Cultivation Systems

From Discovery to Production

GETINGE

Sustainable Life Science

Passion for all dimensions of Life

Together with our partners and customers, we do everything we can to improve on dimensions of life: Planetary Life, Human Life, Patient Life, Professional Life, Business Life and Societal Life.

To improve on Planetary Life for example, and to give us all a healthier and better future, we aim to do all we can to minimize our impact on the environment. We channel our efforts into a set of initiatives, carried out in collaboration with stakeholders across our value chain.

Getinge is committed to becoming a net-zero company by 2050 across the full value chain and our targets have been approved by the Science Based Targets initiative. Getinge has signed the UN Global Compact and we support its ten principles on human rights, labor, environment and anti-corruption. Our sustainability work is governed by our Code of Conduct and a number of policies such as human rights, anti-corruption and the environment.

Read more on www.getinge.com

SUSTAINABLE DEVELOPMENT GOALS

UN GLOBAL COMPACT WE SUPPORT

ecovadis Business Sustainability Ratings

Creating innovations that improve people's quality of life – and save lives

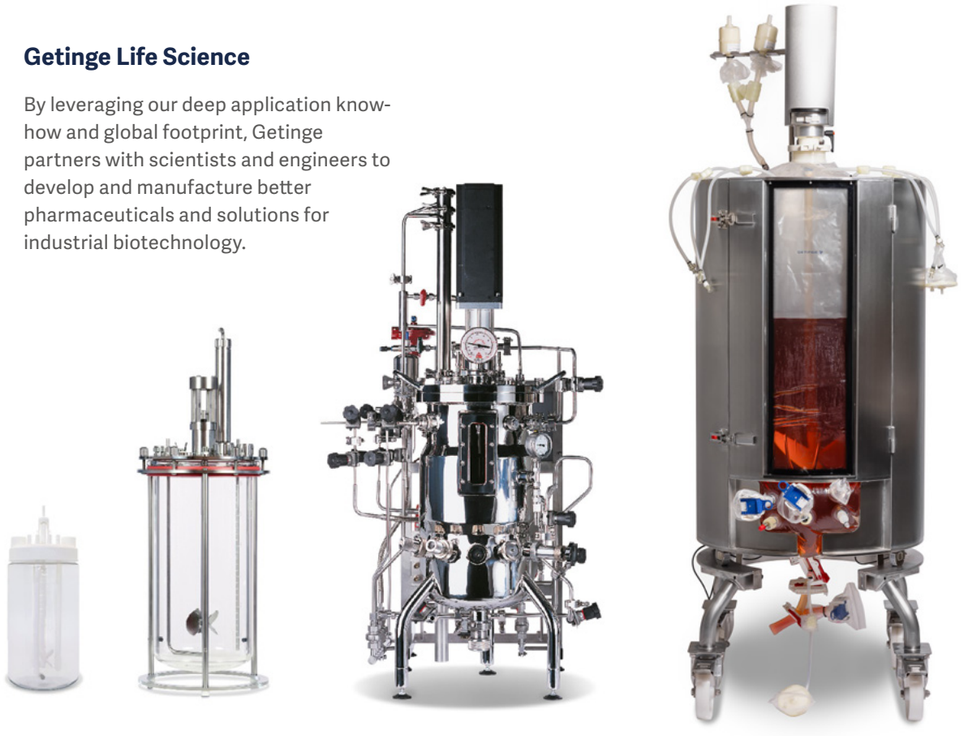
With a firm belief that every person should have access to the best possible care, Getinge provides hospitals and life science institutions with products and solutions aiming to improve clinical results and optimize workflows.

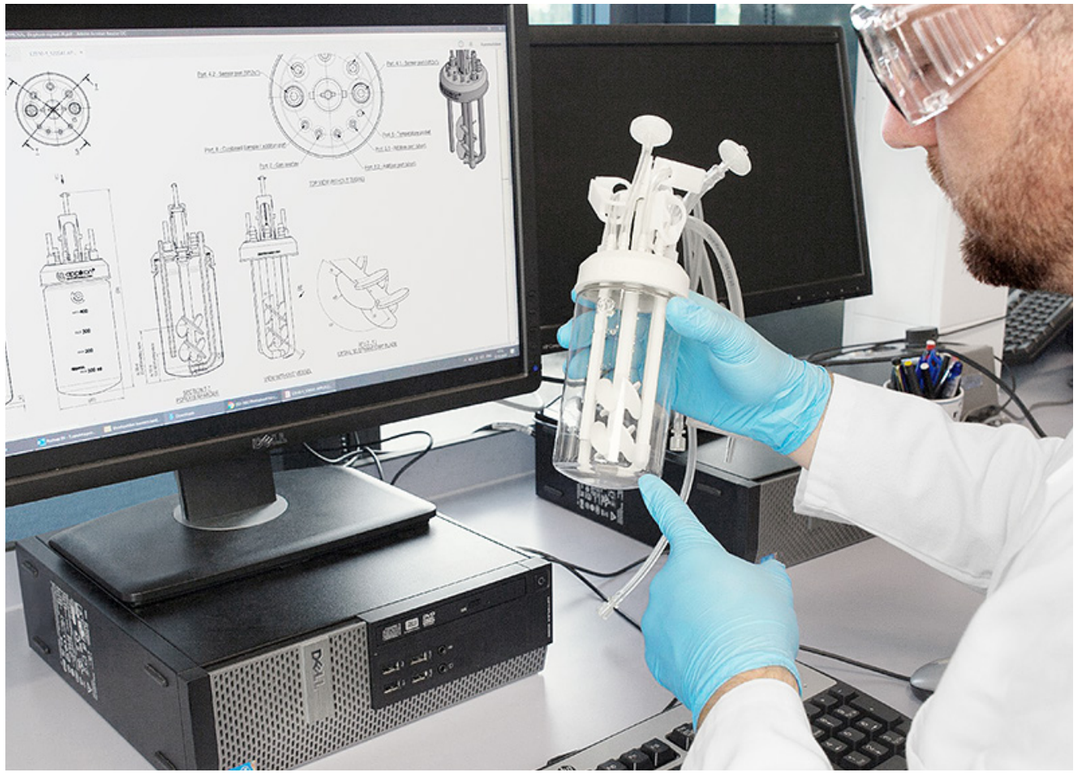
The offering includes products and solutions for intensive care, cardiovascular procedures, operating rooms, sterile reprocessing and life science. Getinge employs over 11,000 people worldwide and the products are sold in more than 133 countries.

We focus on upstream bioprocessing and contamination prevention to provide tailored, efficient and compliant solutions to our customers and partners who are dedicated to prevent, mitigate and cure diseases - save lives.

Getinge Life Science

By leveraging our deep application know-how and global footprint, Getinge partners with scientists and engineers to develop and manufacture better pharmaceuticals and solutions for industrial biotechnology.





Partner of Choice

For the life science industry

Our aim is to support scientists, (cell)biologists, lab managers and operators achieve their goals: Improving quality of life.

Our bioreactor system portfolio covers the whole upstream bioprocess, ranging from laboratory scale and pilot plant scale to production scale. Whatever your application is, we have the right products for you to optimize the growth of cells and bacteria that is key to the production of life-saving products.

Vaccines

Bio-Pharma-ceuticals

Regenerative Medicine

Food and Beverages

Bio-Chemicals

Bio-Fuels

Contents

Applikon

– Multi-use Bioreactors for Lab-scale

In the laboratory bioreactor and fermentor segment, Getinge is a worldwide market leader because of its flexible and easy-to-use systems. These glass autoclavable bioreactors are suitable for both cell and microbial culture applications and can easily be upgraded if a change in research activities occurs.

Our Applikon range excels in quality and modularity. The systems are built according to the specific demands of a process, using an extensive array of high-quality components. Because of the modularity and flexibility, the user can always adapt the systems to changed process demands. This results in low initial investment and low running costs.
The Applikon stirred tank reactor (STR) is the most widely used bioreactor type. Applikon bioreactors and fermenters are available in a range from 250 mL up to 20 L total volume.

Benefits:

- Save time through simple set-up and easy handling
- Easy cleaning due to electropolished finish of product surfaces
- Widely applicable and easily scalable through broad range of volumes to fit many applications
- Flexibility with interchangeable modules to tailor the systems to research demands

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Related products:

- AppliSens sensors
- BioSep
- my-Control
- Livit Flex
- V-Control software
- Lucullus software

Features:

- Configurable headplates with interchangeable ports
- All metal parts are constructed of stainless steel 316L
- Optional high torque magnetically coupled agitator for 2 – 20 L range
- External mirror polished finish
- Glass bioreactor vessels can be used up to 0.5 barg (7.5 psig) of overpressure
- Jacketed bioreactor option for 2 – 15 L range
- Glass dished bottom vessels are made of borosilicate glass to guarantee:
- Resistance to thermal shock
  - Excellent corrosion resistance
  - Smooth, non porous surface for easy cleaning
  - Optimal transparency for visual inspection of the culture

Small scale range

The Applikon bioreactor range includes true scale down models of the classic 3 L laboratory scale bioreactor. These devices, ranging from 250 mL up to 1000 mL, are perfect for small-scale operations in the lab. The low volume reduces media costs, and the small size maximizes usage of bench space. The configurable head plate of the bioreactor has Luer fittings that free up space for multiple additions, sensors and fittings and ready-to-go tubing assemblies for a quick start.

Specifications (Part 1/3):

	250 mL	500 mL	1000 mL
Total volume (L)	0.290	0.550	1.250
Working volume (L)	200	400	1000
Minimum volume (L)	50	100	200
Aspect ratio total volume (L)	2.3	2.1	2.1
Aspect ratio working volume (L)	1.6	1.5	1.5
Autoclave dimensions with condenser (WxH mm)	180 x 240 mm	210 x 280 mm	180 x 380 mm
Drive system	Direct drive, lipsealed		
Impellers	Choice of Rushton and Marine		
Gas sparger	Porous sparger, open pipe sparger or jet sparger		
Gas overlay	Yes		
Exhaust gas	Electrically cooled exhaust gas condenser (evaporation <4% per day at 37°C @ 2vvm)		
Sampling	Fixed sample pipe with optional sampling system		
Draining	Height adjustable drain pipe		
Additions	4 fixed inlet ports and optional micro liquid injectors		
pH	Measurement: 8 mm classic pH sensor Control: via acid pump (variable speed pump) or CO_2 gas in combination with alkali pump (variable speed pump)		
DO_2	Measurement: LumiSens Optical DO_2 sensor Control: via a combination of N_2, Air, O_2 (needle valve standard		
Temperature	Measurement: Pt-100 sensor in thermowell in topplate Control: electrical cooling and heating jacket via bioreactor wall		
Foam	Measurement: Height adjustable conductivity based foam sensor Control: anti-foam addition (variable speed pump)		
Level	Control: variable speed pump for liquid addition or removal		
Optional inlets	Septum, chemostat tube, liquid entry system		

Specifications (Part 2/3):

	2 L		3 L		5 L	
	single wall	jacketed	single wall	jacketed	single wall	jacketed
Total volume (L)	2.2	2.2	3.1	3.1	4.8	4.8
Working volume (L)	1.7	1.7	2.4	2.4	3.4	3.4
Minimum volume (L)	0.3	0.3	0.6	0.6	0.9	0.9
Aspect ratio total volume (L)	2.3	2.3	1.9	1.9	1.6	1.6
Aspect ratio working volume (L)	1.9	1.9	1.5	1.5	1.1	1.1
Autoclave dimensions with condenser (WxH mm)	200 x 460 mm	240 x 500 mm	200 x 460 mm	240 x 460 mm	200 x 520 mm	260 x 570 mm
Drive system	Direct drive, lipsealed or magnetically coupled					
Impellers	Rushton and marine with outside diameters 45 mm, 60 mm 75 mm or 85 mm					
Gas sparger	Porous sparger or L-type sparger					
Gas overlay	Yes					
Exhaust gas	Water cooled exhaust gas condenser					
Sampling	Fixed height or height adjustable sample pipe with optional sampling system Sample pipe internal diameters choices are: 1.7 mm, 4 mm, 6 mm or 10 mm					
Draining	Drain pipe					
Additions	Triple or single inlet ports and optional micro liquid injectors					
pH	Measurement: 12 mm classic pH sensor Control: via acid pump or CO_2 gas (rotameter or MFC) in combination with alkali pump					
DO_2	Measurement: 12 mm classic polarographic DO_2 sensor or LumiSens for 2-5 L Control: via a combination of N2, Air, O2 (Rotameter or MFC) and agitation					
Temperature	Measurement: Pt-100 sensor in thermowell in topplate Control: cooling and/or heating jacket via bioreactor wall or via internal heat exchanger					
Foam	Measurement: Height adjustable conductivity based foam sensor Control: anti-foam addition pump					
Level	Measurement: Height adjustable conductivity based level sensor Control: pump for liquid addition or removal					
Optional inlets	Septum, chemostat tube, liquid entry system					

Specifications (Part 3/3):

	7 L		15 L		20 L
	single wall	jacketed	single wall	jacketed	single wall
Total volume (L)	6.8	6.8	16.5	16.5	23
Working volume (L)	5.4	5.4	12	12	16
Minimum volume (L)	1.5	1.5	3.0	3.0	3.0
Aspect ratio total volume (L)	2.5	2.5	1.7	1.7	2.4
Aspect ratio working volume (L)	1.8	1.8	1.5	1.5	2.0
Autoclave dimensions with condenser (WxH mm)	260 x 630 mm	360 x 670 mm	340 x 815 mm	480 x 835 mm	340 x 990 mm
Drive system	Direct drive, lipsealed or magnetically coupled				
Impellers	Rushton and marine with outside diameters 45 mm, 60 mm 75 mm or 85 mm				
Gas sparger	Porous sparger or L-type sparger				
Gas overlay	Yes				
Exhaust gas	Water cooled exhaust gas condenser				
Sampling	Fixed height or height adjustable sample pipe with optional sampling system Sample pipe internal diameters choices are: 1.7 mm, 4 mm, 6 mm or 10 mm				
Draining	Drain pipe				
Additions	Triple or single inlet ports and optional micro liquid injectors				
pH	Measurement: 12 mm classic pH sensor Control: via acid pump or CO_2 gas (rotameter or MFC) in combination with alkali pump				
DO_2	Measurement: 12 mm classic polarographic DO_2 sensor or LumiSens for 2-5 L Control: via a combination of N2, Air, O2 (Rotameter or MFC) and agitation				
Temperature	Measurement: Pt-100 sensor in thermowell in topplate Control: cooling and/or heating jacket via bioreactor wall or via internal heat exchanger				
Foam	Measurement: Height adjustable conductivity based foam sensor Control: anti-foam addition pump				
Level	Measurement: Height adjustable conductivity based level sensor Control: pump for liquid addition or removal				
Optional inlets	Septum, chemostat tube, liquid entry system				

Bioreactor Preparation Solution

– Multi-Use Bioreactor Washing and Sterilization

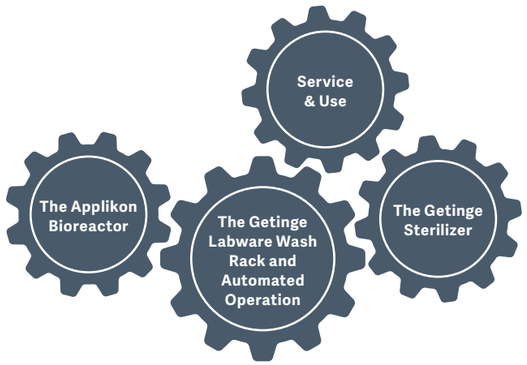
The reproducibility of your work relies on a properly cleaned and sterilized bioreactor. Getinge's holistic approach to cleaning and sterilization of multi-use bioreactors ensures efficacy and repeatability.

Step 1: Automated washing using the purpose-built bioreactor wash rack sets the foundation for a highly reproducible system.

Step 2: Getinge's integrated sterilization process allows three different types of loads in one cycle with ensured steam penetration into all components for improved quality assurance.

Together, the Getinge complete solution confirms accurate, repeatable results in less time with less labor so you can get back to what matters – your work.

Working together:



Holistic Multi-Use Bioreactor Cleaning and Sterilization

From biopharmaceutical research to production – Getinge makes bioreactor selection, decontamination, and sterilization easy.

Applikon Bioreactor Systems

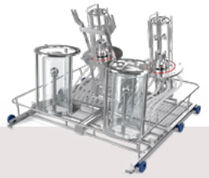
The Applikon multi-use bioreactor is used in academic, government and biopharmaceutical laboratories for benchtop research.

- Glass autoclavable bioreactors and fermenters are available in 2, 3, 5, 7, 15, and 20L total volume.

Getinge Lancer Ultima Laboratory Washers

The Getinge Lancer Ultima series includes undercounter and freestanding models that offer a wide range of labware loading options depending on the research being made.

- Glass autoclavable bioreactors and fermenters are available in 2, 3, 5, 7, 15, and 20L total volume.



Getinge Laboratory Sterilizers

Getinge GSS L/-R and Getinge Lancer LSS Sterilizers offer the simplest solution to assured sterilization for reproducibility and quality assurance.

- Accommodates three different types of loads, hard goods, tubing and liquid, in one cycle while removing all ambient air using a single pre-vacuum and multi-pulsed steam pressure.
- Getinge Laboratory Sterilizers includes models in sizes ranging from 130L to 1000L (4.6 cu.ft. to 35.3 cu.ft.).

Getinge Bioreactor Wash Rack

When Getinge washers include the Getinge specialty wash rack, the Applikon multi-use bioreactor can be partially or fully disassembled before washing.

- The design features an injector system to clean ports on the bioreactor headplate.
- Pre-validated cleaning performance ensures accurate and repeatable results.

Read our bioreactor washing white paper[1] or view our application brief on bioreactor sterilization best practices [2]
For more information on the bioreactor preparation solution.
For product information, visit getinge.com.

[1] Getinge White Paper: LS3255- Bioreactor Preparation Solutions - specialty wash rack assures validated cleaning in advance of sterilization.

[2] Getinge Application Brief: LS 3260 -Best Practices for Multi-use Bioreactor Sterilization

AppliFlex ST

– Single-use Bioreactors for Lab-scale

The AppliFlex ST is a fully customizable stirred tank single-use bioreactor. By using 3D printing technology, we can create any head plate configuration and the optimal headplate design for your process. With this single-use system there is no risk of cross contamination between runs.
The pre-sterilized, ready-to-use bioreactor makes your life in the lab easier. No more assembly and sterilization before you can start your culture. No more cleaning after the culture is finished. Save time and costs, execute more runs, and reduce your time-to-market.

Benefits:

- Fully customizable to meet your bioprocessing needs
- No more cleaning, preparing and sterilizing bioreactors
- Perform more experiments in a shorter time
- Eliminate the risk of cross-contamination between runs
- Improve reproducibility and outcomes of your experiments

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Features:

- Integrates with software automation and automated sampling tools
- Interchangeable with multi-use systems
- Removable topplate
- Shelf life 2 years
- Pre-sterilized and ready-to-go
- Fully closed bioreactor system
- Single-use sensor option available

Custom Design:

The AppliFlex ST differentiates from other single-use bioreactors by being a fully customizable stirred tank bioreactor. You can choose, or even design, the type and number of impellers, the number of liquid and gas additions and the type of sparger that are optimal for your process. No more unused ports or spargers with blind plugs, but an optimized bioreactor for your specific process development and R&D application.

The 3D printing production technology guarantees complete reproducibility between each bioreactor produced guaranteeing exact and identical conditions between runs. The AppliFlex ST offers the flexibility that you need for your specific bioprocess and is available for both cell culture and microbial applications.

The AppliFlex ST can be used as a single unit as well as a parallel processing system. The 500 mL AppliFlex ST is the scale down version of the 3 L bioreactor guaranteeing an easy scale-up of your process from 500 mL to larger volume cultivations. The 3 L and 15 L AppliFlex ST are designed to directly replace their autoclavable counterparts.
The single-use system can be exchanged with a multi-use system whenever your process or workflow needs a different approach.

The AppliFlex ST 500 mL and 3 L feature a fully removable topplate for operators to have easy access to the culture. Pouring into downstream processing vessels or other bioreactors has never been this easy. Optionally a closed lid is available which makes the vessel ready for transport, storage or freezing.
A water supply is not required to operate the AppliFlex ST, cooling and heating are done using electric elements and the condenser is cooled electrically as well. This is only available on the 500 mL for now. No expensive laminar flowhood is needed to operate the system, except for operator handling.

The AppliFlex ST can easily be integrated into a DeltaV™ control installation using our V-Control software. This makes process transfer from the lab to production and from production to the lab very simple.

Related products:

- Livit Flex
- my-Control
- pH sensor
- DO_2 sensor/ LumiSens Optical DO_2 sensor
- V-Control software
- Lucullus® software
- Autosamplers

Specifications (Part 1/2):

Physical characteristics	500 mL	3 L	15 L
Dimensions (h x Ø)	236 x 75 mm	340 x 130 mm	500 x 223 mm
Weight	0.2 kg (1 bioreactor)	0.7 kg (1 bioreactor)	1,7 kg (1 bioreactor)
Bottom	Dished bottom	Dished bottom	Dished bottom
Total volume	575 mL	3 L	15 L
Working volume	100 – 400 mL	0.65 – 2.4 L	3 - 12 L
H/D ratio total volume	2.0	2.0	2.0
H/D ratio working volume	1.33	1.33	1.33
Impeller type	Marine / Rushton / Anchor / None / Hydrofoil / Helical and more...		Marine
Impeller diameter	Customizable	52 mm	74 / 88,8 mm - to be determined after testing
Sparger type	Pipe with Ø2mm hole / Open pipe / Sparger stone / Jet sparger / Porous sparger and more...		Porous sparger

Specifications (Part 2/2):

Operating conditions	500 mL	3 L	15 L
Working temperature	5 – 45 °C	5 – 45 °C	5 – 45 °C
Storage temperature	-80 – 45 °C	-80 – 45 °C	-80 – 45 °C
Design pressure	0 – 0.5 barg	0 – 0.1 barg	0 – 0.1 barg
Mixing time	~3 seconds	~3 seconds	~3 seconds

Connections	500 mL	3 L	15 L
Sterilization	>25 kGy Gamma irradiation		

Sensors options	500 mL	3 L	15 L
Measurement range	Single-use sensors or traditional multi-use sensors		

AppliFlex ST GMP

– Single-use Bioreactors for Clinical Applications

The AppliFlex ST GMP* is a customizable single-use bioreactor that is designed to meet all cGMP requirements for clinical CGT applications. It enables a seamless process transition from R&D to clinical production.
The AppliFlex ST GMP is available in 500 mL and 3 L and can be customized to your requirements.

Benefits:

- Seamless process transition from research to clinical production (both scale up and scale out)
- Designed to meet the requirements for clinical production, such as material requirements, traceability, particle requirements and much more
- Builds on the proven customization ability of the AppliFlex ST for research and development purposes

Applications:

- Cell therapy products
- Gene therapy products
- Viral vector components
- mRNA synthesis
- Biopharmaceutical cell culture

Features:

- Fully closed bioreactor system
- Pre-sterilized and ready-to-go
- Following the strictest cGMP standards
- Available as turnkey package
- Full customizable design

Specifications:

Physical characteristics	500 mL	3 L
Dimensions (h x Ø)	236 x 75 mm	340 x 130 mm
Weight	0.2 kg (1 bioreactor)	0.7 kg (1 bioreactor)
Bottom	Dished bottom	Dished bottom
Total volume	575 mL	3 L
Working volume	100 – 400 mL	0.65 – 2.4 L
H/D ratio total volume	2.0	2.0
H/D ratio working volume	1.33	1.33
Impeller type	Marine / Rushton / Anchor / None / Hydrofoil / Helical and more...	
Impeller diameter	Customizable	52 mm
Sparger type	Pipe with Ø2mm hole / Open pipe / Sparger stone / Jet sparger / Porous sparger and more...	

Operating conditions	500 mL	3 L
Working temperature	5 – 45 °C	5 – 45 °C
Storage temperature	-80 – 45 °C	-80 – 45 °C
Design pressure	0 – 0.5 barg	0 – 0.1 barg
Mixing time	~3 seconds	~3 seconds

Connections	500 mL	3 L
Sterilization	>25 kGy Gamma irradiation	

Sensors options	500 mL	3 L
Measurement range	Single-use sensors or traditional multi-use sensors	

Related products:

- Livit Flex
- my-Control
- pH sensor
- DO_2 sensor/ LumiSens Optical DO_2 sensor
- V-Control software
- Lucullus® software
- Autosamplers

*** Disclaimer**
Purpose/intended use: Getinge's GMP compliant systems are intended to be used in GMP compliant production and research environments. The system is not intended to be used as a medical device.

BioBench and BioPilot

– Multi-use Bioreactors for Pilot and Production-scale

Getinge's concept of modularity (using standard modules to customize the functions of the bioreactor) is extended to the stainless steel pilot plant bioreactors as well. For scale up purposes the range of the BioBench and BioPilot systems, designed and built to the latest standards on hygienic processing and cGMP and GAMP validation requirements, complements the laboratory scale bioreactor systems. Scale-up from laboratory scale to pilot plant and small scale production is simplified by the consistent bioreactor design and the scalable control solutions. All systems are designed to be cleaned-in-place. Getinge offers fully automated CIP systems compatible with our bioreactor systems. Standardized bioreactor systems are available up to 270 liter total volume and custom built units can be supplied up to 5,000 liter total volume. Designed according to ASME BPE guidelines.

Applications:

- Scale-up studies
- Medium optimization
- Process optimization
- Small scale production
- Microbial and Cell culture
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Features:

- Easy to clean mirror polished external finish
- Electropolished finish of all parts in contact with the culture (Ra < 0.4 µm) to allow efficient Clean-in-place
- Modular design allows easy adaptation to changing process demands
- Magnetically coupled agitator for peace of mind
- cGMP compliant design simplifies validation
- Compact design reduces floor space needed
- Open frame construction gives easy access for maintenance and operation

Specifications:

	Total volume (liter)	Working volume (liter)	Minimum working volume (liter)	Aspect ratio total volume	Aspect ratio working volume
20 liter BioBench	20	15	4	3.0	2.2
30 liter BioBench	30	22.5	7	2.0	1.6
30 liter BioPilot Cell	30	20	7.5	1.5	1.0
60 liter BioPilot Cell	60	40	10	1.5	1.0
130 liter BioPilot Cell	130	100	28	1.5	1.0
20 liter BioPilot Microbial	20	15	4	3.0	2.2
40 liter BioPilot Microbial	40	30	7.5	3.0	2.2
70 liter BioPilot Microbial	70	50	10	3.0	2.2
140 liter BioPilot Microbial	140	100	20	3.0	2.2
270 liter BioPilot Microbial	270	200	50	3.0	2.2

Custom build bioreactor systems are available up to 5,000 liter total volume

Drive system	Magnetically coupled, optional mechanical seal, bottom or top mounted agitator for microbial cultures and top mounted for cell culture systems
Maximum agitator tipspeed (m/s)	5 m/s for microbial cultures and 1 m/s for cell cultures
Impellers	Rushton and marine with outside diameters 0.33 - 0.5 vessel diameter
Gas sparger	Porous sparger, L-Sparger or Ring-type sparger
Gas overlay	Optional gas overlay line
Exhaust gas	Water cooled exhaust gas condenser with internal spiral and/or jacketed
Sampling	Optional re-sterilizable sample system in DN25 port in lower side wall
Draining	Re-sterilizable bottom mounted bellows drain
Additions	Sterilizable additions (push valves) and re-sterilizable addition ports
pH	Measurement: 12 mm classic pH sensor in DN25 port in lower side wall Control: via acid pump or CO_2 gas (rotameter or MFC) in combination with alkali pump
DO_2	Measurement: 12 mm polarographic DO_2 sensor in DN25 port in lower side wall Control: via a combination of N2, Air, O_2 (Rotameter or MFC) and agitation
Temperature	Measurement: Pt-100 sensor in DN25 port in lower side wall Cultivation control: cooling and heating jacket via bioreactor wall
Foam	Measurement: Height adjustable conductivity based foam sensor Control: anti-foam addition pump
Level	Measurement: Height adjustable conductivity based level sensor or loadcells in bioreactor frame Control: pump for liquid addition or removal

SUPR

– Single-use Bioreactors for Pilot and Production-scale

The intuitive Single-Use Production Reactor system, built on proven Applikon design, helps you simplify your bioprocesses and speed up development. The SUPR cultivation container arrives sterilized, assembled, and ready to use. The innovative click-and-go bag loading system of the SUPR holder together with the intuitive tube management system enables easy installation. Getting started is as simple as that.

Benefits:

- No risk of cross-contamination between products
- Click-and-go bag loading for easy use
- All-in-one single-use cultivation container for fast start-up and changeover
- Save time on cleaning and validation procedures
- Low risk of operator exposure

Applications:

- Cell and gene therapies
- mABs
- Vaccines
- Diagnostics

Features:

- Available in 50 L and 250 L cultivation containers (1.000 L upcoming)
- Four core components: SUPR cell cultivation container, SUPR holder, TCU and controller
- Fully qualified for biological product contact per USP Class VI plastics
- Manufactured and documented under cGMP conditions

SUPR design

The SUPR is part of our comprehensive bioprocessing portfolio that takes you all the way from research to production. With a dished bottom, top centered impeller, and specific height-to-diameter ratio, the SUPR is built using an established Applikon design that is based on over five decades of bioprocessing experience.

The SUPR system is designed to be a single-use alternative to traditional stainless steel bioreactors at pilot and production scale. This allows for cultivations to continue from research to production with one trusted single-use platform. R&D and process optimization performed in the AppliFlex ST can easily be scaled up using the SUPR.

Specifications:

	50 L	250 L
Total volume (L)	71	356
Working volume (L)	50	250
Minimum volume (L)	10	50
Aspect ratio total volume (L)	1.7	1.7
Aspect ratio working volume (L)	1.24	1.23
Maximum agitator tipspeed (m/s)	1 m/s	1 m/s
Bottom	Dished bottom	Dished bottom
Impellers	Marine with 152 mm diameter	Marine with 260 mm diameter
Sparger	Drilled hole sparger	Drilled hole sparger
Ports	• 1 X Sample port + Temperature pocket • 1 X single-use Optical DO sensor InSUS 607 Mettler Toledo • 1 X single-use pH sensor InSUS 310 Mettler Toledo	• 1 X Sample port + Temperature pocket • 1 X single-use Optical DO sensor InSUS 607 Mettler Toledo • 1 X single-use pH sensor InSUS 310 Mettler Toledo
Special port	• 1x Drain to Bottom port with CPC MPX 1/2" connector	• 1x Drain to Bottom port with CPC MPX 3/4" connector
Sterilization	>25 kGy Gamma irradiation	>25 kGy Gamma irradiation

Related products:

- Livit Flex
- Pro-Control
- pH sensor
- DO2 sensor
- V-Control software, Siemens PLC, Allen Bradley PLC, iFix

Motor Controller

– Powerful Stirring

The Motor Controller is a robust and user-friendly device that allows for easy and stable mixing.
The Motor Controller can be supplied with 4 different types of brushless stirrer motors that can support mixing in vessels up to 130 L. The Motor Controller can be used in bioprocessing applications as a more powerful external motor controller for biocontrollers, such as the in-Control, or as a stand-alone controller that can be used for applications such as mixing of medium tanks. These can be mixing of medium tanks in bioprocessing applications or general mixing purposes in any industry. Furthermore, the Motor Controller can be used as replacement of the ADI 1032 motor controllers. The Motor Controller can be controlled remotely, which allows for easy integration in existing systems and also allows for data logging into external software platforms. Intuitive software has been developed that makes it very easy for the operators to work with the controller and includes trending and alarming possibilities.

Benefits:

- Powerful stand-alone motor controller for laboratory applications
- Support of maintenance-free brushless motors reduces costs
- Easy operation due to very intuitive user interface

Applications:

- Stirrer motor controller in bioprocessing application
- Mixing device for general mixing purposes

Features:

- Intuitive 7" color touchscreen user interface
- Integration with biocontrollers and/or SCADA software through external control possibility
- Integrated trending and alarming possibilities
- Support of 4 different types of brushless stirrer motor for control up to 130 L vessels

Specifications:

Stirring	
Measurement and control range	M10: 0 - 2000 rpm M14: 0 - 750 rpm M20: 0 - 2000 rpm M33: 0 - 1000 rpm
Measurement and control accuracy	0.1 % of full scale
Feedback	Encoder
Motor type	DC, permanent magnet
Safety features	External E-stop
External control	Via analog signal SCADA (Lucullus®) through ethernet connection

Control	
Control hardware platform	Getinge proprietary
Control software platform	Getinge firmware
Certifications	CE certified, GAMP compliant
Connectivity	Compatible with Livit Flex, SUB-Control, ez-Control, ez2-Control, my-Control, in-Control and i-Control

Related products:

Brushless stirrer motors

- M10 for 2 – 7 L bioreactor
- M20 for 5 – 7 L bioreactor
- M14 for 15 – 130 L bioreactor (cell culture)
- M33 for 15 – 30 L bioreactor (microbial)

Biocontrollers

- in-Control
- ADI 1010

my-Control

– Small but powerful

The my-Control is our most advanced bioreactor controller for small scale bioreactors starting at 50 mL (working volume). The system can control bioreactors up to a total volume of 3 L. This versatile controller can be used for both cell culture and microbial cultures. With its footprint of only 19 by 35 cm (W x D) it uses the minimal amount of bench space, allowing as many as 5 on 1 m width of bench space. The built-in web server allows the my-Control to be operated by any computer with a web browser. Wireless devices like iPad, iPhone or Android tablets or phones can also be used to operate the my-Control. The selectable colored band on the unit allows the system to be personalized to fit your laboratory.

Benefits:

- Enhanced parallel processing by allowing up to 32 my-Controllers in one human interface
- Enhanced parallel processing using multi-reactor interface for batch operations on up to 8 myContols
- Easy operation through web browsers

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Features:

- Control of all bioprocess parameters, including pH, temperature, dissolved oxygen, agitation, foam and level
- Selectable autotuning adaptive PID control for accurate control when process conditions change during the culture
- Extended liquid additions options tuned to small scale cultivation via up to 4 variable speed pumps at the front of the controller
- Enhanced gas addition strategies via 4 mass flow controllers
- No water connections needed due to electrical cooling and heating system for bioreactor and condenser (not available on all size reactors)
- USB connections for third party sensors, single use pH/DO sensors and balances
- Redox measurements

Specifications:

Sensors	
pH Sensor	Traditional electrochemical or Single-use
DO sensor	Traditional Polarographic, Optical LumiSens or Single-use
Redox	Traditional electrochemical
Temperature	Pt-100, measurement Range: 0-150 °C accuracy 0,1°C
Foam/level	Resistive based measurement
Weight	Input for external balances
Optional	Biomass (Capacitance or optical density) or Offgas measurements
Additional I/O	Up to 4 Analog in and 4 Analog out, up to 8 Digital out

Actuators	
Gas	Up to 4 MFC's or needle valves with solenoid valves, max. flow 1.500 mL/min N2 equialent
Liquids	4 variable speed pumps, up to 40 mL/min 2 microvalves or up to 4 external variable speed pumps
Stirring	0-2000 rpm
Temperature	Peltier elements or heating blanket or cooling with cold water water valve (full Peltier only on the 500 mL)

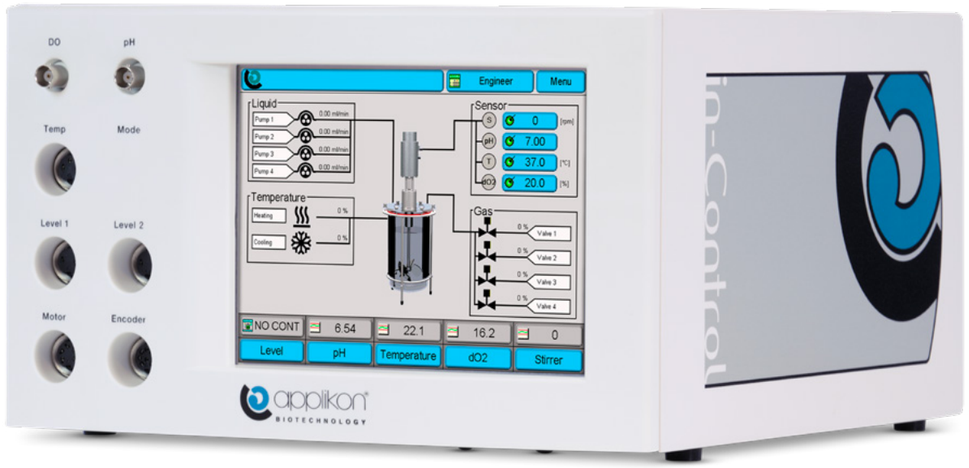
Control	
Hardware and Software platform	Up to 4 MFC's or needle valves with solenoid valves, max. flow 1.500 mL/min N2 equialent
Certifications	CE certified, GAMP compliant
21 CFR part 11 compatible	Yes
Communication & SCADA	Lucullus® PIMS, BioXpert W10, DeltaV™ OPC server available

Related products:

- Autoclavable bioreactors
- Single-use bioreactors
- Sensors
- Lucullus® software
- V-Control software

in-Control

– Simply Powerful



The in-Control is a process controller for laboratory scale bioreactors offering high level control on a small footprint. The controller can be used for both cell cultures and microbial cultures. The system is designed to replace the ADI 1010 and ADI 1030 BioControllers. The human interface is a built-in color touch screen. This modular system allows you to create the most optimal set-up as you can add any extra inputs or outputs. You are in control.

Benefits:

- Increased flexibility by optional extra inputs and outputs
- Easy operation through touch screen interface and through web browsers
- Enhanced gas addition strategies via up to 4 Mass Flow Controllers
- Reduce footprint by small size controller
- Replacement of ADI biocontrollers

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Specifications:

Sensors	
pH Sensor	Traditional electrochemical or Single-use
DO sensor	Traditional Polarographic, LumiSens or Single-use
Redox	Traditional electrochemical
Temperature	Pt-100, measurement Range: 0-150 °C accuracy 0,1°C
Foam/level	Resistive based measurement
Weight	Input for external balances
Optional	Biomass (Capacitance or optical density) or Offgas measurements
Additional I/O	Up to 4 Analog in and 4 Analog out, up to 8 Digital out
Actuators (optional)	
Gas	External gas box, options for 4 MFC's or 4 Rotameters
Liquids	Using powerbox up to 8 digital outs for switchable pumps, up to 4 external variable speed pumps
Stirring	0-2000 rpm
Temperature	Heating blanket or cooling with cold water valve
Control	
Control Hardware and Software platform	Getinge proprietary and Getinge Firmware
Certifications	CE certified, GAMP compliant
21 CFR part 11 compatible	Yes
Communication & SCADA	Lucullus® PIMS, BioXpert W10, DeltaV™ Getinge OPC server available

Features:

- Control of all bioprocess parameters, including pH, temperature, dissolved oxygen, agitation, foam and level
- Selectable autotuning adaptive PID control for accurate control when process conditions change during the culture
- USB connection for optional biomass or fluorophor pH and DO sensors and balances
- Ethernet communication to SCADA
- Same familiar Getinge control platform as the ez-Control, ez2-Control, in-Control, SUB-One controller

Related products:

- Autoclavable bioreactors
- Single-use bioreactors
- AppliSens sensors
- Lucullus® software
- V-Control software

Livit Flex

– The next generation in bioprocess control

Livit Flex brings nearly half a century of Applikon expertise together with the latest technologies to deliver an intuitive and easily configurable bioprocess controller that fits any R&D application.

Livit Flex can be configured as a single or dual control system for single-use or multi-use bioreactors to optimize bench space in the laboratory. The Livit Links enable plug-and-play connection of sensors and auxiliaries with the controller automatically recognizing new devices.

Both experienced and new users will be up and running in no time thanks to the new, intuitive Livit software platform with built-in data acquisition. Livit software is fully configurable and easy to use. Every sensor or actuator has its own widget so users can easily access and modify all settings, and even connect multiple Livit Flex controllers in a network.

By accessing and controlling multiple controllers from one PC in a lab, users can easily set-up parallel experiments and monitor all experiments from one central location.

Combining the flexibility of the Livit Flex controller, the intuitive Livit software, and Getinge bioreactors enables you to accelerate your R&D processes and bring your pharmaceutical and biotech products to market faster.

Benefits:

- Optimized system configuration and investment that match your dedicated needs
- Faster development thanks to system flexibility and advanced software functionalities
- Reduced risk of operator error and training time through intuitive and user-friendly interface

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Related products:

- Autoclavable bioreactors
- Single-use bioreactors
- AppliSens sensors
- Lucullus® software
- V-Control software

Features:

- Single or dual bioprocess control system
- Up to 8 variable speed pumps
- Up to 12 mass flow controllers or up to 8 mass flow meters
- Electronic gas selection block
- Plug-and-play sensor and actuators through Livit Links
- Built-in data acquisition, alarm and user management
- OPC-UA compliant
- Compatible with V-Control and Lucullus software
- Compatible with Applikon multi-use and AppliFlex ST single-use bioreactors

Specifications:

Sensors	
pH Sensor	Traditional electrochemical or Single-use
DO sensor	Traditional Polarographic, LumiSens or Single-use
Redox	Traditional electrochemical
Temperature	Pt-100, measurement Range: 0-150 °C accuracy 0,1°C
Foam/level	Resistive based measurement
Weight	Input for external balances through flexible Livit Links
Optional	Wide variety of 3rd party sensor technology supported through flexible Livit Links such as biomass, pCO2, etc.
Additional I/O	Up to max. 48 analog inputs and outputs through flexible Livit Links (max. amount depending of system configuration)

Actuators (optional)	
Gas	Up to 12 MFC's up to 1.5 L/min or up to 8 MFC's or MFM's for flows up to 40 L/min with accuracy up to 0.5% RD + 0.1% FS. Option for electronic gas selection block
Liquids	Up to 8 internal variable speed pumps, option for multiple external pumps through Livit Links
Stirring	0-2000 rpm
Temperature	Heating blanket, cooling with cold water valve and thermocirculator option available

Control	
Control Hardware and Software platform	Getinge proprietary and Getinge Firmware
Certifications	CE certified, GAMP compliant
21 CFR part 11 compatible	Yes, if combined with Lucullus GMP or V-Control
Communication & SCADA	Lucullus® PIMS, V-Control (DeltaV™) Getinge OPC-UA server available

i-Control

– The Scalable Control System

i-Control is an easy to operate bioreactor control system and utility console. This scalable control solution is used to control processes in bioreactor systems from laboratory scale to pilot plant and production scale saving time and money during scale-up. The i-Control is available in a single, a dual bioreactor set-up as well as in a Quad (4 bioreactors) configuration. This standard control solution can be supplied with Allen Bradley, Siemens PLC's or DeltaV™. Basic functionality includes advanced process control for numerous parameters, fully automatic sterilization and Clean-in-place routines. The off-the shelf system is supplied pre-configured and ready to use.

Benefits:

- Off-the-shelf standard solution
- Robust industrial solution

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation
- Pilot processes

Features:

- Reliable control platform (Allen Bradley, Siemens or DeltaV™ hard- and software)
- Supplier independent solution based on industry standard hardware
- Local Control and local display
- Integrates with any factory automation system
- Fully documented supply eases validation
- Can be used in a 21CFR part 11 compliant system

Specifications:

Sensors	
pH Sensor	Traditional electrochemical * *Single-use sensor options, redundant options available
DO sensor	Traditional Polarographic *Single-use sensor options, redundant options available
Redox	Optional
Temperature	Pt-100, measurement Range: 0-150 °C accuracy 0,1°C
Foam/level	Resistive based measurement
Weight	Balances and/or Load cells
Optional	Biomass (Capacitance or optical density), offgas measurements, pressure
Additional I/O	Configurable
Actuators (optional)	
Gas	Up to 8 MFC's with solenoid valves or up to 8 rotameters with solenoid valves
Liquids	Up to 4 internal variable speed pumps / 2+ external variable speed pumps
Stirring	0-2000 rpm
Temperature	Heating blanket or external Temperature Control Unit (TCU)
TCU options	Thermoflex Neslab, Lauda, GWK, Polyscience
Control	
Control Hardware and Software platform	Siemens or Allen Bradley / Siemens, Allen Bradley, iFix, DeltaV™
Certifications	CE certified, GAMP compliant
21 CFR part 11 compatible	Yes
Communication & SCADA	Lucullus® PIMS, DeltaV™

Related products:

- Autoclavable bioreactors
- Single-use bioreactors
- Sensors
- Lucullus® software
- V-Control software
- iFix software

Pro-Control

– Bioprocess control in Pilot & Production

The Pro-Control is a controller designed to work with pilot and production scale bioprocessing systems. It can be integrated with the single-use production bioreactor (SUPR) in the range of 50 to 250 L maximum working volume, or with our stainless steel vessel with a range of 240 L (BioPilot) to 5,000 L (BioProduction) maximum working volume. The Pro-Control is equipped with the latest standard in pump, MFC and sensor technology.

The Pro-Control comes in two designs. One design is on wheels that provides optimal flexibility while working with the SUPR and the other design is placed on a skid next to a stainless steel bioreactor.

Benefits:

- Fully configurable controller based on your requirements
- Turn-key package with the SUPR and the BioPilot
- Variety of software platforms available for maximum connectivity

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Features:

- Options in control platform
- Siemens PLC
- Allen Bradley PLC
- V-Control (DeltaV™)
- iFix
- Local control and local display
- Integrates with any factory automation system
- Fully documented supply eases validation
- Can be used in a 21CFR part 11 compliant system

Specifications:

Sensors	SUPR	BioPilot / BioProduction
	Single-use bioreactors	Stainless steel bioreactors
pH Sensor	Mettler Toledo INSUS pH sensor	Traditional Electrochemical
DO sensor	Mettler Toledo INSUS DO sensor	Traditional Polarographic
Redox	No	Optional
Temperature	Pt-100, Measurement Range: 0-150 °C accuracy 0,1°C	
Foam/level	No	Resistive based measurement
Weight	Reactor load cells and balances	Reactor load cells and balances
Optional	Biomass (Capacitance or optical density), offgas measurements, pressure	
Additional I/O	Up to 8 Analog in and 4 Analog out	Configurable Up to 8 Digital In and 8 Digital out
Actuators (optional)		
Gas	Up to 8 MFC's with solenoid valves or up to 8 rotameters with solenoid valves	
Liquids	Up to 4 internal fixed speed pumps Up to 2 external variable speed pumps	
Impeller	Marine Impeller	Rushton, marine, hydrofoil and more
Temperature	Lauda Temperature Control Unit (TCU)	Cooling and heating jacket via bioreactor wall via tap water, chilled water, indirect steam or direct steam injection
Control		
Control Hardware and Software platform	Siemens or Allen Bradley Siemens, Allen Bradley, iFix, DeltaV™	Siemens or Allen Bradley Siemens, Allen Bradley, iFix, DeltaV™
Certifications	CE certified, GAMP compliant	CE certified, GAMP compliant
21 CFR part 11 compatible	Yes	Yes
Communication & SCADA	Lucullus® PIMS, DeltaV™, iFix Getinge OPC server available	Lucullus® PIMS, DeltaV™, iFix Getinge OPC server available

Related products:

- Single-use bioreactors
- Multi-use stainless steel bioreactors
- Sensors
- V-Control software
- Siemens, Allen Bradley or iFix software

Lucullus® PIMS

– From Idea to Report

Lucullus® Process Information Management System (PIMS) offers a new dimension in upstream bioprocess data management. As a Network SCADA solution, Lucullus® can additionally control a heterogeneous collection of devices and bioreactors from different vendors. Furthermore, Lucullus® integrates functionalities and activities around creation and planning of recipes, reactor allocation, Design of Experiments (DOE), media preparation, media component traceability, data analysis, data mining, automatic reporting and modelling.

Benefits:

- Integration of functions in a single software solution that saves time
- All data is stored in a central Oracle® database
- Ability to monitor and control several bioreactors of different brands and types
- Applicable to a wide range of different cultivation volumes

1. Idea & Recipe

Make your process idea come true with an intuitive tool to create your process recipe

- Create your instruction sequences for simple or advanced processes and use them within multiple processes
- Integrate sequential calculations in your instructions based on time and events
- Receive Notifications, Emails, or SMS alarms in case your process deviates from your predefined limits

2. Planning

Define everything in advance with an intuitive workflow to start processes with minimal effort

- Make optimal use of your shared resources using integrated scheduling tools
- Maximize your experiment efficiency by integrating third party DOE modules into your planning process
- Manage samples efficiently with overall strategies to coordinate sampling, sample tube preparation and barcoding
- Retrieve data automatically from at-line analyzers (E.g. Vicell, Nova pHOx, Nova Flex etc.)

3. Preparation

Manage your Media center components and storage uniformly and efficiently

- Automate culture media creation
- Keep track of the availability of culture media in your storage
- Optimize the availability of raw materials in your storage
- Get more insight by keeping track of raw media components used in your culture runs

Lucullus® PIMS can be supplied in three different architectures

1 | Stand-alone installation

The stand-alone installation is used for up to 8 different bioreactors or one multi-bioreactor system on one computer. Data is stored in a local Oracle® database and access to the process data can occur via the local computer or via a remote network link to this process computer. Interactions to the process can occur via the local computer in the laboratory.

2 | Client server installation

The Client-Server installation is used for bigger Lucullus® multi-bioreactor systems, in different labs, all connected to the same software. This distributed architecture allows the data to be stored in a safe location while the front end user interfaces are located near the bioreactors. At the office, data can be reviewed via a direct link to the data server on the network. Data from different laboratories can be compared and can be used for process control, as well as, for reporting and making decisions for further process development.

3 | Enterprise installation

For even larger Lucullus® installations at different sites (and even in different countries). This version connects different installations of Lucullus® and allows on the fly conversion and translation of process data. The authorized user can view and compare data between different sites (for example, between a production site and a process development site, or development sites in different locations working on the same process).

4. Execution

Execute recipes and monitor experiments

- Execute a process based on a predefined recipe or planning
- Start several bioreactors in parallel and monitor them simultaneously
- Store process data in a safe and industry standard Oracle® database
- Make well informed decisions by comparing multiple processes simultaneously
- Evaluate running processes via 3D graphs and tables

5. Evaluation

Turn data into useful information using a wide range of evaluation components

- Visualize process results by creating advanced graphs and tables
- Deepen your insight by using overlay graphs for a set of processes
- Turn data into useful information using advanced data analysis tools
- Automatically verify your process model against your experimental data
- Save time and achieve consistency by generating reports automatically

» Data management and data analysis is key for the future of R&D and process development in Life Sciences industry «

V-Control

– The scalable DeltaV™ solutions for bioreactors from discovery to production

Getinge is a premier partner of Emerson's OEM program for life sciences. Within this collaboration V-Control has been developed as a joint effort from Getinge and Emerson combining Getinge's state-of-the-art bioreactor systems with Emerson's award winning DeltaV™ automation solution.

V-Control is the scalable DeltaV™ solution for bioreactors from discovery to production. In labs, it harnesses the power of DeltaV™ in an off-the-shelf configurable system at a low reduced price point and for pilot- and production-scale stainless steel or single-use systems it harnesses the power of the DeltaV™ PK Controller in a configurable control system based on user requirements. V-Control combines the best of DeltaV™ automation with Getinge bioprocessing know-how into one platform for process control and data management from discovery to production. The open architecture in V-Control enables users to optimize the DeltaV™ libraries for their processes and allow the user to merge the application with their existing DeltaV™ library. Seamless technology transfer and scalable data transfer result in optimal bioprocesses with shorter development lead times and lower development costs.

V-Control can combine scalable bioreactors from 250 mL up to 6000 L with DeltaV™ automation software as the sole solution from Discovery up to Production for process control and data integration.

Benefits:

- Improved user experience with advanced automation tools
- Minimized scale-up risks with easy technology and data transfer
- Reduced time-to-market and development costs

Features:

- Native open-architecture DeltaV software with tailor-made functions for bioprocessing
- Uses DeltaV™ PCSD library
- Standardized automation software can be customized to meet customer requirements
- Capability to be integrated to an existing system
- Ability to exchange between discovery labs, process development and commercial production
- Open to working with our clients on meeting their standards (Customization services available)
- No hidden costs

Applications:

- Microbial and Cell cultivation
- Batch, Fed-Batch, Perfusion and Continuous cultivation
- Stainless steel bioreactors
- Single-use bioreactors
- Autoclavable bioreactors

Related products:

- Livit Flex
- my-Control
- ez2-Control
- in-Control
- Applikon 250 mL - 20 L
- AppliFlex ST
- Millipore MobiusTM CellReady
- SIP labscale
- Sensors

V-Control Bundle for R&D

– Turn-key bioprocess solution

V-Control for R&D can be fully configured to meet customer needs or can be purchased in pre-configured bundles.

The V-Control bundle is a turn-key solution that includes everything that you need to fit your laboratory with bioreactors and Emerson's DeltaV™ solution. The basic bundle includes 4x 3 L Single-Use AppliFlex or Applikon bioreactors and the computer with V-Control ready to run. The bundle can easily be expanded up to 8 systems to meet your process development throughput requirements. The V-Control bundle also includes training and installation by Getinge professionals, so you are ready to start working immediately with your V-Control system.

Getinge offers additional configuration options to the system, you can contact your local Getinge representative to request a tailor-made V-Control system configuration that fits your demands.

Benefits:

- Readily available off-the-shelf turn-key V-Control packages for labs
- Future proof – easily configurable and expandable to V-Control for Pilot & Production
- Easily switch between single-use and multi-use configurations

Bundle includes:

- V-Control base package with DeltaV™ Discovery including, hardware, software and licenses
- V-Control for R&D can include DeltaV™ Batch add-on
- V-Control support including Emerson's Guardian support
- 4x 3 L AppliFlex ST single-use or the Applikon autoclavable bioreactor
- 4x my-Control hardware, including:
  - 2 variable speed pumps
  - 3 mass flow controllers for air, O_2 and CO_2
  - 2 gas lines for sparger and overlay
  - pH, DO and temperature sensors
  - Heating blanket
  - Stirrer motor
- All required accessories and start-up kit
- Installation and training

V-Control for R&D

– The scalable DeltaV™ solutions for bioreactors in labs

V-Control for R&D is optimized for bioprocessing at lab-scale and combines DeltaV™ Discovery with Getinge's scalable laboratory bioreactors ranging from 250 mL up to 20 L.

DeltaV ™ Discovery is designed for non-production, non-GMP laboratory applications. It has all benefits from DeltaV at a reduced footprint and with lower investment costs.
DeltaV™ Discovery combines process control, data acquisition, visualization, and recipes in one single computer. The DeltaV™ Discovery system can support up to 32 bioreactor units per network and may be expanded with additional DeltaV™ application and operator stations as needed. DeltaV™ Discovery can communicate through OPC with Getinge control systems, such as Livit Flex, my-Control and ez2-control. DeltaV™ is set as the sole interface for operators, reducing training needs and simplifying workflows.

V-Control for R&D is applicable to Getinge's single-use and multi-use bioreactor systems used for cell culture and microbial applications. These lab-scale bioreactor systems can be configured to meet customer requirements, such as multiple gas flows, integration with 3rd party sensors, additional pumps, and additional pumps. Furthermore, V-Control can be expanded with several add-on packs and be integrated with external historians, like OSIsoft PI®.

V-Control for Pilot & Production

– The scalable DeltaV™ solution for bioreactors in pilot and production

V-Control for Pilot & Production is the scalable DeltaV™ solution for bioreactors in pilot and production application. V-Control for Pilot & Production uses Emerson's DeltaV™ software and DeltaV™ PK Controller in combination with stainless steel and single-use bioreactors. It has a user-friendly, alarm based operator user interface and is 21 CFR part 11 compliant.

V-Control for Pilot & Production benefits from the open architecture and native DeltaV™ tools that ensure easy integration into downstream facilities with other DeltaV™ systems. It can easily be expanded with several add-on packs like DeltaV™ Batch and DeltaV™ Configuration Audit Control. The seamless technology transfer from R & D to Pilot & Production allows for reduced time-to-market and scale-up cost savings.

DeltaV™ Batch

DeltaV™ Batch is an add-on that can be integrated into the V-Control for R&D and V-Control for Pilot & Production solution. It simplifies R&D workflows and reduces risks through process automation. DeltaV™ Batch can be used to design and execute batch processes in DeltaV™, setting pre-defined phases for common bioprocessing steps. Due to V-Control's open architecture the phases can easily be used by operators to create recipes, which can be later used to further automate and control bioprocesses. Depending on PC configuration the Batch Historian is available as well.

Training in these skills is available globally through local Emerson partners. Getinge also offers support to help users to build and expand recipes based on specific process demands.

AppliSens LumiSens

– Optical DO sensor

Ready to go! The AppliSens LumiSens sensor can be used right after autoclaving. Polarization is no longer needed as compared to traditional polarographic DO_2 sensors, and the need for calibration is significantly decreased to only once per year instead of calibrating for every run.
The RedFlash optical technology allows accurate measurements especially in the low oxygen concentration ranges where classic probes are less accurate.

The AppliSens LumiSens sensor is available for our Applikon bioreactors up to 5 L. The smart sensor design separates the electronics from the glass sensor part, guaranteeing a long sensor life with repeated sterilizations.

Benefits:

- Longer sensor life time since sensor electronics are not sterilized
- Direct use after autoclaving as no polarization is needed
- Reduced maintenance costs since no electrolyte and membranes have to be replaced

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

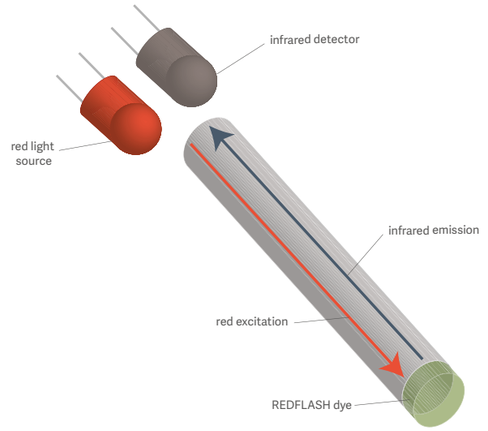
Features:

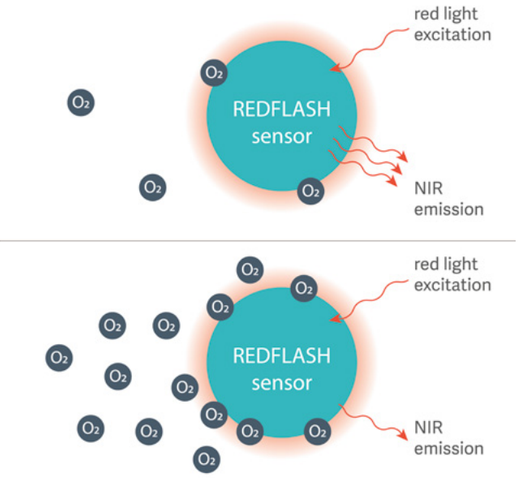
- Health status monitor to show sensor condition
- Insensitive to CO_2 fouling
- Ø8 mm sensor for accurate reading on small scale
- M12 thread integrated for direct mounting in top plate
- No interference with biotech-molecules, such as mCherry, Texas Red and Chlorophyll a & b due to RedFlash technology

How the AppliSens LumiSens works:

The measurement principle is based on the phase shift between excitation and emission, which is directly related to the partial pressure of oxygen.

The RedFlash technology is characterized by high precision and reliability, low cross-sensitivity and fast response. The red light excitation significantly reduces interferences caused by auto fluorescence and reduces stress in biological systems. Besides, due to the excellent luminescence brightness of the RedFlash indicator, the actual sensor matrix can be prepared much thinner, leading to fast response time of the sensor.





AppliSens LumiSens – two parts:

Optical sensor on tip of stainless steel sensor housing

Green fluophore on tip of replaceable glass tube

Related products:

- DO_2 LumiSens sensor Ø 8 mm (L = 115 / 135 / 185)
- Glass tube for DO_2 LumiSens sensor (L = 115 / 135 / 185)
- **Sensor holder G¾" port M12 thread**

AppliSens smart pH Sensors

– Smart pH measurement

In the biotech and pharmaceutical industry precise monitoring of the pH value during bioprocesses is paramount. The pH directly impacts productivity, stability, and the analysis of active ingredients, making it essential to have accurate and reliable pH sensors. Traditional pH sensors often require frequent recalibration when transitioning to different systems, leading to downtime and potential errors in data collection. Getinge recognizes these challenges and has taken significant steps to address them.

The AppliSens smart pH sensors mark a significant advancement in bioprocess monitoring technology. These sensors are equipped with several key features that set them apart from traditional sensors:
- VP8 connector
- Sensor chip
- Integrated pt1000 temperature sensor
- Data storage and calibration

Benefits:

- Efficient Calibration
- Reliable Performance
- Less maintenance needed

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Features:

- Sensor health
- Storage of calibration data (offset, slope, sample correction for pH sensors)
- Integration of a temperature sensor for probe calibration and temperature compensation

Specifications:

AppliSens smart pH Sensors	
Diameter	12 mm
pH range	2 – 9 pH
Temperature range	10 - 80°C
Maximum temperature (sterilizing)	135°C
Maximum pressure	4 bar
Zero Point (pH7) @ 25 °C	0 ± 30 mV
Sensitivity @ 25 °C	59.1 mV/pH
Response time (t90)	< 45s pH 4- pH 7 @ 25 °C
Materials in contact with medium	Barium glass, Lithium glass, Teflon, Silicone (o-ring)

Related products:

- AppliSens smart pH sensor Ø 12 mm (L = 235 / 325 / 425 / 590)
- AppliSens smart pH Livit Link
- USB-C AppliSens smart pH cable (L = 0.5 / 1.2)
- Conditioning vial for 12 mm sensors

AppliSens pH Sensors

– Accurate pH measurement

In your industry it is vital to have precise information about the pH value of the bioprocess. The pH level directly affects viability, productivity, and stability of the cells and it influences activity and analysis of active ingredients. The AppliSens pH+ sensor has a fixed sleeve diaphragm that reduces the influence of the culture medium on the pH measurement. Compared to classic diaphragm types, this sleeve diaphragm increases measuring accuracy and increases the lifetime of the sensor which is vital for long lasting biotech cultivation processes.

Benefits:

- Low sensitivity to fouling and thus drifting due to sleeve diaphragm
- Accurate measurement
- Stable signal over longer time

Specifications:

AppliSens pH Sensors	
pH range	1 - 12 pH
Temperature range	1 - 135°C
Electrode zero point (E7)	+/-15 mV
Electrode slope (S4/7)	> 98%
Isothermal Intersection- pH (Eiso)	6.5 - 8
pH Range	4 - 9
Membrane resistance @ 25°C (ohm)	< 1200
Membrane resistance @ 37°C (ohm)	< 500
Calibration drift in Buffer 9 (mV / min)	< 2
Stirring Error (Buffer 9 @ 25 °C - pH)	< 0.05
Drift 72 hours after Autoclaving pH	< 0.13
Zero-point drift per week in PBS (pH)	< 0.05
Response Time	90%

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Features:

- Robust design by using tempered glass shaft
- Sensor head occupies minimal space on bioreactor top plate
- Withstands repeated SIP and CIP cycles
- Standardized PG 13.5 connection guarantees interchangeability with other bioreactor brands

Related products:

- AppliSens pH gel sensor Ø 8 mm (L = 115 / 135 / 185)
- AppliSens pH gel sensor Ø 12 mm (L = 120 / 235 / 325 / 425 / 590)
- AppliSens pH sensor cable (L = 0.65M / 2.0M)

AppliSens smart DO_2 Sensors

– Smart DO2 measurement

ccurate measurement of DO2 is critical as it impacts the success of biotechnological processes, influencing the growth and productivity of microorganisms and cells. The AppliSens smart DO2 sensor represents a significant improvement over the traditional sensor. Its advanced features, including the sensor chip, built-in temperature sensor, and health status indicator, provide enhanced connectivity, process efficiency, and peace of mind for biotechnological applications.

The smart sensor ensures that data is stored and therefore the need for frequent recalibration when transitioning to different systems is eliminated. As such, these sensors can be pre-calibrated within a controlled environment and subsequently connected to field systems. The stored data contains calibration parameters such as offset, slope, and sample corrections, alongside uptime and sensor health. The new smart DO sensor consists of a probe, a transmitter (resembling a gray metallic cylinder) known as the Livit Link. The probe is equipped with internal memory, which accounts for the "smart functionality." This functionality can be used when the smart probe is paired with the Livit Link and Livit software.

Benefits:

- Enhanced connectivity
- Optimizing process efficiency
- Pre-calibration in controlled environment

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Features:

- cGMP compatible by using FDA approved materials
- Withstands repeated SIP and CIP cycles
- Standardized PG 13.5 connection guarantees interchangeability with other bioreactor brands

Specifications:

AppliSens smart DO_2 Sensors	
Diameter	12 mm
Ra-Value	Ra <0.4 µm
Temperature range	10 - 80°C
Maximum temperature (sterilizing)	135°C
Maximum pressure	4 bar
Optimum Polarization potential	-800 mV
Polarization Potential amplifier	-675 mV
Minimum polarization time	6 hours
Polarization Current	33-66 nA @ Air / 25 °C / 1.013 bar / 100%RH 65-98 nA @ Air / 40 °C / 1.013 bar / 100%RH 300-350 nA @ O2 / 40 °C / 1.013 bar / 0%RH

Related products:

- AppliSens smart DO2 sensor Ø 12 mm (L = 235 / 325 / 425 / 590)
- AppliSens smart DO Livit Link
- USB-C AppliSens smart DO cable (L = 0.5 / 1.2)
- DO2 electrolyte
- DO membrane kits

AppliSens DO_2 Sensors

– Accurate DO_2 measurement

Measurements of dissolved oxygen (DO_2) in biotechnological processes is a basis for process optimization and maximization of the product yield. A microorganism or cell responds to the oxygen concentration in regulating its overall metabolism. Therefore, knowledge of the DO_2 concentration and its proper control during the process are of great importance.

The AppliSens DO_2 sensor is specifically designed for long-term, stable and accurate measurements in bioprocesses. The DO_2 sensor has a titanium membrane module to minimize the measurement drift. The autoclavable polarization module allows polarizing of your DO_2 sensor while autoclaving your bioreactor system, resulting in a reduced start-up time of your cultivation.

Benefits:

- Low drift by usage of titanium and PEEK material
- Easy calibration & short response time
- Optimal cleanability due to fully electro-polished surface

Specifications:

AppliSens DO_2 Sensors		
Optimum polarization potential	- 800 mV @ 40°C	
Polarization potential amplifier	- 675 mV	
Max. pressure where linearity is guaranteed	4 bar	
Max. sterilization temperature	135°C	
Minimum polarization time after autoclaving	6h	
Polarization current	Air / 25 °C / 1.013 bar / 100 % RH Air / 40 °C / 1.013 bar / 100 % RH O2 / 40 °C / 1.013 bar / 0 % RH	(33 - 66) nA (65 - 98) nA (300 - 350) nA
Response time gas phase 20 °C	t (90%)	(20 - 30) s
Response time gas phase 40 °C	t (90%)	(10 - 20) s
Response time gas phase 60 °C	t (90%)	(5 - 10) s
Drift between 15h - 5 days	< 0.2 % / day	
Drift between 5 days and 7 days	< 0.1 % / day	
Drift between 7 days and 30 days	< 0.05 % / day	

Applications:

- Microbial and cell culture
- Cell and gene therapy
- Cellular agriculture
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Features:

- cGMP compatible by using FDA approved materials
- Withstands repeated SIP and CIP cycles
- Standardized PG 13.5 connection guarantees interchangeability with other bioreactor brands

Related products:

- DO_2 sensor Ø 8 mm
- DO_2 sensor Ø 12 mm
- DO_2 sensor cable
- DO electrolyte
- DO membrane kits

AppliSens RedOx Sensors

– Accurate oxygen measurement

The AppliSens RedOx potential (Reduction / Oxidation) of a bioreactor culture can be measured using an AppliSens RedOx sensor. The value of the reading of the sensor can depend on pH, growth phase, growth medium components, and fermentation end products (especially fermentation acids and hydrogen). RedOx measurement is also used in anaerobic fermentations as an alternative to the Dissolved Oxygen sensor which does not give much process information in anaerobic situations.

Benefits:

- Accurate measurement
- Short response time
- Stable signal over longer time

Applications:

- Microbial and cell culture
- Anaerobic bioprocesses
- Screening studies
- Media optimization
- Process optimization
- Batch, Fed-Batch, Perfusion and Continuous cultivation

Features:

- Robust design by using tempered glass shaft
- Sensor head occupies minimal space on bioreactor top plate
- FDA approved materials
- Withstands repeated SIP and CIP cycles
- Standardized PG 13.5 connection guarantees interchangeability with other bioreactor brands

Specifications:

AppliSens RedOx Sensors	
Diaphragm Ceramic	Diaphragm
Indicator electrode shape	Ring
Indicator electrode type	Pt
Measuring range	–2000 ... 2000
Measuring unit	mV
pH range	0 ... 14
Reference electrolyte type	c(KCl) = 3 mol/L
Reference system	LL system
Shaft material	Glass
Temperature range, long-term (°C)	–5 ... 135

Related products:

- AppliSens RedOx sensor Ø 8 mm (L = 115 / 135 / 185 mm)
- AppliSens RedOx sensor Ø 12 mm (L = 110 / 154 / 235 / 325 / 425 / 590 mm)
- AppliSens RedOx sensor cable (L = 0.65 m / 2.0 m)

BioSep

– An advanced Cell Retention Device

The BioSep system is a unique cell retention device for high-density perfusion processes. Using high frequency resonant ultrasonic waves to separate cells instead of a physical mesh or membrane, it offers all the benefits of traditional devices but without their inherent problems and limitations. The BioSep, based on the technology of acoustic resonance, is a non-fouling / non-clogging cell retention system. The BioSep can be applied in both R&D (max. 1 L/day harvesting volume), process development and on production scale (1000 L/day).

Benefits:

- Scalable perfusion device (0,1 – 1.000 L / day harvesting volume)
- No fouling or blocking for long term operation (no damage to cells)
- Automatic removal of cell debris

Applications:

- Perfusion cultures
- Concentration of cell/particles
- Process development studies
- Washing
- First step in downstream processing

Features:

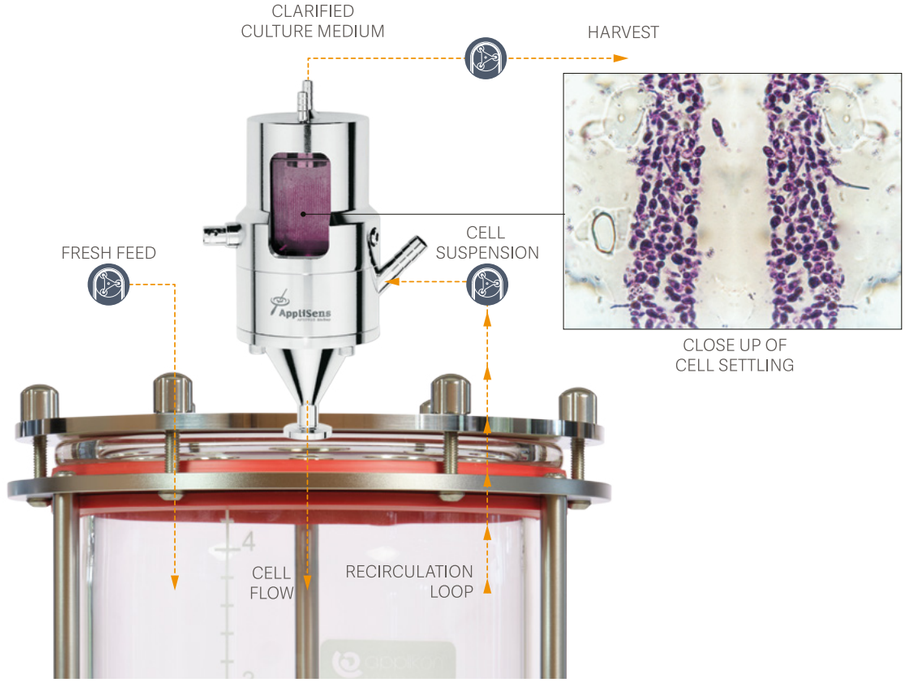
Options in control platform

- Long-term cultivation possible (> 6 months)
- Stand alone control solution
- Easy to install and to operate
- Compatible with any brand bioreactor system
- Proven under cGMP conditions
- High separation efficiency (up to 99%)
- No damage to the cells
- For multi-use and single-use bioreactors

Specifications:

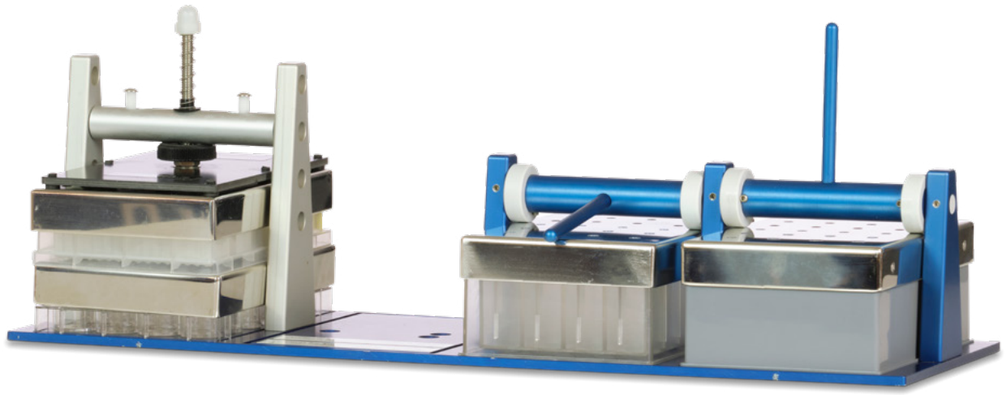
BioSep system	1L	10L	50L	50L	1000L
Maximum perfusion rate	1 L/day	7 L/day	45 L/day	200 L/day	1000 L/day
Minimum perfusion rate	0.1 L/day	0.7 L/day	4.5 L/day	20 L/day	100 L/day
Separation efficiency	Up to 99% (depending on cell concentration and perfusion flow)				
Minimum cell concentration	2 x 10^5 cells/ml (depending on cell size)				
Bioreactor connection	6 mm OD tube	12 mm OD tube	Mounted separately	Mounted separately	Mounted separately
Medium inlet	3 mm hosebarb	6 mm hosebarb	10 mm hosebarb	0.5" TC	0.5" TC
Return line to bioreactor	3 mm hosebarb	6 mm OD diptube	0.5" TC	0.5" TC	0.5" TC
Perfusion outlet	3 mm hosebarb	6 mm hosebarb	6 mm hosebarb	0.5" TC	0.5" TC
Weight	0.1 kg	0.5 kg	1.5 kg	13 kg	70 kg
Resonator volume	0.7 mL	7 mL	50 mL	290 mL	1450 mL
BioSep Controller	APS 995	APS 990	APS 990	APS 992	APS 993
BioSep Controller Power	15 Watt	150 Watt	150 Watt	350 Watt	1500 Watt
BioSep Controller Dimensions (DxWxH, mm)	Combined with my-Control	305x130x130	305x130x130	450x400x135	450x300x450
BioSep Controller Weight (kg)	Combined with my-Control	3.5	3.5	17.6	43

Typical configuration of acoustic cell retention system



Micro-Flask by Duetz

– Cultivation in Microtiter Plates



The Micro-Flask system facilitates reproducible and reliable culturing on microtiter plates. The system consists of sandwich covers, cover clamps and a cryo-replicator (for simultaneous inoculation of the plate without having to thaw the frozen stock).
The Micro-Flask enables a single person to grow and test thousands of strains simultaneously with a minimum of repetitive handling.

Benefits:

- Simultaneous and reproducible sampling of 96 frozen glycerol stocks
- Low and uniform evaporation rates for every well
- Seal and sterile barrier for individual wells prevents cross contamination

Applications:

- High throughput screening and distribution of mutant and construct libraries e.g. in *E. coli* or yeast
- Metabolic flux studies and high-throughput screening for high activity prokaryotic or eukaryotic mutants
- Comparative studies, e.g. clinical isolates
- Growth medium optimization for cell lines or production strains

Features:

- Turns 6, 24 and 96-well microtiter plates into individual micro-reactors
- Oxygen transfer similar to fermenters

Specifications:

Type of microtiter plate	Well volume (µL)	Culture volume (µL)	Orbital shaking frequency (rpm)	Shaking amplitude (mm)	O_2-transfer rate (30°C, air, 1 bar) (mmol O_2 / l / h)	Headspace refreshment rate	Evaporation rate per well (at 30°C)
24-square deep-well polypropylene, 17x17 mm, depth 40 mm	11000	2500	300	50	51	2.5 mL / min (1 VVM)	50% humidity: 50 µL H_2O per day 75% humidity: 25 µL H_2O per day
		2500	300	25	39		
		2500	220	50	35		
		4000	300	50	24	2.5 mL / min (0.6 VVM)	
		4000	220	25	24		
24-round low-well polystyrene, 16 mm, depth 18 mm	3000	750	300	50	40	1.1 mL / min (1.4 VVM)	50% humidity: 30 µL H_2O per day 75% humidity: 15 µL H_2O per day
		750	300	25	25		
		1000	300	50	30	1.1 mL / min (1.1 VVM)	
		1000	300	25	19		
96-square deep-well polypropylene, 8x8 mm, depth 40 mm	2400	500	300	50	38	2.5 mL / min (1 VVM)	50% humidity: 22 µL H_2O per day 75% humidity: 11 µL H_2O per day
		500	300	25	12		
		750	300	50	24	2.5 mL / min (0.6 VVM)	
		750	300	25	7		
		1000	300	50	18	1 mL / min (1 VVM)	
		1000	300	25	3		
96-round low-well polystyrene, 6.5 mm, depth 11 mm	380	100	300	50	39	2.5 mL / min (1 VVM)	50% humidity: 6 µL H_2O per day 75% humidity: 3 µL H_2O per day
		100	300	25	20		
		150	300	50	32	2.5 mL / min (0.6 VVM)	
		150	300	25	16		
		200	300	50	12	250 µL / min (1.3 VVM)	
		200	300	25	12		

Related products:

Microtiter plates:
- 24-square deep-well plates
- 24-round low-well plates
- 96-square deep-well plates
- 96-round low-well plates

Anaerobic Fermentation Monitor

– Simple Parallel Cultivation

The Anaerobic Fermentation Monitor (AFM) is a robust and user-friendly laboratory parallel fermentation system that allows for accurate comparisons of carbon conversion rates and yields for six simultaneous anaerobic fermentations.

Monitoring the amount of gas that evolves from a fermentation broth under well controlled conditions is a reliable comparison method that has proven to be very useful in all industries that use anaerobic fermentations. Because carbon dioxide production is stoichiometrically coupled with carbon source conversion, very useful metabolic data can be obtained. The AFM provides accurate measurement of gas from six parallel fermentations with a system that is low maintenance and easy-to-use.

Benefits:

- Very user friendly laboratory device for monitoring anaerobic, metabolic yeast activity for alcohol production
- Proven value for research and QA purposes in all fields of yeast research and (bio) ethanol production
- Accurate comparison of conversion rates and yields under different conditions such as temperature, strain type, carbon source or nutrients

Applications:

- Measure conversion rates and yields of lignocellulose hydrolysates into biofuels
- Test and compare different yeast strains or different feedstock/substrates
- Quality control of regular/commercial yeast
- Quality control of traditional feedstock (such as molasses)
- Conversion of wort into beer
- Conversion of grape juice into wine
- Alcohol tolerance and toxicity studies
- Industrial and academic research on yeast and potable alcohol/bio-ethanol/bio-butanol production

Features:

- Six independent yeast fermentations can be carried out simultaneously
- Stirrer speeds and temperatures can be set or time programmed for each fermenter flask individually
- Fully controlled with user-friendly control and data analysis software
- Automatic generation of advanced reports containing all measured data, data analysis tables and corresponding graphs
- Very strong magnetic stirrers, able to handle very viscous media

Specifications:

Anaerobic Fermentation Monitor	
Total volume	6 reactors of 500 mL
Minimum working volume	400 mL
Drive system	Magnetically coupled stirrer
Maximum stirrer speed	50 - 1450 rpm
Impellers	Marine type
Temperature • Measurement: • Control: • Temperature range:	 Pt-100 sensor in central stirrer bar Heating via central stirrer bar + 5 ˚C (ambient) to 75 ˚C
Dimensions (DxWxH)	330 x 920 x 825 (mm)
Empty Weight (kg)	75 kg

Related products:

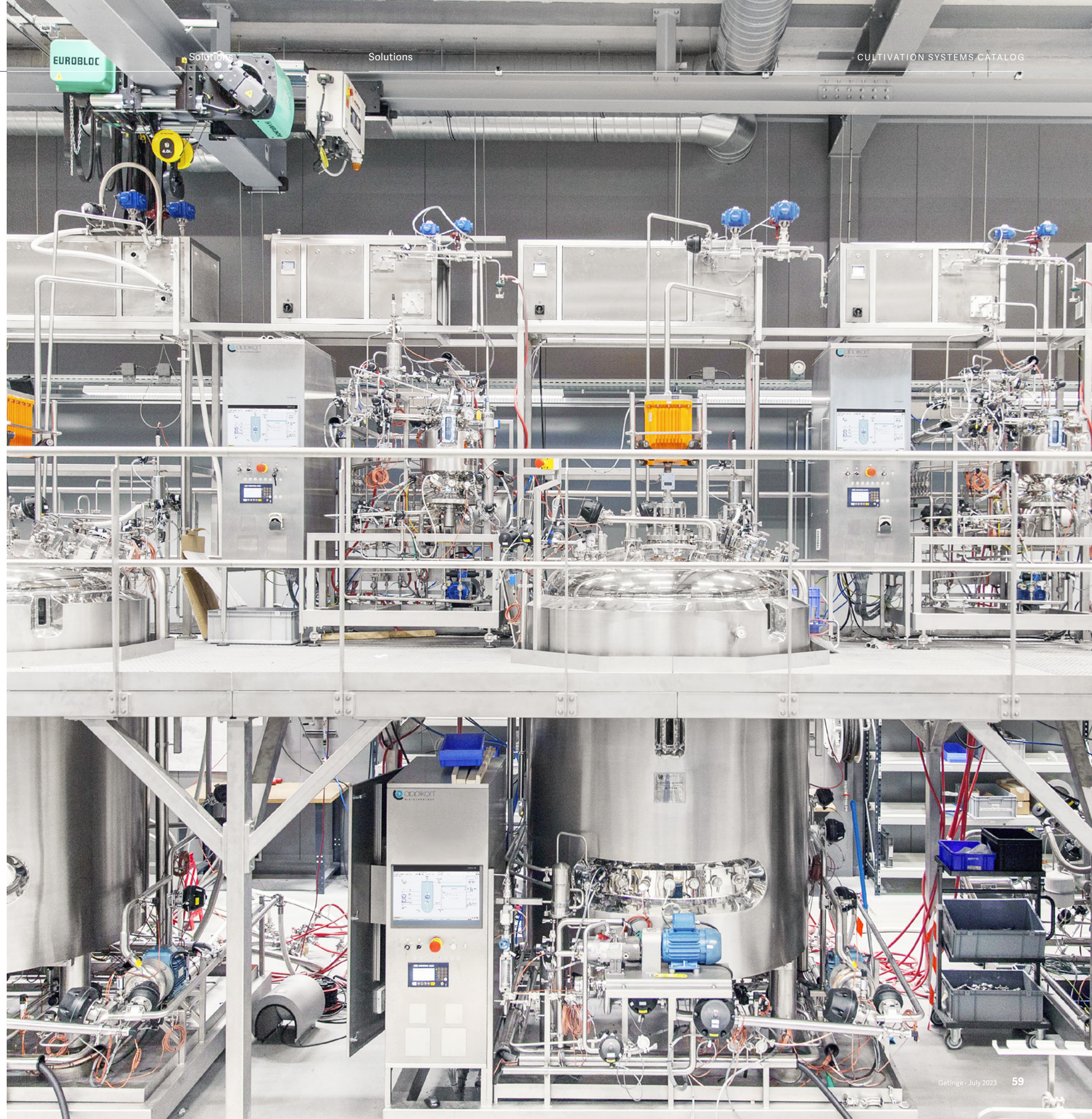
Fermenter vessels:
- 500 mL Schott Duran Flasks

Special Projects

– Customized Solutions

Getinge bioreactors play a key role in the life science industry as an essential tool for the large-scale production of life saving vaccines, cell and gene therapies, and biopharmaceuticals. The processing steps leading to these products can be complex, requiring tailor-made systems. This is where Getinge steps in. We provide the industry with solutions – both for development of new products and for the expansion of production capacity. These projects can range from very special mini bioreactors to a complete line of cGMP production systems ranging up to several thousand liters systems.

With over 40 years of experience we can design any system to suit your needs. Using modern design technologies, we will guide you through the process - from initial idea to final product. With advanced communication tools, verification tests and full documentation we ease all processes - making a product that exceeds your expectations. With our state-of-the art facilities we are capable of manufacturing your perfect bioreactor system, no matter how complex. Our ISO 9001 certificate underlines the high quality level of our work and accompanying documentation. Our worldwide distribution network is there to guarantee the best after sales support and to make sure your systems stay in optimal working condition.



Getinge Service

– Total Process Control for You

With Getinge, service goes beyond replacing gaskets. Service is about in depth product knowledge to provide best in class preventive maintenance. Service is an investment in reliable equipment, a reliable process and about providing advice to the to help improve efficiency. In Getinge Service you will find our complete service offer to ease your daily challenges.

Getinge Service for bioreactor systems contains

- Workflow Optimization & Application Support
- Quality & Compliance
- Standard Service
- Extended Warranties
- Installation, Relocation and Retrofitting Services
- On-Demand Service

Workflow Optimalization & Application Support

Getinge employs a team of bio-process experts. This team is available to give you advice on basic or advanced process optimization questions involving process scale-up, aeration, mixing, temperature, pH and Dissolved Oxygen control and other process controller settings. Our in-house laboratory is equipped to run cultures and mimic your process conditions to be able to advise you based on hands-on experience. We come to you to help improve your current workflow and bio-processes or even set-up complete new ones. Please contact us and we will be your partner.

Quality & Compliance

All Getinge equipment is tested thoroughly throughout the manufacturing process. During our in house verification processes we perform comprehensive tests on all Getinge equipment. All quality documentation is supplied with our systems. The quality documentation is setup in such a way that it is ready to use for your validation and qualification process. Tailored to your requirements we can assist with Factory Acceptance Tests (FAT), commissioning, Site Acceptance Test (SAT) and IV/OV.

We bring over 40 years of experience with cGMP and EUDRALEX in verification, validation and qualification. Our projects department can assist your in defining your requirements right from the start. It will make your life easier knowing that our experts in the bioreactor field have defined your URS so that no detail is overlooked and all specifications are realistic and achievable.

Standard Warranty

All Getinge equipment is guaranteed for one year after delivery against defective materials and workmanship. All component parts of our products are covered by this warranty, except for normal consumable items such as glassware, sensors, O-rings and gaskets etc. Warranties are voided by unauthorized service of equipment.

Extended Warranties

We are happy to extend our warranty for an additional 1 or 2 years when we are sure the equipment is well maintained by a service technician trained by Getinge Applikon. We can then offer you our 3 or 5 Year Service Plan with following features:

3 Year Service Plan:

- The 1 year standard warranty from delivery date is extended with an additional 1 year, bringing the total warranty period to 2 years.
- Within this service plan a service technician trained by Getinge Applikon will visit your site one year after installation and 2 successive years to perform a Preventive Maintenance.
- During this Preventive Maintenance visit the equipment is inspected and wear and tear parts are replaced. Calibration of sensor inputs is verified, mass flow controllers (if present) and electronics are checked for accuracy.
- Travel-, working hours and parts used for Preventive Maintenance are included.
- Automatic software and firmware updates are included to give you access to all the extra functionality that we develop over time.
- 10% discounted rate for Getinge organized training and seminars as a bonus.
- 5% discount on hardware upgrades and relocation services.
- Priority given to all Service requests.

5 Year Service Plan:

- The 1 year standard warranty from delivery date is extended with an additional 2 years, bringing the total warranty period to 3 years.
- Within this service plan a service technician trained by Getinge Applikon will visit your site one year after installation and 4 successive years to perform a Preventive Maintenance.
- During this Preventive Maintenance visit the equipment is inspected and wear and tear parts are replaced. Calibration of sensor inputs is verified, mass flow controllers (if present) and electronics are checked for accuracy.
- Travel-, working hours and parts used for Preventive Maintenance are included.
- Automatic software and firmware updates are included to give you access to all the extra functionality that we develop over time.
- 20% discounted rate for Getinge organized training and seminars as a bonus.
- 10% discount on hardware upgrades and relocation services.
- Priority given to all Service requests.

Installation, Relocation and Retrofitting Services

- The Getinge installation team will assist you in unpacking the equipment and verifying that all components are in the right condition after shipping and storage. After this initial inspection the installation team will assist in installing the equipment in the designated location. We can assist in connecting the systems to the site utilities and verifying that the utilities are of the right quality. After connecting the equipment, the installation inspection will be done. This inspection will make sure that the systems are properly placed, well connected and are ready to go. Following this is a functionality test to show that the system performs as specified when ordered.
- When you need to relocate your bioreactor system, our after sales support team can assist you with this. Your advantage is that the relocation will be done with a minimum of down time and once relocated your equipment is tested and ready to go. Our de-& re-commissioning service includes, access check, utilities check, customer regulations check, siting assistance, verification of and connecting to connections utilities, functionality tests and start up test procedures. Of course all these actions are fully documented to keep your system in a validatable situation.
- With our service plans your bioreactors will last for many years. After many years of use you may want to consider a controller upgrade to make use of new electronic and software functionality. We can offer different solutions for this. Options are: Controller replacement, Actuator replacement/upgrades, and Sensor replacement/upgrades. These replacements offer an upgraded and updated bioreactor system that is ready to go for a number of years. Upgrades can be done in our factory or at your site. Contact your local Getinge office for details and options.

On-Demand Service

Getinge equipment is manufactured to the highest standards using carefully selected quality components. To ensure a long, trouble free life for your bioreactor we recommend a regular annual service check as a preventive rather than any corrective procedure.

Preventive Maintenance

A complete annual service check of all components, performed by a service technician trained by Getinge Applikon, complete with calibration checks and functionality tests for the bioreactor, its control system and its software. All tests are documented to provide you and us with a service history of your bioreactor. For all Getinge equipment we have a “fixed price” for an on-demand Preventive Maintenance.

Software Support

Our experts will assist you in writing advanced control statements and developing control recipes for your processes. This will allow you to make optimal use of your bioreactor system and will give you better results in a shorter time.

Non-Getinge Equipment Support

We are willing to service non-Getinge Applikon bioreactor systems when possible. When you need high quality, fast and knowledgeable support to get the most out of your bioreactor systems talk to us - we are able to assist you.

Technical Support

Being a truly global operation, our offices worldwide will give you the best customer experience possible. Our trained support staff is available for you to answer your questions and trouble shoot your issues.

Our “On-line Helpdesk” supplies our local sales and service organizations with the latest information about our products. The Helpdesk holds all technical service drawings manuals so all our service engineers have the most up-to-date information at their fingertips when they perform field service. A special section of our On-line Helpdesk is available for customers. This section contains user manuals, white papers, demo versions of software, trouble shooting tips and training programs

Getinge Academy

– Be the Expert

Get trained and be ready! Well-trained scientists, operators, and engineers make sure that our systems are fully utilized in your operations. In our vision, training and instruction on how to operate our scientific equipment to make optimal use of its capabilities is not a one-time occurrence, but needs to be repeated on a regular basis.

That's why we created a curriculum to fit your needs. The courses range from educational hands-on and theoretical "Fermentation & Cultivation" sessions, to advanced SCADA/PIMS software training. Our team of bioprocess experts is ready to give you advice on basic or advanced process optimization questions, including process scale-up, aeration, mixing, temperature, pH, and dissolved oxygen control, plus other process controller settings.

Our in-house laboratory is equipped to run cultures and to mimic your process conditions so that recommendations can be drawn up for you based on hands-on experience. Through our Workflow Optimization Assessment we can even design training programs for your employees, as well as put together a curriculum for you. Training can also be held at your facility for a private training session or in a central location near you for general access. Customized training can be organized on demand, focusing on your specific process challenges. You can ask us to come to you to help improve your current workflow and bio-processes or even set-up completely new ones. Please contact us and we will be glad to act as your partner.

Available training courses

- Basic Cultivation course
- Advanced Cultivation course
- Basic Cell Culture course
- Basic Lucullus® PIMS training
- Advanced Lucullus® PIMS training
- On-Demand Service


GETINGE

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