ambr® 250 modular
Single-Use Benchtop Bioreactor with Simplified Operation for Increased Productivity
New Advanced Benchtop Bioreactor System for Parallel Microbial and Cell Culture

*ambr*® 250 modular is an innovative new high performance benchtop bioreactor system for parallel microbial or cell culture in 100 - 250 mL single-use vessels. The system utilizes the same advanced stirred tank bioreactor technology pioneered in the original *ambr*® 250 high throughput system. The system comprises a series of elegantly designed benchtop modules enabling 1 to 8 bioreactors to be operated in parallel and a control module with intuitive system software accessed via a user-interface screen.

- **Productivity**
  Each single-use bioreactor vessel is fully integrated with sensors, liquid reservoirs and syringe pumps which make it possible for experiments to be set up and turned around rapidly. A single user can operate up to 8 bioreactors at a time.

- **Scalability**
  Because the bioreactor vessels are geometrically similar to larger bioreactors, all processes on the system can be scaled up to those of large bioreactors making for optimum scalability.

- **Ease-of Use**
  Due to the unique integrated single-use design of the vessel, with probes, pumps and reservoirs the user can focus on the process and not the set-up. There is no need to connect multiple tubes or filters or to autoclave the vessels and accessories.

- **Expandable**
  The modularity of the system means that it can be extended to meet the needs of an expanding company.
New ambr® 250 modular
ambr® 250 modular System Combines 1 to 8 Bioreactor Stations and a Control Module with System Software

The modular design is expandable up to 8 bioreactors.

**Bioreactor module**
Holds 2 bioreactor stations. Up to 4 modules can be connected to the controller.

**Fast-loading peristaltic pump**
Accessible for each bioreactor, provides an alternative route for feeding and harvesting. This is in addition to the 5 integrated syringe pumps in each bioreactor.
Chilled liquid reservoir
Chills liquids to temperatures between 6-8°C ensuring temperature sensitive media can be maintained.

3 step ‘Easy Connect’ installation for all gas, liquid and sensor connections
- Step 1 - slot in
- Step 2 - secure with clamp
- Step 3 - secure pH connector
Enabling quick set-up and rapid turnaround.

Touch screen user-interface
Enabling easy control and supervision of multiple bioreactors.

Bioreactor controller
Manages all processes including pH, temperature and DO for up to 8 bioreactors. Fully integrated foam control.

Optional off-gas analyzer
Monitors and controls processes using data from individual bioreactors’ exhaust gases.
ambr® 250 modular Bioreactor Vessels

Each bioreactor is fully integrated with 5 liquid reservoirs and proprietary single-use syringe pumps. The integration simplifies experimental set-up, eliminates any need for vessel sterilization, and significantly reduces any error due to manual handling.

**Vessel scalability**
Vessels are geometrically similar to standard bench and pilot scale bioreactors, enabling straightforward scale-up.

**Single-use mammalian or microbial bioreactors**
- 100 - 250 mL working volume.
- Dual pitch blade or Rushton impellers.
- Spot based DO sensor.
- Disposable pH electrode.
- Integrated gas inlet filters.
- Sparge and headspace gassing options.
- Integrated exhaust gas condenser.

**Integrated liquid reservoirs**
- 2 Integrated 125 mL reservoirs per bioreactor
- 3 Integrated 50 mL Reservoirs per bioreactor.

**Single-use syringe pumps**
Each reservoir is integrated to its own high precision syringe pump allowing for highly consistent and accurate liquid delivery.

**Visible liquid addition lines**
Allow view of liquid during auto-priming.
**Septum cap**
Allows for rapid liquid additions with a syringe.

**Gas tube**
Gases can either be delivered into the headspace or sparged into the media. These delivery systems are independent and can function in parallel.

**Fully integrated liquid lines and reservoirs**
Allowing for rapid experimental set-up and turnaround.

**Single-use pH and DO sensors**
Both pre-calibrated, the DO spot measures 0 - 200% and the standard pH probe has a measurement range of 2 - 8.5.

**Double impeller – Rushton or pitch-blade**
For microbial or mammalian vessels respectively.
ambr® 250 modular software encompasses 4 applications all of which enable export and import of data to/from different sources.

ambr 250 modular is supplied with the same advanced software as the established ambr 250 high throughput system. Users can design new and complex experiments and analyze results easily and quickly.

**Software**

**ambr® 250 modular**

Historian application which enables users to fully analyze experiments looking at audit trails, all variables and completed recipes.

**Experiment Viewer**

Comparison of plots from experiments run at different times – allows parameters from multiple experiments to be plotted together on the same graph.

**Results Viewer**

**Process Definition**

Simple ‘drag and drop’ process steps for quick and easy definition of experiments.

**Runtime**

Monitoring and adjustment of all process parameters in real time, for each individual bioreactor.
ambr® 250 modular automatically controls and adds liquids to 1 to 8 bioreactor | fermenter vessels in parallel

**Bioreactor controller**
- Three gases per bioreactor with mass flow sensor:
  - Mammalian
    - O₂
    - CO₂
    - N₂ | air
  - Microbial
    - O₂
    - Air
    - N₂
- Five positive displacement liquid pumps per bioreactor for high precision at low flow rates.
- Individual bioreactor temperature control with heating and cooling.
- Individual impeller speed control per bioreactor.
- Optional off-gas analysis by BioPAT ambr Xgas for CO₂ and O₂, also uses OUR and CER measurements.

**Functions**

**Applications**

ambr® 250 modular is configurable for microbial or mammalian cell culture and is used in R&D across biopharm and industrial biotech for the following applications:

- Process optimization.
- Process characterization.
- Process robustness experimentation in support of QbD studies.
- Process scale-down model.
Scalability

Single-Use from Cell Line and Process Development to Production Scale

- Geometrical similarity of vessel design
- Consistent mixing and gassing strategies
- Reliable single-use platform

ambr® 250 modular
BIOSTAT® B
Univessel® SU 2L

BIOSTAT® STR 50

Similar geometry and sensors -

Process development
Similar geometry and sensors - scaling up from 0.25 L to 1000 L

Production

Also scalable to glass and stainless steel bioreactors

BIOSTAT® STR 200

BIOSTAT® STR 500

BIOSTAT® STR 1000
For further contacts, visit www.sartorius-stedim.com