

BioFlo® 320 Specifications



Control Station

Length	40.6 cm (16 in)
Width	40.6 cm (16 in)
Height	66.0 cm (26 in)
Weight	32 kg (70 lb)
Touchscreen	15 in (38.1 cm) projected capacitive touchscreen
Communication	2 x USB (software updates, serial communication) Ethernet (SCADA, IP Network)
Operating Conditions	10 – 30 °C, up to 80 % RH, non-condensing
Altitude Limit	2000 m

Connections

Utility	Connection	Requirement	
Electrical	IEC	100 – 120 / 208 – 240 VAC, 50/60 Hz, 20 A, Single Phase	
Water	Stainless steel quick-connect to 3/8 in ID silicone tubing	10 psig (0.69 bar)	
Vessel Type	Connection	Autoclavable	Single-use
Process Air			
Oxygen	Push-connect for 1/4 in OD tubing/hose barb	10 psig (0.69 barg)	6 psig (0.44 barg)
Nitrogen			
Carbon Dioxide			
Exhaust		0.5 psig (0.035 bar)	

Agitation

Autoclavable vessels

Vessel	Magnetic Drive (rpm)	Direct Drive (rpm)
1 L	25 – 500	25 – 1200
3 L	25 – 500	25 – 1200
5 L	25 – 500	25 – 1200
10 L	25 – 150	25 – 1200

Autoclavable vessels

Vessel	Magnetic drive (rpm)
BioBLU® 1f	25 – 1200
BioBLU 1c	25 – 500
BioBLU 5c/p	25 – 200
BioBLU 14c	25 – 200
BioBLU 50c	25 – 150

Temperature

Vessel Type	Operating Temperature Range
Water jacketed	5 °C above coolant to 55 °C above ambient (80 °C max)
Dished bottom	5 °C above coolant to 65 °C above ambient (90 °C max / 85 °C max for 10 L)
BioBLU 'c' single-use	5 °C above ambient to 40 °C
Sensor Type	PT100

Gasing

Vessel	No. TMFC	Flow Range (SLPM)
Sparge	1, 3, or 4	0.002 – 1 0.04 – 20
Overlay	1	0.010 – 5

Pumps 1, 2, & 3

Pump head	Watson-Marlow® 114DV			
Variable speed	5 – 25 rpm			
Fixed speed	25 rpm (0 – 100 % duty cycle)			
Tubing ID (mm)*	mL/rev	mL/min @ 5 rpm	mL/min @ 25 rpm	L/day
0.8	0.04	0.2	1.0	1.44
1.6	0.14	0.7	3.5	5.04
3.2	0.47	2.35	11.75	16.92
4.8	0.85	4.25	21.25	30.6

Pump 4

Pump head	Watson-Marlow 314D			
Variable speed	20 – 100 rpm			
Fixed speed	100 rpm (0 – 100% duty cycle)			
Tubing ID (mm)*	mL/rev	mL/min @ 5 rpm	mL/min @ 25 rpm	L/day
0.8	0.06	0.3	1.5	2.16
1.6	0.25	1.25	6.25	9
3.2	0.85	4.25	21.25	30.6
4.8	1.9	9.5	47.5	68.4
6.4	3	15	75	108

External Pumps 1 & 2

Type	Watson-Marlow 120U/DV (requires equipment connection module)			
Variable speed	0.1 – 200 rpm			
Fixed speed	N/A			
Tubing ID (mm)*	mL/rev	mL/min @ 0.1 rpm	mL/min @ 200 rpm	L/day
0.8	0.04	0.004	8	11.52
1.6	0.14	0.014	28	40.32
3.2	0.47	0.047	94	135.36
4.8	0.85	0.085	170	244.8

*All tubings referenced are 1.6 mm wall thickness

Vessel Specifications

Stainless Steel Dish Bottom

Vessel		1 L	3 L	5 L	10 L
Total volume	L	2.5	5	7.5	14
Minimum working volume	L	0.6	1.3	1.9	3.5
Maximum working volume	L	1.9	3.8	5.6	10.5
Outer diameter	cm	19.9	22.9	25.6	29.3
	in	7.8	9	10.1	11.5
Height with condensor	cm	51.8	58.8	61.2	67.9
	in	20.4	22.8	24.1	26.7
Height without condensor	cm	38.8	45	48.2	57.4
	in	15.3	17.7	19	22.6
Weight (empty)	kg	10	11	15.5	23
	lb	22.1	24.3	34.2	50.7

Vessel Specifications
Water Jacketed

Vessel		1 L	3 L	5 L	10 L
Total volume	L	2.5	5.0	7.5	14.0
Minimum working volume	L	0.6	1.3	1.9	3.5
Maximum working volume	L	1.9	3.8	5.6	10.5
Outer diameter	cm	21.6	23.1	27.7	32.3
	in	8.5	9.1	10.9	12.7
Height with condensor	cm	55.4	61.9	65.4	72.9
	in	21.8	24.4	25.7	28.7
Height without condensor	cm	42.7	49.3	52.7	62.7
	in	16.8	19.4	20.8	24.7
Weight (empty)	kg	10.0	11.0	13.3	23.0
	lb	22.1	24.3	29.3	50.7

Impellers

Type	Rushton, 6-blade				
MOC	316L stainless steel				
Vessel		1 L	3 L	5 L	10 L
OD	cm	1.89	2.36	2.77	3.32
	in	4.80	6.00	7.04	8.43
Height	cm	0.47	0.59	0.69	0.83
	in	1.19	1.50	1.76	2.11
Type	Pitched, 3-blade, 45°				
MOC	316L stainless steel				
Vessel		1 L	3 L	5 L	10 L
OD	cm	6.05	7.62	8.89	10.49
	in	2.38	3.00	3.50	4.13
Height	cm	4.01	5.23	6.28	7.19
	in	1.58	2.06	2.47	2.83
Type	Marine, 3-blade				
MOC	316L stainless steel				
Vessel		1 L	3 L	5 L	10 L
OD (in)	cm	6.35	6.35	7.62	11.43
	in	2.50	2.50	3.00	4.50
Type	Spin filter with marine blade impeller				
MOC	316L stainless steel				
Pore size	10 μ (suspension) / 75 μ (microcarrier)				
Type	Cell Lift				
Moc	316L stainless steel (body) / polyethylene screen				
Pore size	80 μ (microcarrier)				
Impeller	Draft tube				
Type	Packed bed				
MOC	316L stainless steel				
Impeller	Draft tube				
Fibra-Cel®					
Vessel		1 L	3 L	5 L	10 L
Fibra-Cel (g)		50	150	250	500

Sensors

pH	
Sensor type	Electro-chemical (gel-filled)
MOC	Glass
Communication	Analog or digital (ISM)
Control range	2 – 12
Display	0.01 pH

Optical pH	
Sensor type	Optical
MOC	N/A
Communication	Digital
Control range	6 – 8
Display	0.01 pH

DO	
Sensor type	Polarographic or optical
MOC	316L stainless steel (body)
Communication	Analog or digital (ISM)
Control range	0 – 200 %
Display	0.1

Redox	
Sensor type	Electro-chemical (gel-filled)
MOC	Glass
Communication	Analog or digital (ISM)
Control range	(-)2000 mV – (+)2000 mV
Display	0.01 mV

CO₂	
Sensor type	pH electrode
MOC	316L stainless steel (body)
Communication	Digital (ISM)
Control range	0 – 100%
Display	0.1

Recommended sensor lengths (mm)

Sensor	Autoclavable Vessels			
	1 L	3 L	5 L	10 L
pH (EC)*	200	225	225	325
DO*	220	220	320	320
Redox*	200	200	200	325
CO ₂ *	220	220	320	320

Sensor	Single-use Vessels				
	BioBLU 1c/f	BioBLU 5c	BioBLU 5p	BioBLU 14c	BioBLU 50c
pH (EC)*	120	225	100	325	N/A
DO	120	225	120	355	526
Redox*	120	225	120	325	N/A
CO ₂ *	120	220	120	320	N/A

*Requires compression fitting (M1287-5030)

Technical specifications subject to change.