsafe STR® 500 L	FRS124057
Flexsafe STR® 1,000 L	FRS124058
Flexsafe STR® 2,000 L	FRS132367
Customer-specific designs: Please contact your sales representative.	
Bag Tester Fleece	
For 50 L STR®	DZ050L-S2SIT
For 200 L STR®	DZ200L-S2SIT
For 500 L STR®	DZ500L-S2SIT
For 1,000 L STR®	DZ001K-S2SIT
For 2,000 L STR®	DZ002K-S2SIT

Description	Order No.
Accessories	
Filter line IN 50 | 200 L	DS200L-SBFLI
Filter line OUT 50 | 200 L	DS200L-SBFLO
Filter line IN 500 |1,000 L	DS001K-SBFLI
Filter line OUT 500 |1,000 L	DS001K-SBFLO
Filter line IN 2,000 L	DS002K-SBFLI
Filter line OUT 2,000 L	DS002K-SBFLO
Lab Cart	1ZG—0032
Lifting device & adapter (STR® 2,000)	2ZG—0009
BIOSTAT STR® ViaMass Support 60mm	DZ------AD1
BIOSTAT STR® ViaMass Support 100mm	DZ------AD2
Autoclave tray for re-usable probes	1ZG—0034
Single-Use Exhaust Cooler	
SU exhaust cooler STR® 50 | 200	DS200L—EC
SU exhaust cooler STR® 500 |1,000	DS001K—EC

Sales and Service Contacts

For further contacts, visit sartorius.com