

Ambr® 250 High Throughput Generation 2

The Industry Standard High Throughput Bioreactor System, Optimized for Process Characterization



Product Information

The Ambr® 250 High Throughput Generation 2 is a multi-parallel bioreactor system that accelerates process development and characterization timelines and reduces costs. The platform includes a fully continuous gas supply system, matching large-scale bioreactors and optimizing scale-down models. Integrated analytics options, including capacitance-based BioPAT® Viamass, support diverse feedback control.

The powerful, flexible control software streamlines user workflows and supports data integrity requirements. Embedded cameras facilitate system monitoring, user interactions, and process robustness.

Features and Benefits

- Automated workstation with liquid handler for up to 24 single-use 250 mL bioreactor vessels
- Continuous gassing matches larger scales and improves process control
- Many analytical options, including BioPAT® Viamass
- User-friendly interface with enhanced data integrity
- Integrated cameras improve user interactions and system robustness

Introduction

The Ambr® 250 High Throughput Generation 2 is an automated, high-throughput bioreactor system designed to streamline bioprocess development and optimization. Supporting both cell culture and microbial fermentation applications, it enables efficient process characterization, clone selection, and media development. With its advanced parallel processing capabilities, the system facilitates scale-down model development, fed-batch and perfusion studies, and comprehensive design of experiments (DoE) in a single run—helping you accelerate workflows and drive innovation in bioprocessing.

Relevant Applications

- Bioreactor design of experiments studies in a single run
- Fed-batch cell culture
- Perfusion cell cultures
- Suspension, microcarrier, and cell aggregate cultures
- Microbial fermentation

Relevant Process Steps

- Scale-down model development and qualification
- Early- and late-stage process development
- Process characterization studies
- Clone or strain screening and selection
- Media development

System Overview

The Ambr® 250 High Throughput Generation 2 is a comprehensive solution that includes the main workstation with various process and analytical options, a system control PC with dedicated software, and a choice of single-use bioreactor vessels and other consumables.

Software

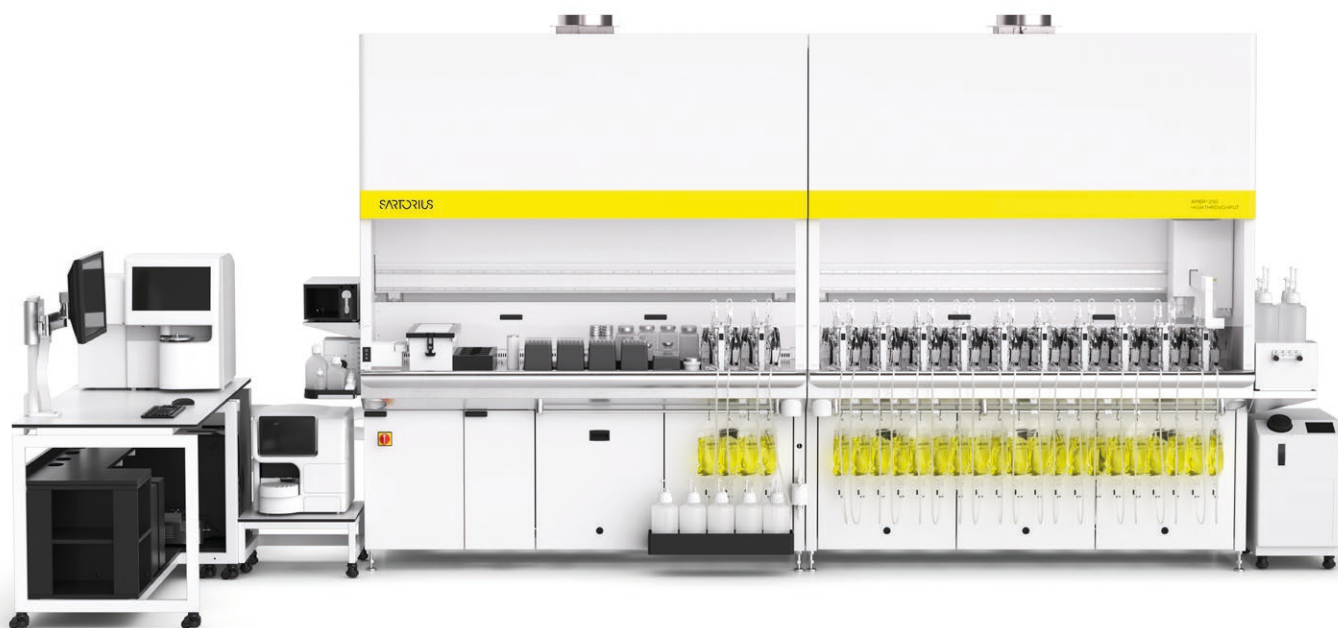
The flexible and powerful control software has been optimized to streamline user workflows and provide an intuitive user experience. The user interface retains the same core functionality as the first-generation solution and includes new features, including a new Help Center and support for data integrity requirements.

Process Options

The system supports diverse process options, including perfusion cell culture, a freezer for pipetted samples, automated cleaning of reagent pump lines and used pipette tips, plus a chiller to support system cooling requirements.

Analytical Options

Analytical capabilities include embedded online monitoring of various parameters in the bioreactor vessels and exit gas lines, plus integration of third-party cell culture analyzers for cell counting and metabolite analysis. For details see the [**Ambr® brochure Integrated Cell Culture Analyzers**](#).



Single-Use Bioreactor Vessels

The bioreactor vessels are designed to be easy-connect and are available for a wide range of applications. They are available in configurations with either baffled dual 20 mm pitch-blade (mammalian) or Rushton (microbial) impellers or unbaffled with a single elephant-ear pitched-blade impeller. Perfusion vessels come equipped with a microsparger, pressure sensors, pump chambers, and tubing for either tangential flow filtration (TFF) or alternating tangential flow (ATF) filtration. All vessels include feed lines, a dissolved oxygen sensor, and a pH probe. Some vessel variants are available with additional single-use sensors for direct monitoring within the bioreactor – for further information, see the **Ambr® 250 High Throughput brochure Consumables and Accessories**.



Ambr® 250 High Throughput Mammalian vessel with dual pitch-blade impeller



Ambr® 250 High Throughput perfusion TFF vessel with 0.2 µm filter

Technical Specifications

Operating Parameter	Specification
Agitation speed	100 – 4,500 rpm
Culture temperature	18 – 65 °C ± 0.5 °C
Post-culture period chilling	6 – 8 °C
Temperature shift rate	≥ 5 °C per 30 mins
pH range	2.0 – 8.5
pH monitoring accuracy	± 0.02 pH units
DO (% air saturation) monitoring range	0 – 200%
DO monitoring accuracy	± 2% @ 100%
pCO ₂ monitoring range	15 – 200 mmHg
pCO ₂ monitoring accuracy	± 10% or 10 mmHg after 1pt calibration
BioPAT® Viamass monitoring range (cell culture duration tested)	0–400 pF/cm (up to 30 days)
Cell culture gas configuration	Air/N ₂ , O ₂ , and CO ₂
Microbial gas configuration	Air, N ₂ , and O ₂
Maximum sparged gas flow (total)	750 mL/min
Maximum headspace gas flow (per gas and total)	60 mL/min
Gas flow monitoring accuracy	± 5% @ > 50 mL/min
Exhaust gas CO ₂ monitoring	0 – 20%
Exhaust gas CO ₂ monitoring accuracy	± 5% @ 5% CO ₂
Exhaust gas O ₂ monitoring	0 – 50%
Exhaust gas O ₂ monitoring accuracy	± 2% @ 21% O ₂
Dispense pump flow rate with in-line filters	0 – 10 mL/hr (viscosity dependent)
Dispense pump flow rate (without in-line filters)	0 – 100 mL/hr (except antifoam, viscosity dependent)
Dispense pump flow rate accuracy	± 5% > 20 µL/hr
Dispense pump volume accuracy	± 5% > 10 µL
Independent pumps per vessel	4 (perfusion option: 3 for feeding, 1 for permeate)
1 mL tip sample volume per aspirate	30 – 950 µL (at > 170 mL working volume, if from bioreactor)
10 mL tip sample volume per aspirate	0.5 – 9.5 mL
Chilled sample temperature control	4 – 8 °C or ambient
Frozen temperature control	–20 °C

Bioreactor Vessels	Specification
Construction material	Polycarbonate, polypropylene, polyethylene
Dimensions	60 mm internal diameter, 120 mm internal height
Total volume	350 mL
Working volume	100 – 250 mL

Bioreactor Parameters	Cell Culture	Perfusion	Microbial
Baffles	4 (or 0)	4	4
Number of impellers	2 (or 1)	2	2
Impeller type	Pitched-blade (or elephant-ear)	Pitched-blade	Rushton
Impeller diameter	26 mm (or 30 mm)	26 mm	20 mm

Perfusion Parameters	Specification
Crossflow rate range	0 – 100 mL/min
Flow path smallest ID	2.0 mm
Crossflow pump stroke volume	10 mL
Perfusion crossflow loop working volume	7 – 17 mL ATF 23 mL TFF
Bioreactor working volume (with bleed to level)	210 mL
Permeate flow rate	0.1 – 4.0 VVD
Automated bleed volume	5 mL per bleed

Ordering Information

System Option Field Upgrade	12-Way System	24-Way System
Ambr® 250 High Throughput system package	001-8G101-P	001-8G102-P
Ambr® 250 High Throughput integrated analytics furniture. A set of laboratory benches tailored for Ambr® 250 High Throughput control PC, monitor, and integrated third-party analyzers	001-8G130	001-8G130
Online BioPAT® Viamass (capacitance) option for a new Ambr® 250 High Throughput system. For use with BioPAT® Viamass enabled vessels in cell culture applications	001-8G105-P	001-8G106-P
Ambr® 250 High Throughput Perfusion. Optional capability to support perfusion cell culture using fully integrated single-use perfusion bioreactors	001-8G23-P	001-8G24-P
Online pCO ₂ measurement. Enables real-time continuous monitoring of cell culture pCO ₂	001-8G103	001-8G104
Integrated exhaust gas analysis (exit gas O ₂ and CO ₂ sensors)	001-8G03	001-8G04
Online biomass measurement. Real-time continuous growth monitoring for microbial processes	001-8G80	001-8G81
Integrated external analyzers*: Ambr® Analysis Module for pH and BioPAT® Spectro, Beckman Coulter Vi-CELL BLU, Nova Biomedical BioProfile® FLEX2	—	—
AutoCIP module. Fully automates reagent switching during the pump clean-in-place cycle, reducing hands-on time	001-8G70	001-8G70
On-deck sample freezer. Enables the user to freeze and control sample temperature from –20 °C to ambient	001-8G06	001-8G06
Self-contained chiller unit for providing bioreactor cooling	001-8G08	001-8G08
External condensing. Enables excess liquid to be stripped from the culture	001-8G27	001-8G28
Portable hand-held priming controller	001-8G07	001-8G07
Ambr® 250 automated pipette rinse. Allows rinsing of pipettes with decontamination liquid before disposal	001-2G63	001-2G63

Additional options for external data integration are available. Please contact your local representative for information. For available consumables, please see brochure [Ambr® 250 High Throughput Consumables and Accessories](#).

*For details see [Ambr® brochure Integrated Cell Culture Analyzers](#).

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