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Biopex A

Bioreactor | Fermenter

TECHNOLOGY

Biopex A

Unopex manufactures high quality bioreactors | fermenters.

The Biopex A Bioreactor | Fermenter has been designed and constructed for a full range of application possibilities.

The Biopex A consists of a culture vessel for cultivation and a control tower to run operation. Configurations are available for microbial or cell culture productions, twin or parallel cultivation.

It is a complete package that enables both beginners and experienced users to easily perform applications.

Industries

- Biotechnology
- Pharma
- Agriculture
- Food
- Academia

Operation Modes

- Batch
- Fed-batch
- Continuous
- Perfusion

Applications

- Microbial fermentations
- Tissue culture
- Enzymes
- Vaccines
- Process development
- Optimization and characterization
- Academic studies

Cells

- Mammalian cells
- Insect cells
- Microorganisms
- Yeast cells
- Fungal cells
- Plant cells

Exhaust Cooler

Preventing liquid loss through evaporation

Operating Panel

10" touch screen for reliable operation

Stirrer Motor

Servo motor with single mechanical seal

Control Tower

Customized designs for single, twin or parallel cultivation

Vessel Stand

Stainless steel stand designed for simple and fast installation

Peristaltic Pumps

Integrated peristaltic pumps for stable and reproducible flow rates

Culture Vessel

Autoclavable borosilicate glass

Sensor Connections

Easy-to-cable, clearly named sensor inputs

Gassing System Connections

Quick connect couplings for individual gas supply

KEY FEATURES

- Compact system with small footprint
- Scalable culture vessels
- Simple and fast installation
- Quick and easy operation
- Visible process due to glass assembly
- Display and easy setting of the process parameters via fully automated touch screen
- Up to 5-stage advanced cascade system for pO2 control
- Modifiable PID settings for stirrer, temperature, pO2 and pH
- Dead band settings for flexible control
- Up to 5 integrated peristaltic pumps
- Calibration of pH and pO2 sensors via touch screen
- Safe sampling system to reduce contamination risk
- Trend display for process values with data saving option
- Customized alarms and safety features for reliable cultivation
- Configurable for parallel cultivation up to 6 units
- All metal surfaces in contact with product: AISI 316L
- CE compliant
- Application and training service

Technical Specifications

Model	Biopex A		
VESSEL	Working Volume	1 L	0,3 ..... 1 L
		2L	0,6 ..... 2 L
		5L	0,8 ..... 5 L
		10 L	1,4 ..... 10 L
CONTROL TOWER	Pumps	acid, base, antifoam/level, feed/harvest	
	Operating Panel	touchscreen	
	Size (W x D x H)	300 x 450 x 750 mm	
AGITATION	Range of Speed	1 L	0 ..... 2.000 rpm
		2L	0 ..... 2.000 rpm
		5L	0 ..... 1.500 rpm
		10 L	0 ..... 1.500 rpm
	Impeller Type	6-blade Rushton impeller (microbial version) 3-blade segment impeller (cell culture version)	
GASSING	Gas Control	mass flow controllers with valves for: air, O2 (microbial version) air, O2, N2, CO2, head space gassing (cell culture version)	
	Gas Filters	resterilizable inlet and outlet filters	
TEMPERATURE	Control Range	single-wall	20 ... 60 °C
		double-wall	20 ... 60 °C
SENSORS	pH	controlled by peristaltic pumps acid and base (microbial version) CO2 and base (cell culture version)	
	pO2	controlled by multiple cascade system air - O2 - N2 - stirrer speed - feed	
	Foam/Level	controlled by peristaltic pump afoam/level	
	Temperature	controlled by: heating blanket & cooling finger (single-wall vessel) thermal circulator (double-wall vessel)	
CONNECTION	Computer Connection Data Transfer	ethernet / usb	
SPACE REQUIREMENTS IN AUTOCLAVE	Autoclavable Size with Exhaust Cooler (W x D x H)	1 L	175 x 190 x 450 mm
		2L	210 x 210 x 505 mm
		5L	240 x 245 x 655 mm
		10 L	270 x 310 x 800 mm

COMPONENTS

Culture Vessel

- available in four different sizes: 1 L, 2 L, 5 L and 10 L
- single-wall and double-wall options
- selectable for all kinds of applications:
  - microbial
  - cell culture
- round-bottom vessels without any dead space
- saving valuable space in autoclaves

Head Plate

- smart layout for easy access to all ports
- knurled screws for fast installation
- ports for all required accessories
- triple/quadruple port for reagent addition
- extra free ports

Stirrer

- up to three 6-blade Rushton impeller for homogeneous and intensive mixing (microbial version)
- up to three 3-blade segment impeller for homogeneous and efficient mixing of shear sensitive cells (cell culture version)
- stirrer shaft with single mechanical seal and direct coupling for contamination-free operation

Sparger

- distribution of gas bubbles through culture medium
- ring sparger for intensive gassing (microbial version)
- micro sparger for gentle gassing (cell culture version)

Control Tower

- one control tower for all optional vessel sizes
- fully automated colored 10" touch screen operating panel
- equipped with up to 5 integrated peristaltic pumps with fixed/variable speed
- up to 3 optional external pumps
- quick couplings for connecting supplies and accessories
- customized designs for single, twin or parallel cultivation

Operating Panel & Software

- user-friendly software for monitoring and operating the entire process
- customized user and system settings for the best performance
- easy setting and precise control of process parameters
- monitoring set and actual values of all parameters during operation
- properly defined alarms for absolute safety
- real-time and continuous trend display of all process parameters
- data storage and reporting for comparison of experiments and process optimization
- intuitive calibration menu for pumps and pH & pO2 sensors
- compliance option 21 CFR Part 11
- multiple language alternatives
- remote access and control

Sensors

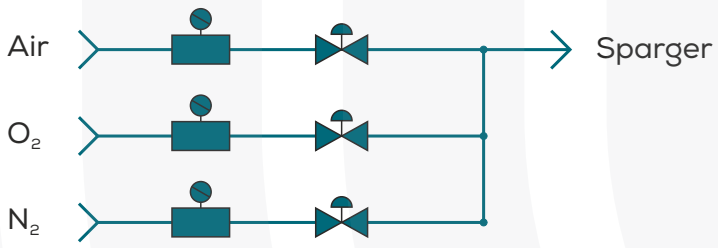
- sterilizable sensors for precise measurement and control of parameters
  - pH
  - pO2
  - temperature
  - foam/level
- simple connections for both head plate and control tower
- calibration method selection and status monitoring of pH and pO2 sensors via touch screen

COMPONENTS

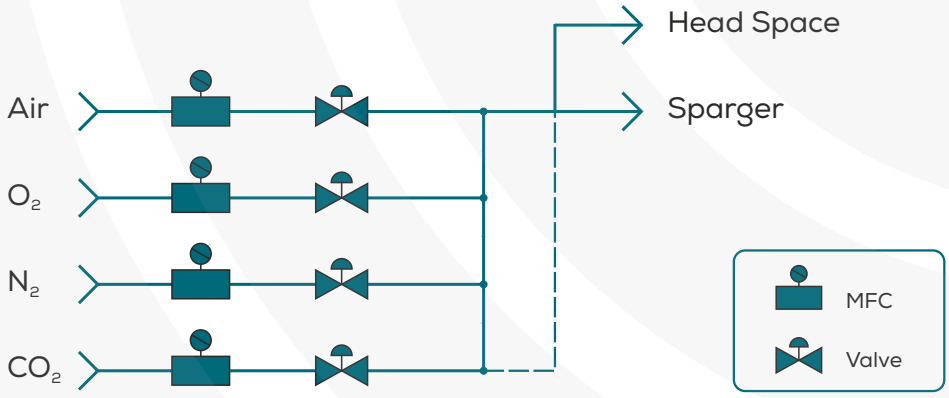
Gassing System

- automatic and reproducible control of the desired gas flowrates with individual built-in mass flow controllers
  - air, O2, N2 (for microbial version)
  - air, O2, N2, CO2 and head space gassing (for cell culture version)
  - free selection and mix of gas types
  - individual gas flow paths
  - easy set-point adjustment
  - transferred gas volume totalizers
  - low & high flow rate limits
- ultimate flexibility and accuracy with adjustable gas flow during operation

Gassing Strategy for Microbial Fermentations



Gassing Strategy for Cell Culture Applications



Cascade Control

- multiple cascade strategy to control the concentration of dissolved oxygen (pO2)
- individual settings and activation for cascade parameters
  - gas addition (air / O2 / N2)
  - stirrer speed
  - feed

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Biopex A	Microbial Fermentations	Cell Culture Applications
Size: 1 L | 2 L | 5 L | 10 L	●	●
Single-wall culture vessel		●
Double-wall culture vessel	●	
Touch screen operating panel	●	●
Temperature sensor	●	●
pH sensor	●	●
pO2 sensor	●	●
Foam/Level sensor	●	●
Up to 5-stage cascade control	●	●
Up to 5 integrated pumps	●	●
Stirrer with servo motor	●	●
6-blade Rushton impeller	●	
3-blade segment impeller		●
Exhaust cooler	●	●
Sterilizable gas filters	●	●
Heating blanket		●
Cooling finger		●
Mass Flow Controllers with valves	●	●
Ring sparger	●	
Micro sparger		●
Removable baffle	●	
Reagent bottles	●	●
Bottle holder	●	●
Tubing-clamp-sealing set	●	●
Triple/Quadruple port	●	●
Adjustable dip tube for feed/harvest	●	●
Resterilizable sampler	●	●
Operating & Maintenance Manual	●	●

CONFIGURATION

Biopex A *twin*

- twin configuration with two culture vessels and one control tower
- independent operation of two culture vessels with one control tower
- ability to work in different volumes 1 L | 2 L | 5 L | 10 L
- comprehensive process management due to parallel cultivation
- continuous real-time trend display for each culture vessel
- control tower equipped with
  - touch screen operating panel
  - software for operation up to 2 independent vessels
  - up to 8 fixed/variable speed pumps
  - up to 6 external peristaltic pumps
  - stirrer and sensor connections
  - quick couplings for connecting gas supplies and accessories

Biopex A *poly*

- poly configuration with up to 6 culture vessels, one supply tower per vessel and one control tower
- ideal bioreactor system for process optimization at laboratory scale
- independent operation of all culture vessels with one control tower
- ability to work in different volumes 1 L | 2 L | 5 L | 10 L
- reduced process development time
- continuous real-time trend display for each culture vessel
- control tower equipped with
  - touch screen operating panel
  - software for operation up to 6 independent vessels
- supply tower equipped with
  - up to 4 fixed speed peristaltic pumps
  - up to 4 variable speed pumps
  - up to 3 external peristaltic pumps
  - stirrer and sensor connections
  - quick couplings for connecting gas supplies and accessories

Options

- Integrated thermal circulator for temperature control
- Additional mass flow controllers/rotameters
- External pumps
- Desktop computer & printer
- Automatic weight control
- Gravimetric flow control
- Gravimetric level control
- Tangential flow filtration (TFF)
- Turbidity sensor
- Conductivity sensor
- ORP measurement
- IQ/OQ documentation

Scale Up

Benchtop bioreactors are useful for initial trials. The results from a successful test conducted on the Biopex A Benchtop Bioreactor can be utilized in the scale-up procedure to pilot and industrial production.

Biopex A Benchtop Bioreactor

Biopex C Pilot Scale Bioreactor

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Achieving Together

We are thrilled to contribute to researchers and producers all over the world to easily realize their projects that protect nature and serve humanity with our expertise, experience, motivation, talent, product and services.

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