Millipore®
Expert Pharm/BioPharm
Products & CTDMO Services

Data Sheet

Mobius® iFlex Bioreactor

The next generation of high performance single-use modular bioreactors for fed-batch and perfusion processes

The Mobius® iFlex Bioreactor is a scalable family of single-use bioreactors, ranging from 50 L to 2000 L and suitable for process development and commercial manufacturing.

With optional and configurable modules designed to adapt to a variety of control strategies, biopharmaceutical manufacturers can switch from fed-batch to perfusion and be highly responsive to market demand, uncertainty, or a change in strategy. As a skid ready to integrate into your preferred automation platform, the Mobius® iFlex Bioreactor enables your transition into the automated biomanufacturing facility of the future.

Single-use bags constructed with high-strength Ultimus® film meet the demands of both fed-batch and intensified processes, and perfusion capabilities are within reach with the Cellicon® filter assemblies for perfusion.

With best-in-class process analytical technology (PAT) capabilities, the Mobius® iFlex Bioreactor integrates all the sensors your upstream process requires for monitoring and control of critical process parameters. Additionally, the system is ready to connect to Raman analyzers and autosamplers for streamlined analytics for advanced process monitoring and control.

Benefits

- High performance with enhanced mixing and oxygen transfer.
- Flexibility to fulfill batch, fed-batch and perfusion processes.
- Scalability from 50 L to 2000 L.

Features

Enhanced bioreactor performance to meet the requirements of the most demanding upstream processes

- The single-use bag incorporates three spargers, providing a wide range of oxygen mass transfer coefficient ($k_La > 50\ hr^{-1}$) and characterized bubble sizes, to accommodate unique gassing strategies while minimizing bubble shear.
- The optimized bottom-mounted impeller design leads to fast mixing times and higher power density (P/V up to 100 W/m^3) while minimizing tip speed and mechanical shear.
- The internal X-baffle allows for fast homogeneous mixing, while preventing the formation of a vortex.

Flexible design to fit highly diverse operational strategies, balancing today's needs with tomorrow's expectations

- Fed-batch tower with up to five peristaltic pumps and up to seven mass flow controllers (MFC), allowing for a broad range of flow rates suiting both traditional and intensified needs.
- Optional fully integrated perfusion tower for complete monitoring and control of perfusion processes, with feedback loops for bioreactor and Cellicon® filter assemblies.
- Multiple addition lines at the top, side, and bottom of the single-use bag with a variety of tubing dimensions for welding, providing versatility for sterile connections.
- Double-jacketed vessel on load cells, with electrical cabinet incorporating connectors for single-use and multi-use sensors to meet advanced control and operational strategies.

Designed with scalability engineering principles in mind, to facilitate both scale up and down

- Consistent geometry across all sizes.
- Spargers scaled by open sparger area to achieve constant gas velocity (m/s) at maximum sparger flow rate.
- Impellers scaled by keeping consistent power number (N_p) with <2.2 m/s tip speed, achieving mixing times <35 seconds.
- Demonstrated engineering performance from 50 L to 2000 L.

System Components

Fed-batch hardware configuration

The constantly increasing complexity of process strategies in the biopharmaceutical industry demands a scalable single-use bioreactor that can operate in the widest range of process conditions. The Mobius® iFlex Bioreactor is designed to meet this need. In its fed-batch configuration, the system is composed of a bioreactor vessel, a fed-batch tower, and a control station.

The vessel is provided on load cells and has a door for easy bag installation, with a viewing window for visual inspection of your cell culture. The electrical box incorporates connections for the sensors you need to enable monitoring and automated control of process parameters, such as pH, DO, pCO_2 and VCD.

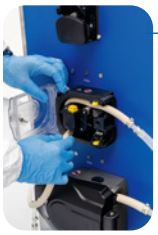
The fed-batch tower can be configured to suit your process requirements, with options available at the time the system is purchased. This tower includes 3–5 peristaltic pumps for liquid additions and 4–7 mass flow controllers for gases (air, N_2, O_2 and CO_2).

Connection for headspace:
Any MFC of choice can be directed to the headspace

Vibrant M:
Indicates system status (green: no alarms, yellow: non-critical alarms, and red: critical alarms)

Mass flow controllers:
4–7 MFCs with up to 250:1 turn-down ratio for versatility around gassing strategies

Peristaltic pumps:
Variety of pump sizes enables wide range of flow rates to cover needs for all process steps. Blinking LEDs show flow direction when pump is running



Connections for spargers:
Open pipe, drilled-hole, and high-performance spargers, with flexibility to direct any MFC to any outlet

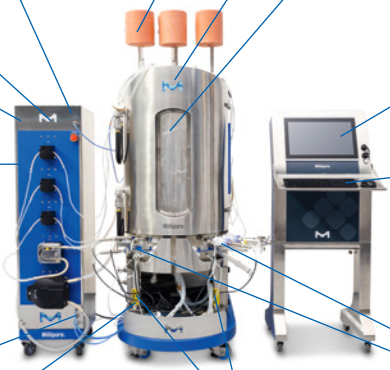
Vessel on load cells:
Feedback loop uses weight of vessel content for process control

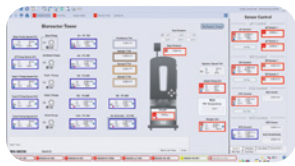
Connections for sensors:
Monitor and control pH, DO, temperature, viable cell density and pCO_2, throughout the duration of the cell culture process

Vent filter heaters:
Support for Aervent® filters that allow up to 80 SLPM of exhaust gassing per vent filter

Door: for easy bag installation

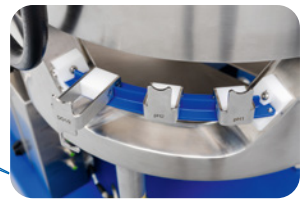
Viewing window:
For visual inspection of your cell culture





Control station for DeltaV™ control platform (optional):
18.5" touch screen HMI, allowing for easy visualization of your process P&ID

Shelf with adjustable height for keyboard:
Provides additional ergonomy and comfort for operators to work with the bioreactor



Openings for lines and sensors:
Side addition lines and aseptic connection for cell retention devices are available, as well as single-use sensors and AseptiQuik® connectors for multi-use sensors

Perfusion hardware configuration

Fully integrating scalable cell retention devices into your new or existing Mobius® iFlex Bioreactor has now become a reality. Developed as a modular platform, users of the fed-batch Mobius® iFlex Bioreactor can easily transition to a perfusion process, simply by adding a perfusion tower. The robustness and reliability of our Cellicon® filter assembly enables perfusion processes with the unparalleled design of a single-use bioreactor that can support ultra-high cell densities.

Peristaltic pumps:
Variety of pump sizes enables wide range of flow rates to cover needs for all process steps. Blinking LEDs show flow direction when pump is running:

- Small addition pump (optional)
- Cell bleed pump (optional)
- Perfusion media inlet
- Perfusate pump

Supports for single-use flowmeters:
Reduce footprint by eliminating the need for floor scales. SU flowmeters included in single-use assembly for perfusate and media in flow control

Connectors for single-use feed, retentate, and perfusate pressure sensors:
Complete process monitoring and control to ensure robust perfusion filter performance

Holder for Cellicon® Perfusion Filter:
Integrate our ready-to-use assembly for perfusion processes and benefit from the ease of use, reproducibility and scalability of Cellicon® filter assemblies

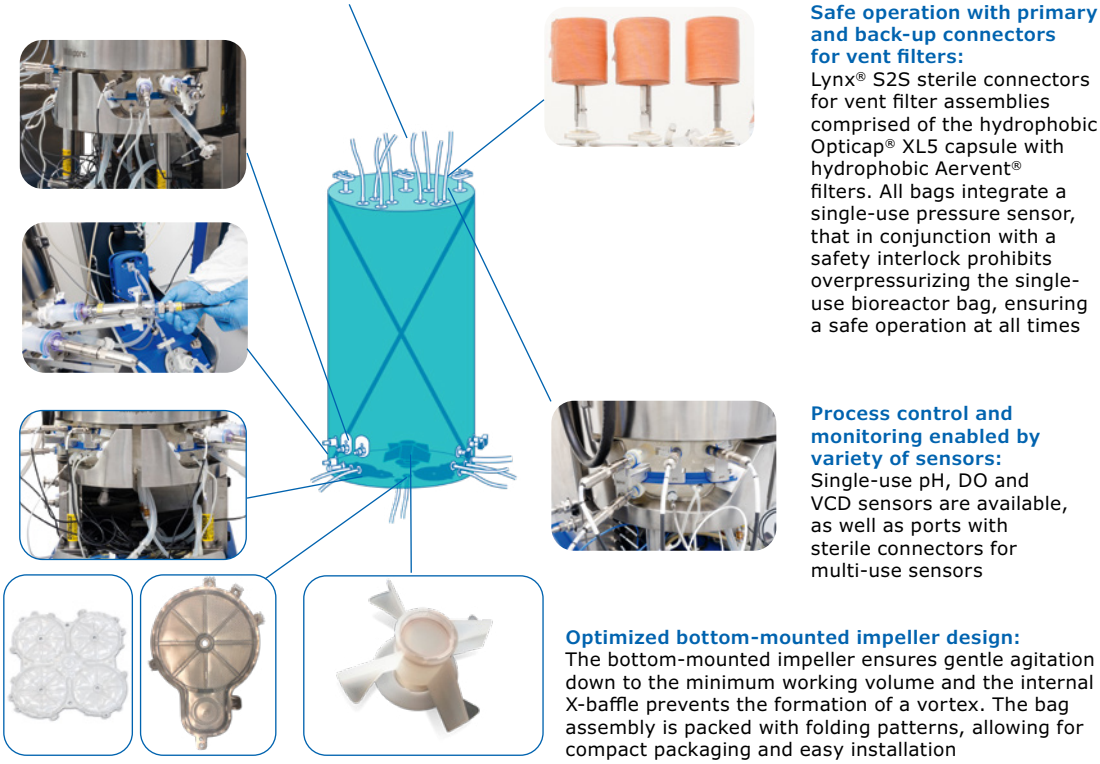
Non-invasive clamp-on feed flowmeter:
Operate feed pump by rpm or flow rate

Low shear levitating pump:
Gentle on cells, high cell densities can be produced within days

Bioreactor Flexware® Assemblies

Existing single-use bioreactor bags have limited ports for sensors and a small number of lines for additions, making them poorly suited for the complex feeding strategies of today's biologics manufacturing processes. Additionally, they have limited operating conditions because they use spargers suited to either low or high oxygen demanding processes and cannot adapt to gassing strategies for intensified processes.

The Flexware® assembly for the Mobius® iFlex Bioreactor is designed for maximum operational flexibility, ergonomic usability, and operational safety. The bag is made of Ultimus® film, a damage-resistant, single-use film that is resilient for the toughest bioprocessing applications. It contains a woven nylon layer that provides a protective barrier against abrasion, impact damage, tears, and material fatigue. With an Irgafos® 168 free contact layer and a low extractable profile, Ultimus® film offers cell growth comparable to glass without the need for clean-in-place (CIP) and steam-in-place (SIP) operations.



Designed for flexibility and long durability:
Multiple weldable, labeled lines, precisely selected to enable 40-day duration and a wide range of flow rates

Perfusion-ready:
Standard bags include AseptiQuik® connectors for smooth connection to cell retention devices

Port for ProCellics™ Raman Analyzer:
Ports are incorporated in all standard bags for seamless sensor integration

Effortless process sampling:
Options available for manual sampling using luer lock connector or via welding. Bag is ready to connect to MAST® Autosampling Solution

Safe operation with primary and back-up connectors for vent filters:
Lynx® S2S sterile connectors for vent filter assemblies comprised of the hydrophobic Opticap® XL5 capsule with hydrophobic Aervent® filters. All bags integrate a single-use pressure sensor, that in conjunction with a safety interlock prohibits overpressurizing the single-use bioreactor bag, ensuring a safe operation at all times

Process control and monitoring enabled by variety of sensors:
Single-use pH, DO and VCD sensors are available, as well as ports with sterile connectors for multi-use sensors

Wide range of mass transfer of oxygen (k_La):
All bags integrate an open pipe and two drilled-hole spargers with different pore sizes, achieving $k_La > 50\ hr^{-1}$

Optimized bottom-mounted impeller design:
The bottom-mounted impeller ensures gentle agitation down to the minimum working volume and the internal X-baffle prevents the formation of a vortex. The bag assembly is packed with folding patterns, allowing for compact packaging and easy installation

Unparalleled oxygen transfer

A common challenge of modern, intensified upstream processes is meeting the increased oxygen demand when targeting higher cell densities without working at the maximum capabilities of your single-use bioreactor. It is therefore critical to deliver the appropriate mass transfer while simultaneously managing cell shear and foaming.

With these challenges in mind, we have developed new single-use spargers that offer best-in-class performance to support a wide range of viable cell densities, by balancing high oxygen transfer while minimizing cell bubble shear. We have developed an innovative new sparging strategy, adding two laser drilled hole spargers on Ultimus® film and a novel air distribution method that ensures consistent gas bubble sizes across all scales. A high performance sparger, an average pore size of 25 µm, enables maximum k_La, while a second mid-range drilled-hole sparger, with pore sizes of 150 µm, creates larger bubbles for intermediate k_La needs. Lastly, the traditional open pipe sparger is efficient at delivering macro-bubbles and can be used on its own for gas supply or in combination with other spargers. This approach provides increased process control capabilities, such as addition of carbon dioxide for pH regulation or as a tool to strip excess carbon dioxide. All three spargers are included in our standard single-use bags, enabling operators to execute different gassing strategies, by using any or all three spargers simultaneously. This flexibility reduces the need for bag customizations and for large stocks of several different bag configurations.

Advanced mixing performance

Our bioreactor bags include a bottom-mounted, 15° off-centered 4-blade impeller, with a fin provided on each blade for maximum impeller stability at high rpm. To simplify scalability, impeller power number is kept constant across scales. The internal X-baffle prevents the formation of a vortex during mixing and allows the bottom-mounted impeller to deliver mixing times of under 35 seconds. By eliminating a shaft, our bags are delivered collapsed in a compact packaging, which ultimately reduces the transportation and storage costs and the environmental impact of packaging, while making bag installation easier for upstream operators.

Mobius® iFlex Bioreactor Services

To help you navigate the highly regulated and challenging environment of the pharmaceutical and biotechnology industry, we offer a wide range of services that can help you save time, lower costs, and comply with your specific requirements of performance and quality. For peace of mind, all our services are performed by our global experts who have an intimate knowledge of our equipment backed by decades of experience.

Qualification Services

Our qualification services are designed to make the integration of our system into your process as seamless as possible and to ensure your equipment is properly installed and functioning per your pre-defined requirements. These services are aligned with the ASTM E2500 guideline, ensuring consistency and efficiency in our qualification strategy.

- Factory acceptance test (FAT)
- Installation qualification/operational qualification (IQ/OQ)
- Performance qualification support (PQ)

Training Services

Our training offering has been designed to make your staff more autonomous in managing your system and your process while saving time and money. Our training services cover system use with interactive hands-on sessions including:

- Installing the Flexware® assemblies
- Designing and scaling your process
- Troubleshooting
- Process recommendations

These trainings can be delivered either at your site or in our M Lab™ Collaboration Centers. Please contact your local representative or email ilearn@milliporesigma.com to discuss our training offering.

System Service Reliance Plans

To support you in ensuring optimum equipment uptime and regulatory compliance while mitigating risks, we have developed a complete range of services for your systems and equipment: System Service Reliance Plans. These comprehensive packages offer priority access to a wide range of services and support, ensuring your equipment is properly maintained and allowing you to select a coverage level that best fits your needs. For additional details, please refer to the System Service Reliance Plans Data Sheet (DS7881EN).

Spare Parts & Repair Services

Repair services

In the unlikely case your system does experience a problem, our worldwide engineering organization will provide on-site technical support to get you back up and running as quickly as possible.

Spare parts

Purchasing spare parts directly from us is the only way we can guarantee that you get the right parts every time, with the same level of performance as the original. For details and ordering information, please check the illustrated spare parts list (AD12083EN).

Learn more on our systems services at **SigmaAldrich.com/services-plans**

Specifications

System and Flexware® Assembly Specifications

General System Specifications

Mobius® iFlex Bioreactor	200 L	2000 L
Working Volume (L)	40–200	400–2000
Total bioreactor volume (L)	240	2400
Total Height-to-Diameter Ratio	2:1	2:1
Vessel Diameter	54.6 cm (21.3 in.)	115.8 cm (45.6 in.)
Impeller Position	Bottom mounted 15° from center	
Impeller Diameter	21 cm (8.3 in.)	40.6 cm (16 in.)
Impeller Geometry	Down-pumping pitched blade (4 blades)	
Impeller Power Number	3.6	3.7
Internal Baffle	X-baffle	

Mechanical Specifications Mobius® iFlex Bioreactor 200 L

	Bioreactor vessel	Fed-batch tower	Perfusion tower	Control station
*Dimensions (W × D × H)	806 mm × 1100 mm × 1746 mm, max 2142 mm with vent heaters (31.7 in. × 43.3 in. × 68.7 in., max 84.3 in. with vent heaters)	400 mm × 533 mm × 1574 mm (15.8 in. × 20.9 in. × 61.9 in.)	450 mm × 964 mm × 1598 mm (17.8 in. × 37.9 in. × 62.9 in.)	With shelf: 620 mm × 660 mm × 1547 mm (24.4 in. × 26.0 in. × 60.9 in.) Without shelf: 620 mm × 530 mm × 1547 mm (24.4 in. x 20.9 in. × 60.9 in.)
Net weight (empty)	460 kg (1014 lbs)	230 kg (507 lbs)	170 kg (375 lbs)	120 kg (265 lbs)
Wheels including levelling feet	4 wheels, with integrated leveling feet	4 wheels, with 2 brakes		
Materials of construction	Stainless steel 304 minimum			

*Tolerances are provided on the mechanical drawing

Mechanical Specifications Mobius® iFlex Bioreactor 2000 L

	Bioreactor vessel	Fed-batch tower	Perfusion tower	Control station
*Dimensions (W × D × H)	1648 mm × 2447 mm × 3116 mm, max 3453 mm with vent heaters (64.9 in. x 96.5 in. × 122.7 max 135.9 in. with vent heaters)	450 mm × 700 mm x 1833 mm (17.8 in. × 27.6 in. × 72.2 in.)	700 mm × 1064 mm × 1788 mm (27.6 in. × 41.9 in. × 70.4 in.)	With shelf: 620 mm × 660 mm × 1547 mm (24.4 in. × 26.0 in. × 60.9 in.) Without shelf: 620 mm × 530 mm × 1547 mm (24.4 in. x 20.9 in. × 60.9 in.)
Net weight (empty)	1805 kg (3980 lbs)	310 kg (683 lbs)	265 kg (584 lbs)	120 kg (265 lbs)
Wheels including levelling feet	None (except drawer (×4))	4 wheels, with 2 brakes		
Materials of construction	Stainless steel 304 minimum			

*Tolerances are provided on the mechanical drawing

Operating Specifications

Mobius® iFlex Bioreactor	200 L	2000 L
Power Supply Voltage System supplied with 5 m power cord (no plug). Permanent connection recommended due to high residual voltage. Cord & plug solution possible but with appropriate instructions to disconnect power from the equipment	IEC 3× 380–400 VAC (6.5 A) IEC 3× 200–220 VAC (9 A) UL 3× 208 VAC (8.5 A)	IEC 3× 380–400 VAC (11 A) IEC 3× 200–220 VAC (19.5 A) UL 3× 208 VAC (19 A)
System operating temperature	Ambient temperature (15–30 °C)	
Altitude	0 to 2500 m	
Process duration	Validated for 40 days	

Instrument Specifications for Mobius® iFlex Bioreactors

Type	Tag		Instrument Range	Operating Process Range	Accuracy on Process Range	Notes
Multi-use pH sensor	AT001 AT002		0.00–14.00	6.00–8.00 (ability to measure 4.00)	± 0.10 post *in situ* calibration	Initial 2-point calibration is required (refer to Hamilton technical documentation). *In situ* calibration is required. For information: drift per day max ± 0.06
Single-use pH sensor			3.00–10.00			Factory calibration data provided with the single-use element is required and should be entered into the Arc Module. *In situ* calibration is required. For information: drift per day max ± 0.06
Multi-use dissolved oxygen sensor	AT003 AT004		0–300% air saturation	20–60% air saturation	± 10% of measured value post *in situ* calibration	Initial 2-point calibration is recommended (refer to Hamilton technical documentation). *In situ* calibration with 100% Air sat. in cell culture media is required. For information: drift per day max ± 2% Air sat.
Single-use dissolved oxygen sensor						Factory calibration data provided with the single-use element is required and should be entered into the Arc Module. *In situ* calibration with 100% Air sat. in cell culture media is required. For information: drift per day max ± 2 % Air sat.
Multi-use partial pressure of carbon dioxide sensor	AT005		0.5–100% volume	0.5–30% volume	Please refer to Hamilton technical documentation: ± 5% of measured value (> 100 mbar)	Initial 2-point calibration is required (refer to Hamilton technical documentation). *In situ* product calibration can be done additionally (refer to Hamilton technical documentation)
Multi-use viable cell density sensor	AT006		0–700 pF/cm	0–700 pF/cm	Please refer to Hamilton technical documentation. Accuracy at 25 °C: Conductivity (at 0 pF): ± 25 µS or ± 1%, whichever value is greater over the entire measuring range	Factory calibration only. Mark zero (zero adjustment) is required before inoculation
Single-use viable cell density sensor					Please refer to Hamilton technical documentation. Accuracy at 25 °C: Conductivity (at 0 pF): ± 5%	Factory calibration data provided in the User Guide is required and should be entered into the Arc Module. Mark zero (zero adjustment) is required before inoculation
Single-use flow sensor	Mobius® iFlex 200 L Bioreactor	FE001 FE102	0–0.8 LPM	0.035–0.500 LPM	n/a	For indication: accuracy ± 10% of measured value with C-Flex 374 tubing, fluid at 37 °C and water like fluid viscosity. Zero adjustment after priming of the lines, with pumps stopped, is required
	Mobius® iFlex 2000 L Bioreactor	FE001 FE102 FE104	0–8 LPM	0.35–4.16 LPM		
Non-intrusive clamp-on flow sensor	Mobius® iFlex 200 L Bioreactor	FT101	0–20 LPM	1–6 LPM	n/a	For indication: accuracy ± 10% of measured value with C-Flex 374 tubing, fluid at 37 °C, viscosity <3 Cp. Zero adjustment after priming of the lines, with pumps stopped, is required
	Mobius® iFlex 2000 L Bioreactor	FT101 FT103	0–80 LPM	20–30 LPM		

Instrument Specifications for Mobius® iFlex Bioreactors (continued)

Type	Tag		Instrument Range	Operating Process Range	Accuracy on Process Range	Notes
Mass flow controllers	Mobius® iFlex 200 L Bioreactor	FC100 FC200 FC300	0.2–50 SLPM	1–50 SLPM	1–10 SLPM: ± 0.09 SLPM > 10–50 SLPM: ± 5% of setpoint	Zeroing of the MFC after warming up by pressing the “zero button” is recommended. Maximum flow range are given for N_2 equivalent (which also applies to Air and Oxygen) and will be limited in case of CO_2. Refer to the configurator for maximum flow range with CO_2
	Mobius® iFlex 2000 L Bioreactor	FC300				
	Mobius® iFlex 200 L Bioreactor	FC400 FC500 FC600 FC700	0.2–50 SLPM or 0.08–20 SLPM or 0.04–10 SLPM or 0.02–5 SLPM	1–50 SLPM or 0.4–20 SLPM or 0.2–10 SLPM or 0.1–5 SLPM	50 SLPM: 1–10 SLPM: ± 0.09 SLPM > 10–50 SLPM: ± 5% of setpoint 20 SLPM: 0.4–4 SLPM: ±0.036 SLPM > 4–20 SLPM: ± 5% of Setpoint 10 SLPM: 0.2–2 SLPM: ±0.018 SLPM > 2–10 SLPM: ± 5% of Setpoint 5 SLPM: 0.10–1 SLPM: ± 0.009 SLPM > 1–5 SLPM: ± 5% of Setpoint	
	Mobius® iFlex 2000 L Bioreactor	FC100 FC200	16.7–200 SLPM	100–200 SLPM	100–200 SLPM: ± 5% of Setpoint	
	Mobius® iFlex 2000 L Bioreactor	FC400 FC500 FC600 FC700	0.2–50 SLPM or 0.08–20 SLPM	1–50 SLPM or 0.4–20 SLPM	50 SLPM: 1–10 SLPM: ± 0.09 SLPM > 10–50 SLPM: ± 5% of setpoint 20 SLPM: 0.4–4 SLPM: ± 0.036 SLPM > 4–20 SLPM: ± 5% of Setpoint	
Bioreactor bag single-use pressure sensor	PE001		0–6 psi	0–0.5 psi (200 L) 0–0.4 psi (2000 L)	n/a	Zero adjustment (offset) of the pressure sensor has to happen when the Flexware® assembly is at atmospheric pressure. Bag pressure interlock value to stop MFCs is set to 0.5 psi for 200 L and 0.4 for 2000 L (detection ± 0.05 psi)
Cellicon® Filter Assembly single-use pressure sensors	PE101 PE102 PE103 (also PE104, PE105 & PE106 in Mobius® iFlex 2000 L Bioreactor)		-10 to 10 psi	-10 to 10 psi	± 5% of measured value	Zero adjusment (offset) of the pressure sensor has to happen when the Flexware® assembly is at atmospheric pressure
Non-intrusive temperature sensor	TE001		-50 to 150 °C	4–40 °C	± 0.2 °C	
Load cells	WE001 WE002 WE003		200 L: 0–240 kg	0–240 kg	± 0.6 kg	
			2000 L: 0–2400 kg	0–2400 kg	± 6 kg	
Mixer	M201		200 L: 0–350 rpm	0–144 rpm	n/a	For indication: speed feedback accuracy ± 5% of reading. Mixer is used with a single-use impeller
			2000 L: 0–140 rpm	27–102 rpm		

Instrument Specifications for Mobius® iFlex Bioreactors (continued)

Type	Tag		Instrument Range	Operating Process Range	Accuracy on Process Range	Notes
Peristaltic pumps	300 series pumps		8–408 rpm	15–200 rpm	n/a	Pump is used with a single-use element (tubing). Accuracy of speed feedback depends on SW calibration of the analog signal (offset and slope)
	Mobius® iFlex 200 L Bioreactor	P001 P002 P003 P006 P007 P008 P102				
	Mobius® iFlex 2000 L Bioreactor	P001 P002 P003 P006				
	500 series pumps		0–220 rpm	15–110 rpm		
	Mobius® iFlex 200 L Bioreactor	P004				
	Mobius® iFlex 2000 L Bioreactor	P007 P102 P104				
	600 series pumps		0–282 rpm	15–150 rpm		
	Mobius® iFlex 200 L Bioreactor	P005				
	Mobius® iFlex 2000 L Bioreactor	P004 P008				
	700 series pumps Mobius® iFlex 2000 L Bioreactor: P005		8–360 rpm	15–180 rpm		
Centrifugal pump	P101 (also P103, in Mobius® iFlex 2000 L Bioreactor)		200 L: 0–7000 rpm 2000 L: 0–8000 rpm	0–4000 rpm	n/a	Pump is used with a single-use element
Vent heaters	Mobius® iFlex 200 L Bioreactor: VH001, VH002, VH003		0–90 °C	0–60 °C	n/a	Recommended temperature setpoint: 55 °C
	Mobius® iFlex 2000 L Bioreactor: VH001, VH002, VH003, VH004, VH005, VH006					

Flexware® Specifications

Flexware® Assembly	200 L	
Gas Lines (headspace, open pipe, drilled-hole and high performance spargers)	Filter	Millipak® filters with 0.22 µm hydrophobic Durapore® membrane
	Open pipe diameter (1 hole)	7.4 mm
	High performance sparger pore size	25 µm drilled holes in Ultimus® film
	Mid-range drilled-hole pore size	150 µm drilled holes in Ultimus® film
Sampling	Lines with luer lock	2
	Weldable lines for sterile sampling	2
Probes configuration	MU assembly	7 × ports for MU instruments
	SU assembly	2 × single-use pH probes, 2 × single-use DO probes, 1 × single-use VCD probe and 3 × ports for MU instruments
Dimensions of Flexware® Box (L × W × H)	90.8 cm × 60.3 cm × 26.0 cm (35.8 in. × 23.8 in. × 10.3 in.)	
Weight of Box with Flexware®	11.2 kg (24.7 lbs)	
Weight of Bag Assembly	7.4 kg (16.1 lbs)	
Flexware® Assembly	**2000 L**	
Gas Lines (headspace, open pipe, drilled-hole and high performance spargers)	Filter	Millipak® filters with 0.22 µm hydrophobic Durapore® membrane
	Open pipe diameter (2 holes)	10.4 mm
	High performance sparger pore size	25 µm drilled holes in Ultimus® film
	Mid-range drilled-hole pore size	150 µm drilled holes in Ultimus® film
Sampling	Lines with luer lock	2
	Weldable lines for sterile sampling	2
Probes configuration	MU assembly	7 × ports for MU instruments
	SU assembly	2 × single-use pH probes, 2 × single-use DO probes, 1 × single-use VCD probe and 3 × ports for MU instruments
Dimensions of Flexware® Box (L × W × H)	118.1 cm × 77.5 cm × 34.3 cm (46.5 in. × 30.5 in. × 13.5 in.)	
Weight of Box with Flexware®	24.9 kg (55.0 lbs)	
Weight of Bag Assembly	18.6 kg (41.0 lbs)	
Mobius® Vent Filter Assembly		
Sterile filter	Opticap® XL5 capsule with Aervent® 0.2 µm membrane	
Connector	Male Lynx® Connector 1/2" HB	
Dimensions of Assembly Box (L × W × H)	43 cm × 19 cm × 13 cm (16.9 in. × 7.5 in. × 5.1 in.)	
Weight of Box with Assembly	0.31 kg (0.68 lb)	
Perfusion Media Addition Line		
	BRXPERFB102 (200L)	BRXPERFB105 (2000L)
Dimensions of Assembly Box (L × W × H)	89.5 cm × 59.7 cm × 31.8 cm (35.3 in. × 23.5 in. × 12.5 in.)	89.5 cm × 59.1 cm × 41.9 cm (35.3 in. × 23.3 in. × 16.5 in.)

Flexware® 200 L Tubing Specifications (BRX0200L101)

Location	Tubing	Tubing Material	Diameter (in.)		Tubing Length (in.)	End Connection
			Inner	Outer		
Top	Vent Tubing	Pharma 50	1/2	7/8	3	Female Lynx® Connector 1/2" HB
	Vent Tubing	Pharma 50	1/2	7/8	3	Female Lynx® Connector 1/2" HB
	Vent Tubing	Pharma 50	1/2	7/8	3	Female Lynx® Connector 1/2" HB
	Pressure Sensor	Pharma 50	1/2	7/8	6	Plug (includes PendoTech® Pressure Sensor with IP67 connector, 1/2" HB)
	Medium Addition Tubing	Pharma 50	3/8	5/8	72	Plug
		Pharmed	3/8	1/2	24	
		C-Flex-374	1/4	7/16	24	
	Small Addition Tubing	Pharma 50	1/4	1/2	6	Plug
		Pharma 50	1/8	1/4	60	
		Pharmed	1/8	1/4	12	
		C-Flex-374	1/8	1/4	24	
	Small Addition Tubing	Pharma 50	1/4	1/2	6	Plug
		Pharma 50	1/8	1/4	60	
		Pharmed	1/8	1/4	12	
		C-Flex-374	1/8	1/4	24	
	Small Addition Tubing	Pharma 50	1/4	1/2	6	Plug
		Pharma 50	1/8	1/4	60	
		Pharmed	1/8	1/4	12	
		C-Flex-374	1/8	1/4	24	
	Small Addition Tubing	Pharma 50	1/4	1/2	6	Plug
		Pharma 50	1/8	1/4	60	
		Pharmed	1/8	1/4	12	
		C-Flex-374	1/8	1/4	24	
	Small Addition Tubing	Pharma 50	1/4	1/2	6	Plug
		Pharma 50	1/8	1/4	60	
		Pharmed	1/8	1/4	12	
		C-Flex-374	1/8	1/4	24	
	Large Addition Tubing	Pharma 50	1/2	3/4	72	Plug
		Pharmed	1/2	3/4	30	
		C-Flex-374	3/8	5/8	24	
		C-Flex-374	1/4	7/16	24	
	Perfusion Media Line	Pharma 50	1/4	1/2	12	AseptiQuik® G 1/4" HB
		C-Flex-374	1/4	7/16	60	
	Gas Overlay Tubing	Pharma 50	1/4	1/2	24	Millipak® Filter Durapore® 0.22 (1/4" HB × 1/4" HB)
Lower Front	Luer sampling	Pharma 50	1/4	1/2	2	Needleless sample valve
		C-Flex-374	1/8	1/4	6	
	Luer sampling	Pharma 50	1/4	1/2	2	Needleless sample valve
		C-Flex-374	1/8	1/4	6	
	Weldable sampling line	Pharma 50	1/4	1/2	2	Plug
		C-Flex-374	1/8	1/4	24	
	Weldable sampling line	Pharma 50	1/4	1/2	2	Plug
		C-Flex-374	1/8	1/4	24	
	Temperature Probe Port	Pharma 50	cannot be welded			Male luer
	MU sensor	Molded tubing (silicone)	1/2	3/4	2.9	AseptiQuik® G 1/2" HB
	MU sensor	Molded tubing (silicone)	1/2	3/4	2.9	AseptiQuik® G 1/2" HB
	MU sensor	Molded tubing (silicone)	1/2	3/4	2.9	AseptiQuik® G 1/2" HB
	SU Sensor pH1	OneFerm pH 70 NTC (Hamilton)				
	SU Sensor pH2	OneFerm pH 70 NTC (Hamilton)				
	SU Sensor DO1	ODO Cap S3 (Hamilton)				
	SU Sensor DO2	ODO Cap S3 (Hamilton)				
	SU Sensor VCD	Incyte-P SU (Hamilton)				
	Cell Retention Device return line (perfusion return)	Pharma 50	3/4	1	4	AseptiQuik® G 3/4" HB
	Cell Bleed Line	Pharma 50	1/4	1/2	12	Plug
		C-Flex-374	1/4	7/16	24	
		Pharmed	1/8	1/4	12	
		C-Flex-374	1/8	1/4	24	

Flexware® 200 L Tubing Specifications continued (BRX0200L101)

Location	Tubing	Tubing Material	Diameter (in.) Inner	Diameter (in.) Outer	Tubing Length (in.)	End Connection
Bottom	Open Pipe Tubing	Pharma 50	1/4	1/2	30	Millipak® Filter Durapore® 0.22 (1/4" HB × 1/4" HB), including a non-return valve
	Mid-range Drilled Hole Sparger	Pharma 50	1/4	1/2	30	Millipak® Filter Durapore® 0.22 (1/4" HB × 1/4" HB), including a non-return valve
	High Performance Sparger	Pharma 50	1/4	1/2	30	Millipak® Filter Durapore® 0.22 (1/4" HB × 1/4" HB), including a non-return valve
	Cell Retention Device feed line (perfusion outlet)	C-Flex-374	1/2	3/4	48	AseptiQuik® G 1/2" HB
	Harvest Drain Line	Pharma 50	1/2	3/4	60	Plug, including a clamp 1.5" TC (between Pharma 50 and C-Flex)
		C-Flex-374	1/2	3/4	18	
		Pharmed	1/2	3/4	30	
		C-Flex-374	3/8	5/8	18	

Flexware® 2000 L Tubing Specifications (BRX2000L101)

Location	Tubing	Tubing Material	Diameter (in.) Inner	Diameter (in.) Outer	Tubing Length (in.)	End Connection
Top	Vent Tubing	Pharma 50	1/2	7/8	3	Female Lynx® Connector 1/2" HB
	Vent Tubing	Pharma 50	1/2	7/8	3	Female Lynx® Connector 1/2" HB
	Vent Tubing	Pharma 50	1/2	7/8	3	Female Lynx® Connector 1/2" HB
	Vent Tubing	Pharma 50	1/2	7/8	3	Female Lynx® Connector 1/2" HB
	Vent Tubing	Pharma 50	1/2	7/8	3	Female Lynx® Connector 1/2" HB
	Vent Tubing	Pharma 50	1/2	7/8	3	Female Lynx® Connector 1/2" HB
	Pressure Sensor	Pharma 50	1/2	7/8	6	Plug (includes PendoTech® Pressure Sensor with IP67 connector, 1/2" HB)
	Medium Addition Tubing	Pharma 50	5/8	7/8	96	Plug
		Pharmed	5/8	7/8	36	
		C-Flex-374	3/8	5/8	36	
		C-Flex-374	1/4	7/16	36	
	Small Addition Tubing	Pharma 50	1/4	1/2	84	Plug
		Pharmed	1/4	3/8	24	
		C-Flex-374	1/4	7/16	36	
		C-Flex-374	1/8	1/4	36	
	Small Addition Tubing	Pharma 50	1/4	1/2	84	Plug
		Pharmed	1/4	3/8	24	
		C-Flex-374	1/4	7/16	36	
		C-Flex-374	1/8	1/4	36	
	Small Addition Tubing	Pharma 50	1/4	1/2	84	Plug
		Pharmed	1/4	3/8	24	
		C-Flex-374	1/4	7/16	36	
		C-Flex-374	1/8	1/4	36	
	Small Addition Tubing	Pharma 50	1/4	1/2	84	Plug
		Pharma 50	1/4	3/8	24	
		Pharmed	1/4	7/16	36	
		C-Flex-374	1/8	1/4	36	
	Small Addition Tubing	Pharma 50	1/4	1/2	84	Plug
		Pharma 50	1/4	3/8	24	
		Pharmed	1/4	7/16	36	
		C-Flex-374	1/8	1/4	36	
	Large Addition Tubing	Pharma 50	3/4	1	96	Plug
		Pharmed	3/4	1	48	
		C-Flex-374	1/2	3/4	36	
		C-Flex-374	1/4	7/16	36	
	Perfusion Media Line	Pharma 50	1/2	3/4	24	AseptiQuik® G 1/2" HB
		C-Flex-374	1/2	3/4	60	
	Gas Overlay Tubing	Pharma 50	1/2	3/4	84	Opticap® XL300 Filters SPG 0.2 (1/2" HB × 1/2" HB)

Flexware® 2000 L Tubing Specifications continued (BRX2000L101)

Location	Tubing	Tubing Material	Diameter (in.)		Tubing Length (in.)	End Connection
			Inner	Outer		
Lower Front	Luer sampling	Pharma 50	1/4	1/2	2	Needleless sample valve
		C-Flex-374	1/8	1/4	6	
	Luer sampling	Pharma 50	1/4	1/2	2	Needleless sample valve
		C-Flex-374	1/8	1/4	6	
	Weldable sampling line	Pharma 50	1/4	1/2	2	Plug
		C-Flex-374	1/8	1/4	24	
	Weldable sampling line	Pharma 50	1/4	1/2	2	Plug
		C-Flex-374	1/8	1/4	24	
	Temperature Probe Port	Pharma 50	cannot be welded			Male luer
	MU sensor	Molded tubing (silicone)	1/2	3/4	2.9	AseptiQuik® G 1/2" HB
	MU sensor	Molded tubing (silicone)	1/2	3/4	2.9	AseptiQuik® G 1/2" HB
	MU sensor	Molded tubing (silicone)	1/2	3/4	2.9	AseptiQuik® G 1/2" HB
	SU Sensor pH1	OneFerm pH 70 NTC (Hamilton)				
	SU Sensor pH2	OneFerm pH 70 NTC (Hamilton)				
	SU Sensor DO1	ODO Cap S3 (Hamilton)				
	SU Sensor DO2	ODO Cap S3 (Hamilton)				
	SU Sensor VCD	Incyte-P SU (Hamilton)				
	Cell Retention Device return line (perfusion return)	Pharma 50	1	1 3/8	6	AseptiQuik® L 1" HB
	Cell Retention Device return line (perfusion return)	Pharma 50	1	1 3/8	6	AseptiQuik® L 1" HB
	Cell Retention Device return line (perfusion return)	Pharma 50	1	1 3/8	6	AseptiQuik® L 1" HB
	Cell Retention Device return line (perfusion return)	Pharma 50	1	1 3/8	6	AseptiQuik® L 1" HB
	Cell Bleed Line	Pharma 50	3/8	5/8	12	Plug
		C-Flex-374	3/8	5/8	48	
		Pharmed	3/8	1/2	24	
		C-Flex-374	1/4	7/16	24	
Bottom	Open Pipe Tubing	Pharma 50	1/2	3/4	66	Opticap® XL300 Filters SPG 0.2 (1/2" HB × 1/2" HB) including a non-return valve
	Mid-range Drilled Hole Sparger	Pharma 50	1/2	3/4	66	Opticap® XL300 Filters SPG 0.2 (1/2" HB × 1/2" HB) including a non-return valve
	High Performance Sparger	Pharma 50	1/2	3/4	66	Opticap® XL300 Filters SPG 0.2 (1/2" HB × 1/2" HB) including a non-return valve
	Cell Retention Device feed line (perfusion outlet)	C-Flex-374	3/4	1	84	AseptiQuik® L 3/4" HB
	Cell Retention Device feed line (perfusion outlet)	C-Flex-374	3/4	1	84	AseptiQuik® L 3/4" HB
	Harvest Drain Line	Pharma 50	3/4	1	72	Plug, including a clamp 1.5" TC (between Pharma 50 and C-Flex)
		C-Flex-374	3/4	1	24	
		Pharmed	3/4	1	36	
		C-Flex-374	1/2	3/4	24	

Perfusion Media Line with Single-Use Flowmeter Specifications

Perfusion Media Line Assembly	200 L: BRXPERFB102	2000 L: BRXPERFB105
Connector	AseptiQuik® G 1/4" HB	AseptiQuik® G 1/2" HB
Pump Tubing	BIOPRENE (6.4 mm ID × 11.2 mm OD)	BIOPRENE (12.7 mm ID × 19.1 mm OD)
Flow Sensor	Single-use Levitronix® flow sensor	
Weldable Tubing	C-Flex-374 1/8" ID × 1/4" OD	C-Flex-374 1/2" ID × 3/4" OD
		C-Flex-374 3/8" ID × 5/8" OD

Ordering Information

Description		Cat. No
Systems		
Please contact your sales representative for a quotation		
Single-use Assemblies		
Flexware® Assembly for Mobius® iFlex Bioreactor 200 L – Single-use Sensors		**BRX0200L101**
Flexware® Assembly for Mobius® iFlex Bioreactor 200 L – Multi-use Sensors		**BRX0200L102**
Flexware® Assembly for Mobius® iFlex Bioreactor 200 L – Perfusion Media Line with single-use Flowmeter		**BRXPERFB102**
Flexware® Assembly for Mobius® iFlex Bioreactor 2000 L – Single-use Sensors		**BRX2000L101**
Flexware® Assembly for Mobius® iFlex Bioreactor 2000 L – Multi-use Sensors		**BRX2000L102**
Flexware® Assembly for Mobius® iFlex Bioreactor 2000 L – Perfusion Media Line with single-use Flowmeter		**BRXPERFB105**
Mobius® Bioreactor Vent filter assembly		**CRVFL05E01**
Mobius® Bioreactor Clamp Kit		**CRCLAMPKIT01**
Mobius® Bioreactor Clamp Kit (4 packs)		**CRCLAMPKIT04**
System Services		
Qualification	**200 L**	**2000 L**
Mobius® iFlex Bioreactor – Factory Acceptance Test, for fed-batch configuration	**SSVFATIF5**	**SSVFATIF1**
Mobius® iFlex Bioreactor – Factory Acceptance Test, for perfusion configuration	**SSVFATIP5**	**SSVFATIP1**
Mobius® iFlex Bioreactor – IQ/OQ execution (includes protocol in English and travels), for fed-batch configuration	**SSVQUAIF5**	**SSVQUAIF1**
Mobius® iFlex Bioreactor – IQ/OQ execution (includes protocol in English and travels), for perfusion configuration	**SSVQUAIP5**	**SSVQUAIP1**
Maintenance and Repair	**200 L**	**2000 L**
Mobius® iFlex Bioreactor – Essential Service Reliance Plan	**SSVESPIB5**	**SSVESPIB1**
Mobius® iFlex Bioreactor – Advanced Service Reliance Plan	**SSVESPIB5 + SSVADCIB5**	**SSVESPIB1 + SSVADCIB1**
Mobius® iFlex Bioreactor – Total Service Reliance Plan	**SSVESPIB5 + SSVTOCIB5**	**SSVESPIB1 + SSVTOCIB1**
Spare Parts		
Please refer to spare parts list AD12083EN available at **SigmaAldrich.com/iFlex**		

Related resources

Scalability and Performance Guide: PG12163EN.

Scalability from Mobius® 3 L Single-use Bioreactor to 50 L – 2000 L Mobius® iFlex Bioreactors to support intensified upstream process development: AN12431EN.

A Comparative Analysis of Mixing Characterization Methods in Stirred Tanks: WP11699EN.

Investigation of increasing poloxamer 188 concentrations on bubble size, volumetric mass transfer, and foam generation to enable intensified bioreactor processes: WP12656EN.

Demonstrated Strength and Durability of Ultimus® Film: TB5661EN.

Cellicon® Cell Retention Solution for Process Scale: DS11660EN.

A power number model-based approach for scalable impeller designs to meet oxygenation demands of intensified bioprocesses. PS9878EN.

Novel gas delivery, distribution, and scalability strategies for meeting increased oxygen demand in intensified bioreactor processes. PS12483EN.

For more information on Mobius® iFlex Bioreactors, including additional documentation, videos and animations, please visit **SigmaAldrich.com/iFlex**

MilliporeSigma
400 Summit Drive
Burlington, MA 01803

Lit. No. MS_DS12340EN Ver. 4.0
03/2025