



The Smarter Solution

BioFlo® 320 bioprocess control station



Highly Evolved

Whether your process includes cell culture or fermentation, autoclavable or single-use vessels, the BioFlo 320 seamlessly combines form and function in one state of the art package. A robust industrial design, intelligent sensors, Ethernet connectivity, and enhanced software capabilities are only a few of the features that set it apart from the competition. Combined with a sincere commitment to quality, the BioFlo 320 truly is the premium choice in bench-scale bioprocess control stations.

Flexible

- > Autoclavable vessels and our comprehensive portfolio of BioBLU® Single-Use Vessels provide process customization
- > Eppendorf exclusive packed-bed and cell lift impeller designs for continuous and perfusion processes
- > Universal connections for analog or digital Mettler Toledo® ISM® sensors reduce sensor complexity
- > Thermal mass flow controllers for sparge and overlay gas can be upgraded in the field
- > Universal gas control strategy for both microbial and cell culture applications removes process limitations

Powerful

- > Extensive working volume range of 250 mL – 40 L on a single control platform
- > High-powered direct and magnetic drive motor assemblies
- > Up to six integrated pumps capable of operating in variable speed mode
- > Industry standard Ethernet communication for multi-unit control of up to eight systems, Eppendorf SCADA software, and remote monitoring

Industrial

- > Industrial design featuring stainless steel front, back, and utility panels
- > Left- and right-handed orientations to maximize lab space efficiency
- > Hemispherical vessel nest design for minimum footprint
- > Robust protection of sensitive electronic components (IP68-rated connections on utility panel and IP22-rated connection for power entry)





Four universal connections for analog or digital Mettler Toledo ISM sensors

High-powered direct and magnetic drive motor assemblies; capable of clockwise and counterclockwise rotation

Control up to eight units from a single user interface

Ultra-compact design with vessel nest for minimum footprint; left- and right-handed orientations to maximize lab space

Interchangeable TMFC drawers for sparge and overlay gas flexibility

Unique variable/fix speed front-mounted pumps capable of clockwise and counterclockwise rotation

Sixteen interchangeable autoclavable vessels and the comprehensive line of BioBLU Single-Use Vessels

Industrial, brushed stainless steel panels provide enhanced corrosion resistance

Small footprint... big impact

From R&D laboratories to pilot-scale production facilities, space is a major factor when selecting the right equipment. The BioFlo 320 offers flexibility, better control, and maximum functionality while occupying a fraction of the valuable lab space of similar systems. This means greater efficiency and productivity at a lower operating cost for your lab.

BioBLU® Single-Use Vessels



- > Compatible with 250 mL – 40 L BioBLU Single-Use Vessels including the BioBLU 5p, the first single-use vessel to utilize the exclusive packed-bed impeller
- > Built-in optical pH sensor technology
- > Vessel and exhaust heat blanket connections provide precise temperature control and exhaust gas treatment
- > Bench-scale single-use vessels specifically designed for microbial fermentation
- > Rigid-walled, stirred-tank design provides many advantages over single-use bag design
 - > Eliminates potential for tears, pits, and folds during installation
 - > Single-layer polymer removes both uncertainty for leachable and extractable data and the need for unnecessary preventative actions, like pre-process media wash

Advanced Software Solutions



- > Control eight units from a single user interface
- > Automatic gas mixing algorithms for simplified control (4-gas, 3-gas, O₂ enrichment, N₂ enrichment)
- > New ten-point cascade feature for sophisticated control strategies
- > Built-in elapsed fermentation timer for batch management
- > Trend display with up to twelve process values within a single view
- > Remote access via PC or tablet

Intelligent Sensors



- > Integrated Mettler Toledo Intelligent Sensor Management (ISM) platform
- > Universal connections for up to four analog or digital (ISM) sensors
 - > pH: analog or digital (ISM)
 - > DO: analog or digital (ISM)
 - > Optical DO: digital (ISM)
 - > Redox: analog or digital (ISM)
 - > CO₂: digital (ISM)
- > Real-time sensor diagnostics anticipate sensor failure

Applications

- > Universal control for mammalian, stem cell, insect, microbial, plant, and algae cultures
- > Validation packages for use in GMP environment
- > Suitable for use in all labs, from academic through pilot-scale production
- > Batch, fed-batch, perfusion, and continuous processes
- > Secreted product, vaccine, and monoclonal antibody production
- > Growth of seed to pilot scale cultures
- > Biofuels research and manufacturing
- > Scale-up and scale-down modeling
- > Suspension or adherent cultures
- > Micro-aerobic, anaerobic, exothermic fermentation processes
- > Specialized impellers for low-shear and zero-shear process needs
- > Food and beverage
- > Fine chemical processes

BioFlo 320 Specifications

Control Station			
Dimensions (W x D x H)	40.6 x 40.6 x 66.0 cm (16 in x 16 x 26 in)		
Net weight	32 kg (70 lb)		
Touchscreen	38.1 cm (15 in) projected capacitive touchscreen		
Communication	2 x USB (software updates, serial communication) Ethernet (SCADA, IP Network) 3 x Analog Input/Output (defined as 4 – 20 mA or 0 – 5 V or 0 – 10 V)		
Utility	Connection	Requirement	
Electrical	IEC (with regional plug types)	100 – 120/208 – 240 VAC, 50/60 Hz, 2270 VA, Single Phase	
Water	Stainless steel quick-connect	10 psig (0.69 barg)	
Gas supply (Air, O ₂ , N ₂ , CO ₂)	Push-connect	Autoclavable	Single-use
		10 psig (0.69 barg)	6 psig (0.44 barg)
Exhaust	0.5 psig (0.035 barg)		
Operating conditions	10 – 30 °C, up to 80 % RH, non-condensing		
Altitude limit	2000 m		
Agitation			
Direct drive	25 – 1200 rpm (all vessel sizes)		
Magnetic drive (autoclavable vessels)	1 L, 3 L, or 5 L: 25 – 500 rpm 10 L: 25 – 150 rpm		
Magnetic drive (single-use vessels)	BioBLU 1c: 25 – 500 rpm BioBLU 1f & 3f: 25 – 1200 rpm BioBLU 3c, 5c & 14c: 25 – 200 rpm BioBLU 50c: 25 – 150 rpm		
Temperature			
Water-jacketed	5 °C above coolant to 55 °C above ambient (80 °C max)		
Stainless steel dish-bottom	5 °C above coolant to 65 °C above ambient (90 °C max; 85 °C max for 10 L)		
Single-use	5 °C above ambient to 40 °C (60 °C max for BioBLU 1)		
Sensor type	PT100		
Gas supply			
Sparge	1, 3, or 4 TMFC; ring or micro-sparger		
Overlay	1 TMFC; headspace addition		
Sensors	Communication	Control range	
pH	Analog or digital Mettler Toledo ISM	2 – 12	
Optical pH	Digital (Presens)	6 – 8	
DO	Analog or digital Mettler Toledo ISM	0 – 200 %	
Optical DO	Digital Mettler Toledo ISM	0 – 200 %	
Redox	Analog or digital Mettler Toledo ISM	(-)2000 mV – (+)2000 mV	
CO ₂	Digital Mettler Toledo ISM	0 – 100 %	
Pumps	Pump Head	Variable Speed	Fixed Speed
Pumps 1, 2, & 3	Watson-Marlow 114DV	5 – 25 rpm	25 rpm (0 – 100 % Duty Cycle)
Pump 4 (optional)	Watson-Marlow 314D	20 – 100 rpm	100 rpm (0 – 100 % Duty Cycle)
External pumps 1 & 2	Watson-Marlow 120U/DV	0.1 – 200 rpm	N/A

Specifications subject to change.

Vessel Specifications**Autoclavable vessels**

Vessel	1 L	3 L	5 L	10 L
Total volume	2.5 L	5.0 L	7.5 L	14.0 L
Working volume	0.6 – 1.9 L	1.3 – 3.8 L	1.9 – 5.6 L	3.5 – 10.5 L
Vessel type	Stainless steel dished-bottom or water-jacketed			
Material	Borosilicate Glass, 316L Stainless Steel			
Impellers				
Direct drive	Rushton, pitched blade or marine			
Magnetic drive	Pitched blade, marine, spin filter, cell lift or packed-bed			
Dimensions (with exhaust condenser)				
Stainless steel dished-bottom				
Outer diameter (OD)	19.9 cm 7.8 in	22.9 cm 9.0 in	25.6 cm 10.1 in	29.3 cm 11.5 in
Height (no exhaust filter)	51.8 cm 20.4 in	58 cm 22.8 in	61.2 cm 24.1 in	67.9 cm 26.7 in
Water-jacketed				
Outer diameter (OD)	21.6 cm 8.5 in	23.1 cm 9.1 in	27.7 cm 10.9 in	32.3 cm 12.7 in
Height (no exhaust filter)	55.4 cm 21.8 in	61.9 cm 24.4 in	65.5 cm 25.7 in	72.9 cm 28.7 in
Number of head plate ports				
6 mm	1	3	3	3
Pg 13.5	9	10	12	12
19 mm	0	1	1	1
Total	10	14	16	16
Recommended sensor lengths (mm)				
Sensor				
pH ¹	200	225	325	425
pH (packed-bed)	200	200	200	225
DO ¹	220	220	320	420
DO (packed-bed)	120	120	220	220
Redox ¹	200	225	325	425
CO ₂ ¹	220	220	320	320

Single-use vessels

Vessel	BioBLU 1 c/f	BioBLU 3c/f	BioBLU 5c	BioBLU 5p	BioBLU 14c	BioBLU 50
Total volume	1.8 L	5 L	5 L	5 L	14 L	50 L
Working volume	0.25 – 1.25 L ²	1.25 – 3.75 L	1.25 – 3.75 L	3.75 L	3.5 – 10.5 L	18 – 40 L
Vessel type	Rigid-walled, stirred-tank					
Impellers						
Magnetic drive	BioBLU c: pitched blade/BioBLU p: packed-bed/BioBLU f: Rushton-type					
Recommended sensor lengths (mm)						
pH (EC) ³	220	220	225	120	325	N/A
DO ³	220	220	225	120	355	526
Redox ³	220	220	225	120	325	N/A
CO ₂ ³	220	220	220	120	320	N/A

¹Requires compression fitting (M1287-5030), 2 x included with Vessel Connection Kit²BioBLU 1c: 425 mL minimal working volume when used with vessel stand and heat blanket³Installation may require compression fitting for optimal fit and depth (1386010200)

Specifications subject to change.

»Explore the versatility of the BioFlo[®] 320 Control Station.«

Your local distributor: www.eppendorf.com/contact
Eppendorf AG · Barkhausenweg 1 · 22339 Hamburg · Germany
eppendorf@eppendorf.com · www.eppendorf.com

www.eppendorf.com/BioFlo320

