

BioPAT[®] Viamass

Standardized Online Biomass Measurement in Single-Use Fermentation

Product Information

One of the most requested parameters in industrial cell cultivation is the monitoring of biomass. The knowledge of the biomass progress during a fermentation process gives deeper process knowledge and understanding. Therefore it enables the control of the biomass and helps to define feeding, harvest or infection points.

Offline methods like visual cell counting or semi-automated systems still dominate the biomass measurement in industrial cell cultivation. But these offline methods based on taking a representative sample cannot monitor the process continuously.



The radio frequency (RF) impedance method for online in-situ detection of viable biomass has already become well established in biopharmaceutical applications using traditional reusable fermenter equipment. But industrial cell cultivation tends more and more to single-use (SU) fermentation solutions.

In order to follow these, an easy-to-use online biomass monitoring system is a basic necessity. BioPAT® Viamass is the first standardized online biomass measurement solution for single-use fermenter systems which is fully integrated into the standard fermenter control system and tailored to the single-use fermentation bags such as the Flexsafe® RM, also in Flexsafe STR®.

Biostat® B With RM | Flexsafe® RM – Use in Rocking Motion Fermentation Systems

The rocking motion of the fermentation system causes signal fluctuations of the measurement signal due to the variation of the liquid level over the sensor. For this reason, appropriate optimization filters are implemented in the sensor's electronics including different rocking motion parameters. Using these filters enables the biomass evolution monitoring continuously in rocking motion cell cultivation.

Configuration of the System

A complete BioPAT® Viamass system consists of:

1. The BioPAT® Viamass Electronics for signal generation and evaluation (Art.No. BPV0001). This includes a lightweight pre-amplifier with an integral sensor disc connector.
2. A connection cable
 - a) A connection cable to the DCU or
 - b) A connection cable to the Connect Hub for service and manual configuration – the Connect Hub is mandatory for the use of the analog output via 4 – 20 mA, the Connect Hub connects the electronics to a PC.
3. A BioPAT® Viamass Signal Simulator Set (Art.No. BPV0011) for functionality validation.
4. The single-use sensor disc, which is welded in a Flexsafe® RM or Flexsafe STR® bag.

Validation and Extractable Testing

BioPAT® Viamass sensor discs have been qualified applying the most complex and innovative test regimes. Biological, chemical and physical tests combined with extractable testing prove lowest extractable and leachable levels and excellent compatibility to the relevant pharmacopoeias and guidelines. For more information, please refer to our Validation Guide and Extractable Guide. A leachable testing service is also available. Please contact your local Sartorius representative for further information.

Quality Assurance

All relevant materials are selected following applicable regulations and standards such as FDA, CFRs, cGMPs and in-house guidelines. This includes the terms of delivery and acceptance of our purchasing department. Finished Flexsafe® RM | Flexsafe STR® bags undergo final product quality control which is certified with the Quality Assurance certificate included with every bag.

Electromagnetic Compatibility

A Declaration of Conformity is available from Sartorius.

BioPAT® Viamass and Biobrain®

BioPAT® Viamass can be used with the Biobrain® Automation Platform. Together with advanced process monitoring through BioPAT® sensors, the standalone GMP automation platform Biobrain® powers the Biostat STR® bioreactor and the Biostat RM® for superior process control to deliver quality product to the market. It is possible to flexibly configure the processes via Biobrain® without engineering it, for example adding new sensors.

Technical Specifications

BioPAT® Viamass Electronics – Technical Data

Frequency Range	50 KHz to 20 MHz
Measuring Ranges	
Capacitance	0.0 to 400 pF/cm
Conductivity	1.0 to 40 mS/cm
Cell Concentration Range	Depends on cell sizes but typically: <ul style="list-style-type: none">▪ Yeast (6 µm): 10⁶ cells/ml to 10¹⁰ cells/ml▪ Bacteria (1 µm): 10⁹ cells/ml to 10¹³ cells/ml▪ Animal Cell (12 µm): 10⁵ cells/ml to 10⁹ cells/ml▪ Plant Cell (50 µm): 10³ cells/ml to 10⁷ cells/ml
Power Supply	<ul style="list-style-type: none">▪ Power is provided by the control tower in standard configurations▪ For service and manual configuration power is supplied by a connection hub running on 110 V AC to 240 V AC mains
Environmental	<ul style="list-style-type: none">▪ IP41 rated▪ Safe ambient operating temperature range: 5 °C to 40 °C
Dimensions of Housing	
Main Enclosure	<ul style="list-style-type: none">▪ Height × Width × Depth (approx): 30 mm × 135 mm × 64 mm▪ Weight (approx): 211 g
Remote Enclosure	<ul style="list-style-type: none">▪ Height × Width × Depth (approx.) 28 mm × 95 mm × 34 mm▪ Weight (approx): 81 g

BioPAT® Viamass: Manufactured under a license from Hamilton.

Ordering Information

Electronics

Item	Order Number
BioPAT® Viamass electronics for single-use (SU)	BPV0001
BioPAT® Viamass electronics for multi-use (MU)	BPV0M03

Signal Simulators

Item	Order Number
BioPAT® Viamass signal simulator set for single-use (SU)	BPV0011
BioPAT® Viamass signal simulator set for multi-use (MU)	BPV0MCK

Connect Hubs

Item	Order Number
BioPAT® Viamass Connect Hub (1-Way)	BPV0031
BioPAT® Viamass Connect Hub (4-Way)	BPV0034

Probes

Item	Order Number
BioPAT® Viamass 25 mm flush probe for SartoSafety Port	BPV0MSS
BioPAT® Viamass 25 mm flush probe for Ingold	BPV0MIG
BioPAT® Viamass 12 mm annular probe for 1 L	BPV0M1L
BioPAT® Viamass 12 mm annular probe for 2 L	BPV0M2L
BioPAT® Viamass 12 mm annular probe for 5 L	BPV0M5L
BioPAT® Viamass 12 mm annular probe for 10 L	BPV0MXL

Cables

Item	Order Number
Data Cable BioPAT® Viamass to Connect Hub, 2 m	SSS000040
Data Cable BioPAT® Viamass to DCU, 5 m	SSS000039
Data Cable BioPAT® Viamass to DCU, 3 m	SSS000038
Electrical Grounding Cable, 1.5 m	SSS000037
Grounding Cable, 5 m	SSS000036
Grounding Cable, 3 m	SSS000035

Accessories

BioPAT® Viamass Support


Item	Order Number
BioPAT® Viamass Support for 500 L and 1000 L STR Gen.1	DZ-----AD1
BioPAT® Viamass Support for 500 L - 2000 L STR Gen.2 Gen.3 and 2000 L Gen.1	DZ-----AD2

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