



Integrated Cell Culture Analyzers

Ambr[®] 15 Cell Culture and
Ambr[®] 250 High Throughput

Simplifying Progress

SARTORIUS

Ambr[®] Analysis Module

The Analysis Module provides add-on capability for accurate, rapid and low volume pH measurement for Ambr[®] 15 Cell Culture and Ambr[®] 250 High Throughput bioreactors, for the purpose of initial bioreactor vessel pH sensor calibration and subsequent in-process re-calibration. Close coupling to the Ambr[®] system ensures the best possible measurement accuracy, minimum sample volume requirement and fastest cycle time.

The Analysis Module is provided as an option from Sartorius

The benefits

- Improve pH control and culture performance with frequent, accurate pH sensor recalibration
- Highly accurate pH assays with reduced CO₂ outgassing effects compared to other methods
- Small sample volume allows more frequent pH checks or more culture volume for other samples
- Compact size minimizes increase in system footprint



Integrated Cell Counter

Either Beckman Coulter Vi-CELL XR or Roche Cedex HiRes cell counter can be directly connected to a sample cup located on the deck of the Ambr® system. Sample transfer and cleaning steps are handled by the syringe pump on the cell counter, which is normally located outside the Ambr® biosafety cabinet.

Sartorius do not provide the cell counter systems, these have to be purchased separately from the relevant supplier. For connection of a new or existing Vi-CELL XR or Cedex HiRes cell counter, a field integration is required and will be performed by Sartorius.

The benefits

- Improved consistency of results compared to manual sample transfer of samples
- Enables walk away operation and out of hours cell counts e.g. at night
- A software (data) connection allows results to be recorded and used within the Ambr® software
- Control actions e.g. feed additions can be calculated and executed based on cell counts
- Can be integrated in parallel with Ambr® Analysis Module



Nova Biomedical BioProfile® FLEX2

Integration of the FLEX2 with Ambr® systems provides a comprehensive walk away capability for fully automated cell culture process operation, including sampling, assay, feedback control and data management.

The FLEX2 External Sampling Module (ESM) automatically transfers cell culture samples from a sample cup on the Ambr® system deck to the FLEX2 for analysis. FLEX2 results are transferred to Ambr® software and the Ambr® system records the data and can also carry out a range of feedback control calculations and actions.

Ambr® systems are provided by Sartorius; the FLEX2 and ESM are provided by Nova Biomedical; connection (field integration) of the systems takes place in the user laboratory.

The benefits

- Comprehensive analysis of up to 16 culture parameters
- Assay panels are defined via FLEX2, selected via Ambr®
- Fully automated sampling, sample transfer and analysis, data transfer and automated feedback control
- Typical control actions can be executed using FLEX2 results e.g. glucose or feed addition based on glucose, cell count, IVC or other parameters
- Simplified data management workflow reduces errors and scientist workload



Nova Biomedical BioProfile® FLEX2 and ESM



BioPAT® Spectro in Ambr®

BioPAT® Spectro in Ambr® enables the automated integration of Raman spectrometers from Endress+Houser Optical Analysis, Inc and Tornado Spectral systems, via a Sartorius-specific fiber optical probe.

BioPAT® Spectro in Ambr® Benefits

- Automated consolidation and contextualization of all spectral and process data into a SIMCA®-ready file for model building
- Ambr® derived Raman models are more robust due to the use of all process data, a large DOE design space, and automated spiking of Ambr® samples with analyte stock solutions
- Ambr® can use SIMCA® models to predict analyte concentrations and execute process control in real time



BioPAT® Spectro flow cell with Endress+Houser Optical Analysis, Inc probe connected



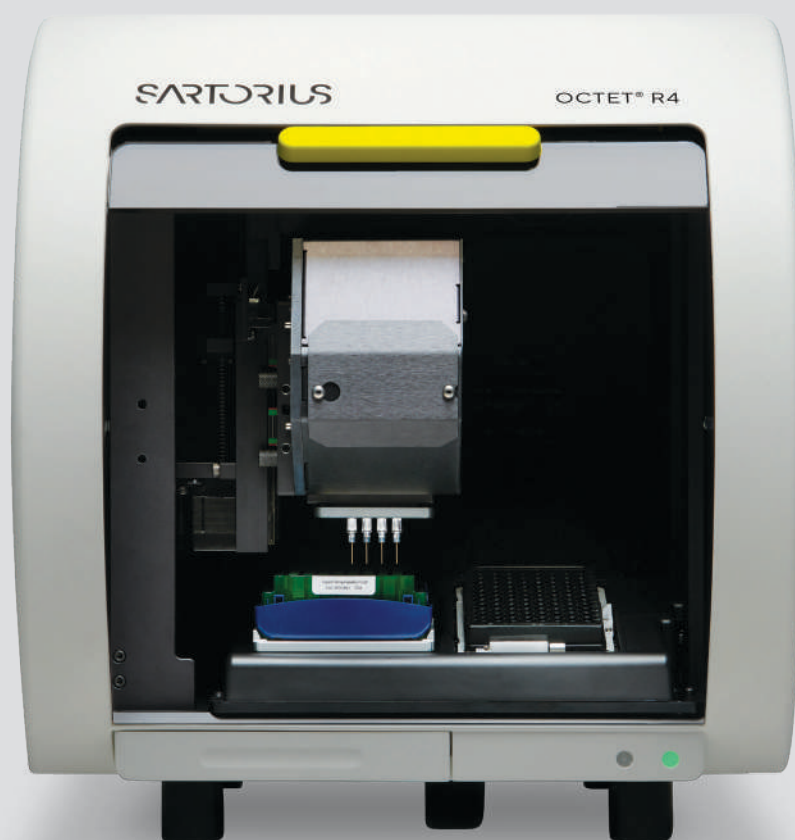
BioPAT® Spectro flow cell with Tornado Spectral Systems probe connected

Octet® Label-Free Detection Systems

Octet® systems enable real-time, label-free analysis for the determination of kinetics, affinity, and antibody/protein quantitation. The Octet® provides robust monitoring of biomolecular interactions to overcome limitations in throughput, performance, and cost associated with traditional technologies. These fluidics-free, low maintenance and sensitive systems increase lab productivity, reduce costs, and shorten experimental timelines.

Octet offers:

- Protein titer, binding kinetics and affinity quantification
- Relative glycan level analysis
- Automated analysis for faster time to results
- Continuously monitored binding interactions so you don't miss out on subtle kinetic behavior patterns
- Analytes can be measured in crude, unpurified mixtures such as Ambr® bioreactor samples
- Simple, integrated user interface designed for biologists, so you spend less time learning instrumentation and more time deriving insights



Waters™ BioAccord™ LC-MS

Mass spectrometry (MS) is now a fundamental part of biopharma workflows for attribute-based analysis. This attribute monitoring role has application across the breadth of product and process development and has expanded beyond the core lab and into bioprocess and Quality Control (QC) labs.

The Waters BioAccord System provides appropriate sensitivity, mass resolution and selectivity for directly analyzing biomolecules in the form of native proteins, denatured proteins, peptides, nucleic acids, labeled glycans and cell culture media analytics. This provides biopharmaceutical organizations with deeper insights across drug development and commercial operations. With MS data confirming product identity, revealing product and process variation, and assessing structure and interactions of a biomolecule, project pipelines can advance faster and reduce the time to market for potential drugs.



Availability and Compatibility

Availability	Ambr® 15 Cell Culture	Ambr® 250 High Throughput	Direct Integration	Data Connectivity
Ambr® Analysis Module (pH)	x	x	x	
Ambr® Analysis Module (BioPAT® Spectro) Endress+Houser Optical Analysis, Inc Raman Rxn2	x	x	x	
Ambr® Analysis Module (BioPAT® Spectro) Tornado Spectral Systems HyperFlux PRO 785	x	x	x	
Beckman Vi-CELL XR	x	x	x	
Roche Cedex Hi-Res	x	x	x	
Nova Biomedical BioProfile® FLEX2	x	x	x	
Sartorius Octet®	x	Not yet available		x
Waters BioAccord	x	Not yet available		x

Sample Volume and Cycle Times


Analyser	Ambr® 15 Cell Culture		Ambr® 250 High Throughput	
	Sample Volume	Cycle Time	Sample Volume	Cycle Time
Ambr® Analysis Module (pH)	60 µL	160 sec	200 µL	160 sec
Ambr® Analysis Module (BioPAT® Spectro) Endress+Houser Optical Analysis, Inc Raman Rxn2	110-200 µL	5-15 min	110-200 µL	5-15 min
Ambr® Analysis Module (BioPAT® Spectro) Tornado Spectral Systems HyperFlux PRO 785	110-200 µL	5-15 min	110-200 µL	5-15 min
Beckman Vi-CELL XR	550 µL	4-5 min	550 µL	4-5 min
Roche Cedex Hi-Res	300 µL	4-5 min	300 µL	4-5 min
Nova Biomedical BioProfile® FLEX2	400-500 µL	6-7 min	400-700 µL	7-8 min
Sartorius Octet®	User Defined	Assay Dependent	Not yet available	Not yet available
Waters BioAccord	User Defined	Assay Dependent	Not yet available	Not yet available

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