

# Biostat STR<sup>®</sup> Generation 3 Bioreactors and Flexsafe STR<sup>®</sup> Bags

Engineered for Ultimate  
Upstream Performance

## Benefits

- Stay flexible and optimize space
- Improve productivity and ease of use
- Simplify set-up for process intensification
- Increase speed to clinic and market
- Optimize capital costs
- Achieve superior process control

## Product Information

Biostat STR<sup>®</sup> 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<sup>®</sup> bioreactors and Flexsafe STR<sup>®</sup> bags range in size from 50 L to 2,000 L and are engineered to maximize the flexibility and scalability of your operations. This next generation of our Biostat STR<sup>®</sup> system is engineered for quality, precision, and seamless scalability so you can accelerate your success with a stable process that delivers a safe and 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	815 × 1061 × 1951 mm 32 × 47.8 × 77 in	815 × 1291 × 1977 mm 32 × 50.8 × 78 in	1058 × 1614 × 2308 mm 41.7 × 63.5 × 91 in	1250 × 1664 × 2689 mm 49.2 × 65.5 × 106 in	3460 × 2676 × 3762 mm 136.2 × 105.4 × 148.1 in (incl. platform)
Footprint	0.86 m <sup>2</sup> 9.26 ft <sup>2</sup>	1.05 m <sup>2</sup> 11.3 ft <sup>2</sup>	1.71 m <sup>2</sup> 18.41 ft <sup>2</sup>	2.08 m <sup>2</sup> 22.4 ft <sup>2</sup>	9.3 m <sup>2</sup> 100.1 ft <sup>2</sup> (incl. platform)
Weight	325 kg 716.5 lb	445 kg 981.1 lb	700 kg 1,543 lb	875 kg 1,929 lb	2,300 kg 5,070.6 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	■	■	■	■	■
Integrated XCell™ Technology	□	□	□	□	□
Dimensions with integrated XCell™ Technology W × D × H	1045 × 1061 × 1951 mm 41.1 × 41.8 × 76.8 in	1054 × 1291 × 1977 mm 41.5 × 50.8 × 77.8 in	1253 × 1614 × 2308 mm 49.3 × 63.5 × 90.9 in	1446 × 1664 × 2689 mm 56.9 × 65.5 × 105.9 in.	3460 × 2757 × 3762 mm 136.2 × 108.5 × 148.1 in. (incl. platform)

■ 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 m <sup>2</sup>   7.32 ft <sup>2</sup>
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 Login	□
Standalone GMP Functionality	■

### Facility and Utility Requirements

	Biostat STR® 50	Biostat STR® 200	Biostat STR® 500	Biostat STR® 1000	Biostat STR® 2000
<b>Power Supply</b>					
Power   Frequency   Consumption					
208 VAC   60 Hz   23 A	■	■	■	■	■
400 VAC   50 Hz   18 A	■	■	■	■	■
<b>Gas Supply</b>					
Gas specification according to ISO 8573-1: dry, free of oil and dust					
Compressed Air (bar)	2	2	2	4	4
Gas Pressure O <sub>2</sub> , N <sub>2</sub> , CO <sub>2</sub> (bar)	2	2	2	4	4
<b>Water Supply</b>					
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
<b>Environmental Requirements</b>					
Ambient Temperature	5 – 40 °C 41 – 104 °F				
Relative Humidity Range	< 85%				

■ Available      – Not available      □ Optional, needs to be ordered separately

## Process Control

	Biostat STR® 50	Biostat STR® 200	Biostat STR® 500	Biostat STR® 1000	Biostat STR® 2000
<b>Agitation Module</b>					
Max. Stirrer Speed <sup>1</sup>	240 rpm	150 rpm	110 rpm	90 rpm <sup>2</sup>	70 rpm
<b>Temperature Control Unit</b>					
Type	Heating   Cooling	Heating   Cooling	Heating   Cooling	Heating   Cooling	Heating   Cooling
<b>Heating kW   Cooling HP</b>					
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	■	■	■	■	■
<b>Aeration Module</b>					
	Four-gas mix (O <sub>2</sub> , N <sub>2</sub> , CO <sub>2</sub> , air) with three outlets				
<b>Mass Flow Controllers (MFC)</b>					
■ 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 <sub>2</sub> , N <sub>2</sub> , CO <sub>2</sub> , air)				
■ Flow Rates (lpm) <sup>3</sup>	(0.025 – 5)	(0.1 – 20)	(0.25 – 50)	(0.5 – 100)	(1.0 – 200)
For Overlay Line	(CO <sub>2</sub> , air)				
■ Flow Rates (lpm) <sup>3</sup>	(0.025 – 5)	(0.1 – 20)	(0.25 – 50)	(0.5 – 100)	(1.0 – 200)
Softkey to Switch Air   O <sub>2</sub> Between Ring and Micro-Sparger	■	■	■	■	■
Advanced DO Controller	■	■	■	■	■
Max. Gassing Rate	0.1 vvm for micro sparger				
Max. Total Gassing Rate	0.2 vvm for all STR sizes				
<b>Pump Module</b>					
Three Internal Pumps Installed					
WM314 Speed-Controlled	1	1	1	1	1
WM314 Fixed-Speed	2	2	2	2	2
<b>External Pumps</b>					
At the Tower Speed-Controlled	(up to 5)	(up to 5)	(up to 5)	(up to 5)	(up to 5)
At Media Control Hub	(up to 8)	(up to 8)	(up to 8)	(up to 8)	(up to 8)

<sup>1</sup> 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.

<sup>2</sup> At maximum filling level, the stirrer speed is limited to 70 rpm at 1,000 L scale.

<sup>3</sup> Alternative lower flow ranges are available upon request.

■ Available      – Not available      □ Optional, needs to be ordered separately

## Process Control (continued)

	Biostat STR® 50	Biostat STR® 200	Biostat STR® 500	Biostat STR® 1000	Biostat STR® 2000
<b>Sensors and Measurement</b>					
Temperature Probe Pt100	■	■	■	■	■
■ 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, Multiuse 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	■	■	■	■	■
■ Automated Feed and Bleed Control <sup>4</sup>	□	□	□	□	□
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
<b>Accessories</b>					
Media Control Hub	□	□	□	□	□
Ladder   Platform	–	–	□	□	□
Filter Line IN	■	■	■	■	■
Filter Line OUT	■	■	■	■	■
SU Exhaust Cooler	□	□	□	□	–
Holder for Conventional Probes	□	□	□	□	□

<sup>4</sup> Available only with integrated XCell™ Technology

■ Available      – Not available      □ Optional, needs to be ordered separately

## Communication | Control Tower Interface

	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

■ 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 Touch 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 $W \times D \times H$ (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 varies depending on the bag configuration (e.g., impeller and sparger configuration).

### Example of Flexsafe STR® 200 L Basic Configuration

Position	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	Two 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	Two lines via Y
I	Temperature sensor	Si(Pt)	N/A	Reusable sensor (Pt100)
J	DO sensor	N/A	N/A	Optical single-use sensor
K	pH sensor	N/A	N/A	Electrochemical single-use 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.
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## 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	FRS304383
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Flexsafe STR® 200 L	FRS304384
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Flexsafe STR® 500 L	FRS304385
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Flexsafe STR® 1,000 L	FRS304386
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Flexsafe STR® 2,000 L	FRS304387
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Customer-specific designs: please contact your sales representative.

## Bag Tester Fleece

For 50 L STR®	DZ050L-S2SIT
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For 200 L STR®	DZ200L-S2SIT
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For 500 L STR®	DZ500L-S2SIT
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For 1,000 L STR®	DZ001K-S2SIT
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For 2,000 L STR®	DZ002K-S2SIT
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Description	Order No.
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## Accessories

Filter Line IN 50   200 L	DS200L-SBFLI
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Filter Line OUT 50   200 L	DS200L-SBFLO
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Filter Line IN 500   1,000 L	DS001K-SBFLI
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Filter Line OUT 500   1,000 L	DS001K-SBFLO
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Filter Line IN 2,000 L	DS002K-SBFLI
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Filter Line OUT 2,000 L	DS002K-SBFLO
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Lab Cart	1ZG---0032
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Lifting Device and Adapter (STR® 500   1,000 L)	DZ-----LT2
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Lifting Device and Adapter (STR® 2,000 L)	2ZG---0009
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Biostat STR® Viamass Support 60 mm	DZ-----AD1
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Biostat STR® Viamass Support 100 mm	DZ-----AD2
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Autoclave Tray for Reusable Probes	1ZG---0034
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## Single-Use Exhaust Cooler

SU Exhaust Cooler STR® 50   200 L	DS200L---EC
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SU Exhaust Cooler STR® 500   1,000 L	DS001K---EC
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## Germany

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