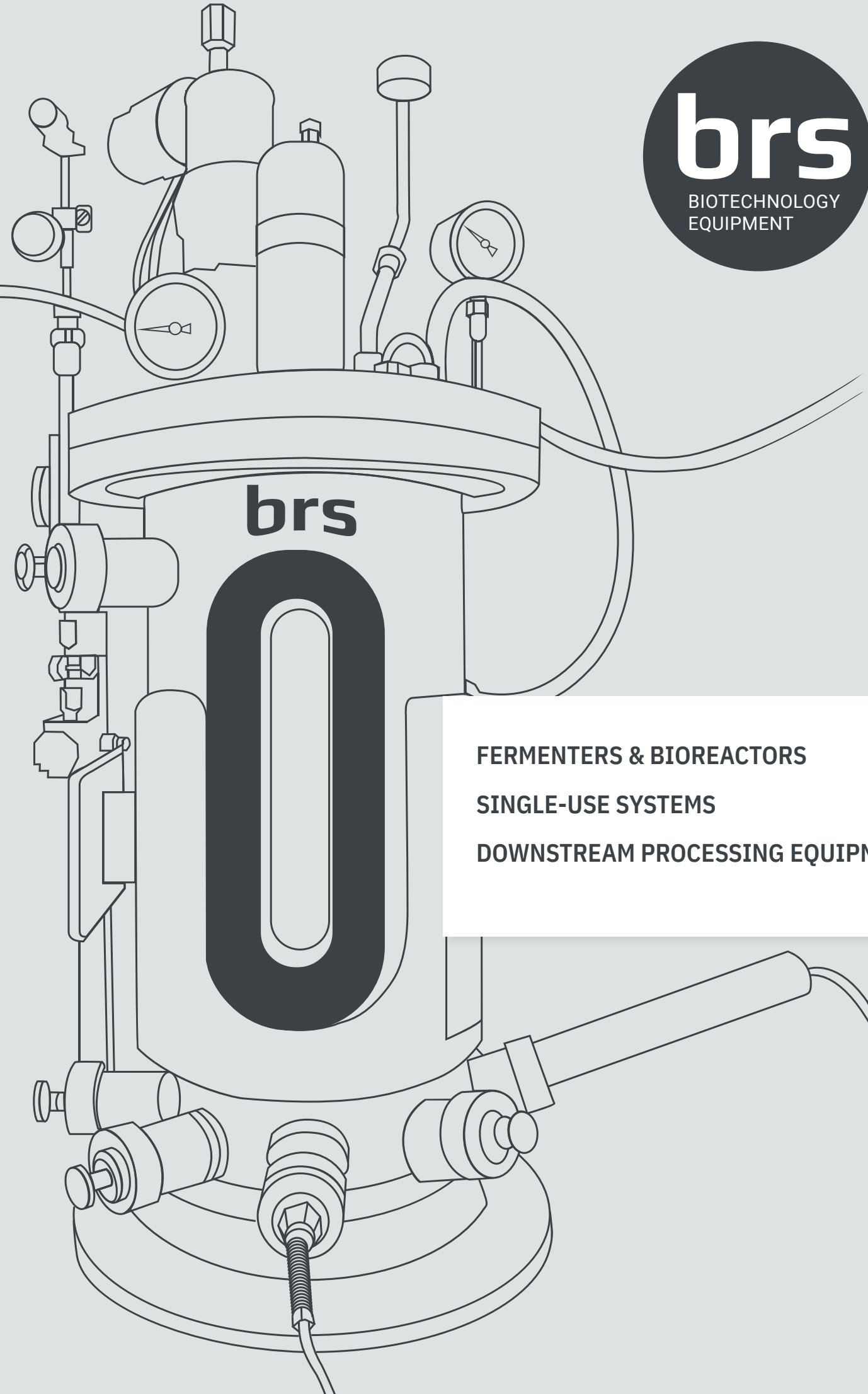

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BIOTECHNOLOGY
EQUIPMENT

FERMENTERS & BIOREACTORS

SINGLE-USE SYSTEMS

DOWNSTREAM PROCESSING EQUIPMENT

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BIOTECHNOLOGY
EQUIPMENT

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Σ OVERVIEW

The idea behind our equipment is value, i.e. affordability paired with reliability.

To lower costs we manufacture in Mainland China, use simple designs and while there is always an option to meet all your requirements and fully customize for process you need, by default we offer two setups with all necessary functionality for different tasks: Basic for agriculture, veterinary and food industries and Advanced for pharma and advanced microbiology, with nothing redundant in both setups for cost optimization.

Reliability is achieved via simple architecture and sound technological solutions with main components supplied by industry leaders. We strive for easy and trouble-free setup, maintenance and operation.

EQUIPMENT

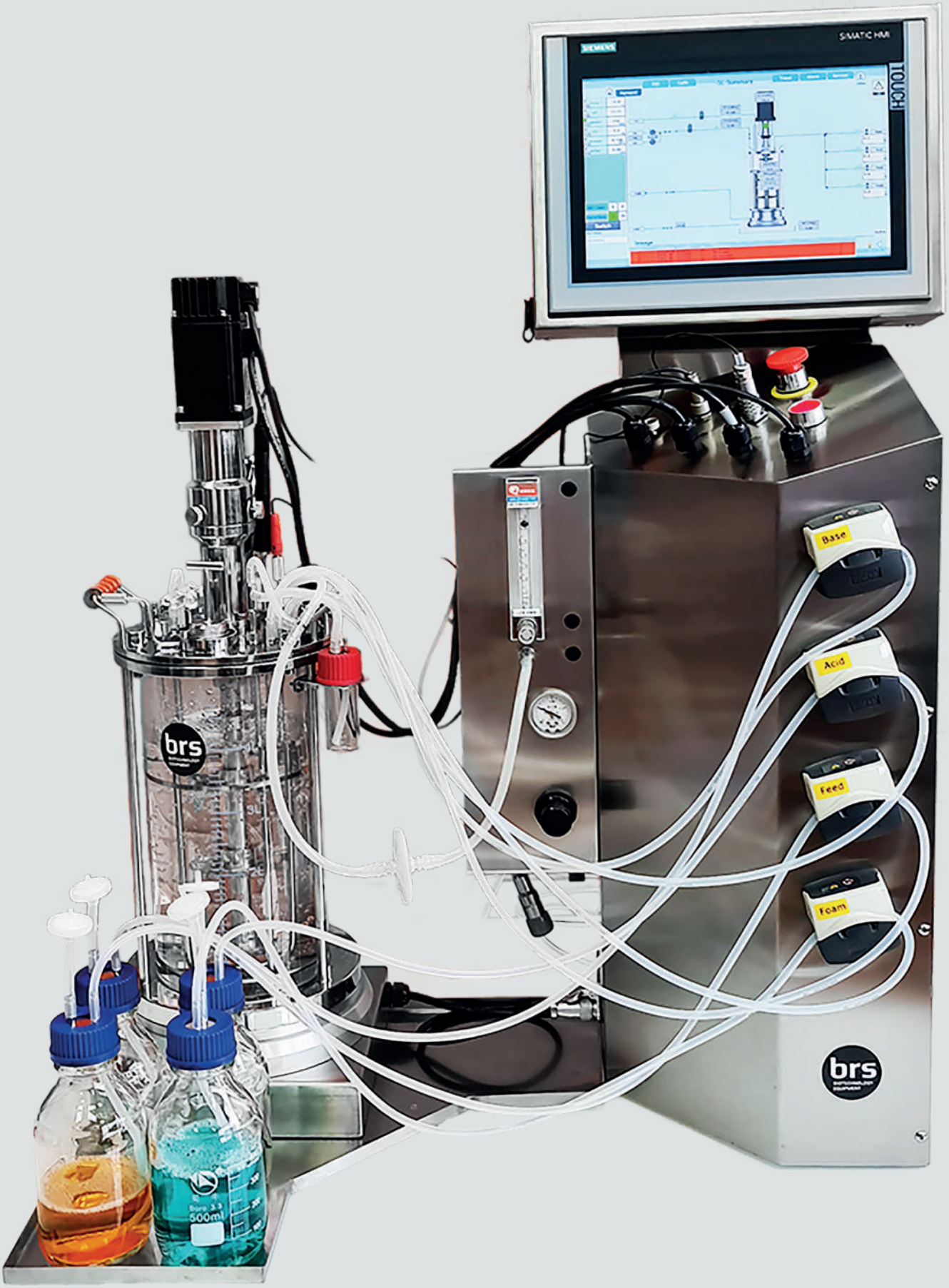
We offer a wide range of equipment for biotechnological, food and pharmaceutical industries: lab fermenters with 1-20 l total volumes, pilot fermenters with volumes ranging from 5 to 80 l, industrial fermenters with volumes from 100 l to 5000 l and up to 60000 l, single-use solutions for biopharma (rocking and stirred tank bioreactors, mixers, customized single-use bags), downstream processing equipment, CIP systems and steam sterilizers, spray and freeze dryers.

We provide engineering solutions for upstream and downstream processes in biotechnological plants. Our engineering team develops customized technical solutions for bioreactors, media & buffer preparation vessels, CIP and distribution systems, mobile tanks and formulation vessels.

We follow and adhere to the guidelines as set forth for cGMP and GAMP where requested.

SERVICE

All equipment is supplied with 1-year warranty. With our service center in Estonia, we provide full-time support for European customers and our engineers will arrive at any part of Europe in 24h.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TOUCH
Base
Acid
Feed
Foam
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LABORATORY FERMENTERS AND BIOREACTORS

BRS autoclavable lab fermenters and bioreactors are designed for research applications and fermentation process optimization. It is also used in microbial physiology studies.

FEATURES

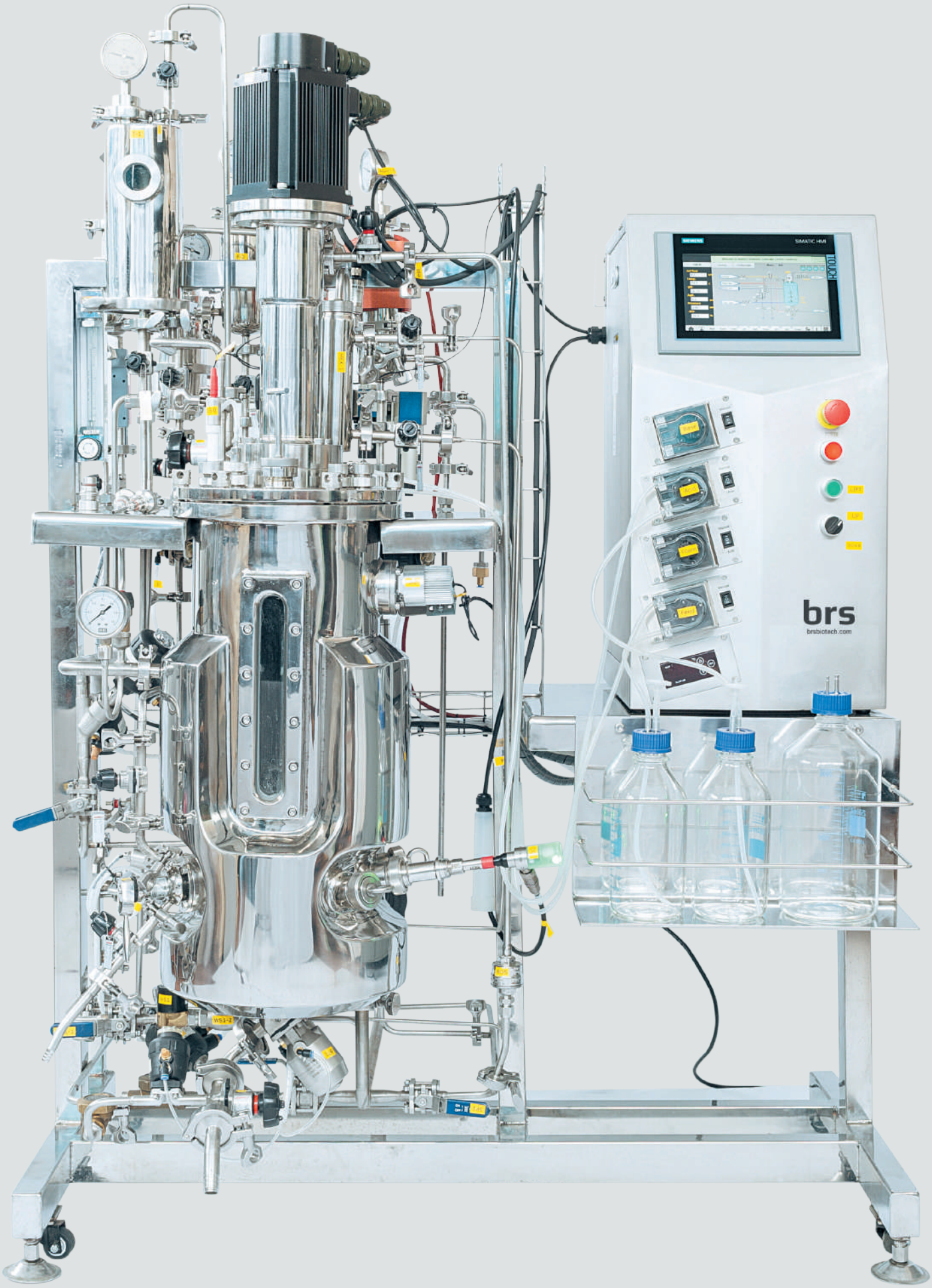
- Volumes ranging from 1 to 20 l.
- Fermenter is table-mounted and easy in maintenance and operation. Accessible connections for water and air minimize time and work requirements while starting operation.
- Power source, measurement and control tools are in separate cabinet and detached from fermenter. Each measurement and control circuit have individual module, which gives easy access for maintenance and a possibility for customization.

APPLICATION

- Batch and continuous cultivation of bacteria, fungi and yeasts.
- Plant and animal cells cultivation.
- Small-scale production of proteins and mAb.
- Process design and other applications for research centers.

SPECIFICATION

fermenter with autoclavable glass vessel and magnetic or mechanical drive									
material	Borosilicate glass + 316L steel								
agitation	Direct top drive or bottom magnetic clutch								
sterilization	Autoclavable								
volume, l	1	2	3	4	5	7	10	15	20
basic	Measurement and control functions: temperature, agitation speed, pH, DO, medium flow, antifoam/level, air flow (manual), pressure (manual)								
advanced	Multi-channel feed system + second pump for basic model. Vessel weighting system. Pressure, optical density, cell suspension concentration monitoring, methanol, ethanol, redox sensors. Exhaust analysis.								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STERILIZABLE-IN-PLACE PILOT FERMENTERS AND BIOREACTORS

BRS pilot fermenters and bioreactors act as a connection between laboratory and plant. An ideal solution for scaling in microbiological synthesis processes and small-scale production.

FEATURES

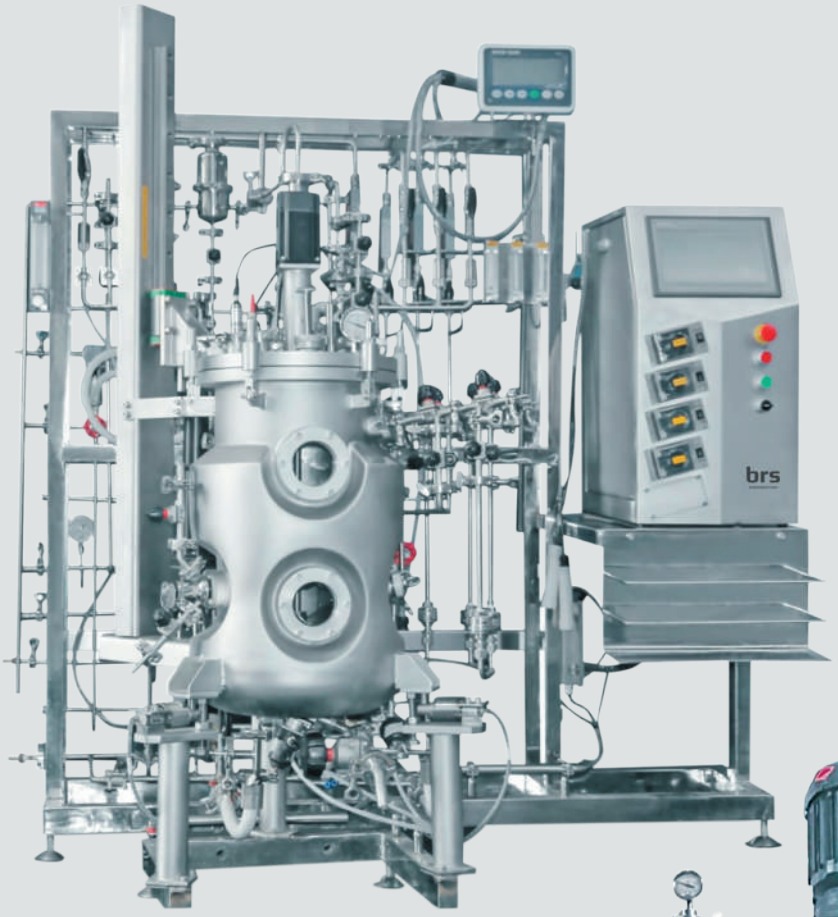
- Volumes ranging from 5 to 80 l.
- Fermenter is platform-mounted. Open frame modular construction gives easy access for maintenance and operation. Central connections for steam, water and air minimize time and work requirements while starting operation.
- Power source, measurement and control tools are in separate cabinet and detached from fermenter. Each measurement and control circuit have individual module, which gives easy access for maintenance and a possibility for customization.

APPLICATION

- Small-scale pilot production of agricultural and veterinary chemicals.
- Pharmaceutical production according to GMP and FDA standards.
- Pilot production with different biotech processes – with enzymes, bacteria, fungi, algae, animal and plant cells.
- Pilot production of proteins and mAbs.
- Scale-up studies, medium and process optimization for research centers.

SPECIFICATION

model	BRS-5/7/10SJ	BRS-30SJ	BRS-50SJ	BRS-80SJ
total volume, l	5/7/10	30	50	80
working volume, l	4/5/8	21	40	56
material	316L Stainless Steel			
agitation	Single, double-sealed or magnetic bearing			
basic	Measurement and control functions: temperature, agitation speed, pH, DO, medium flow, antifoam/level, air flow (manual), pressure (manual).			
advanced	MassFlowControl – automatic air flow meter, double-sealed or magnetic bearing, air outlet filter heating (anti-soaking), optical density sensor, cell suspension concentration monitoring sensor, methanol sensor, ethanol sensor, redox sensor, exhaust analysis. SIP ports for medium inlet system (acid, antifoam, alkali, substratum). SCADA advance – advanced remote control system.			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STERILIZABLE-IN-PLACE INDUSTRIAL FERMENTERS AND BIOREACTORS

BRS industrial-scale fermenters and bioreactors are designed for pilot and industrial processes and industrial upscaling. We offer stand-alone units as well as fully equipped lines for biotech and pharmaceutical plants.

All equipment designed according to GMP and FDA standards.

FEATURES

- Available volumes: 100/150/200/300/450/750/1000 l and more up to 60 000 l.
- Fermenter is platform-mounted Open frame construction gives easy access for maintenance and operation. Central connections for steam, water and air minimize time and work requirements while starting operation..

APPLICATION

- Stand-alone fermenters and fermentation lines for bacteria, yeast and fungi cultivation, used in biotech, pharma and food industries.
- Bioreactors and lines for animal cells cultivation used for proteins and mAb production.
- Solid-phase fermenters.
- Photobioreactors.

SPECIFICATION

model	BRS-100/150/200SJ	BRS-250/300/500SJ	BRS- 1000SJ	BRS-3000SJ
total volume, l	100/150/200	250/300/500	1000	3000
working volume, l	70/120/160	200/210/400	700	2100
material	316L Stainless Steel			
agitation	Single, double-sealed or magnetic bearing			
basic	Control functions: temperature, agitation speed, pH, DO, medium flow, antifoam/level, air flow (manual), pressure (manual).			
advanced	MassFlowControl – automatic air flow meter, double-sealed or magnetic bearing, air outlet filter heating (anti-soaking), optical density sensor, cell suspension concentration monitoring sensor, methanol sensor, ethanol sensor, redox sensor, gas analyzer. SIP ports for medium inlet system (acid, antifoam, alkali, substratum). SCADA advance – advanced remote control system.			

LAB AND PILOT ROCKER BIOREACTORS

BRS rocking bioreactor systems with single-use bags are designed for process development and seed train application.

BRS rocking bioreactor system is a reliable and intuitive cell culture system for working volumes up to 200 L. The system is based on a well-known rocking technology that provides mixing and aeration to the culture, which is maintained in an inflated, disposable bioreactor cultivation chamber. Also it can control the rocker speed, tilt angle, gas flow, temperature, pH, DO, concentration of CO2, O2 and weight.

FEATURES

- Suspension culture and adherent culture. Suitable for different cell culture bags, e.g, suspension cell culture and adherent cell culture. Continuous perfusion culture for adherent cell is achieved easily with our patented fabric carrier bag.
- Batch culture and perfusion culture of suspension cells. Perfusion membrane cell culture bag is used for the perfusion culture and high-density culture of suspension cells and the N-1 scale up.
- Adherent cell trypsinization, transfer and scale up.

APPLICATION

BRS bioreactors are design for a variety of cell cultures and applications:

- Mammalian cells, insect cells, viruses, gene therapy, and cell therapy.
- Cell inoculums preparation (for suspended and adherent cells).
- Manufacturing of antiviral vaccines for humans, as well as veterinary vaccines.
- Cell cultures for gene and cell therapy.
- Viral inoculum and viral vectors manufacturing.

SPECIFICATION

Tray size	10L			20L	50L	200 L	
Total volume	2L	5L	10L	20L	50L	100L	200L
Max. working volume	1L	2.5L	5L	10L	25L	50L	100L
Control system	Siemens PLC, 15-inch color touch screen, Enthernet interface, USB interface						
Temperature control	Heating plate, PID automatic control, accuracy: ±0.2˚C; Temperature control range: 5-40˚C above						
Rocker speed	1-40 rpm					1-25 rpm	
Tilt angle	1-12˚					1-10˚	
Gas	3 Thermal mass flow controllers (Air/O2/CO2), a thermal mass flow controller with 3 gas mexer optional						
Exhaust	Exhaust condenser, exhaust filter heater optional						
Exhaust analysis	O2 (0-50%), CO2 (0-15%)						
Pressure detection	Range: -100 mbar --- 100 mbar; Stop air intake when it is exceeded						
pH	Single-use pH probe, control range: 6-8, accuracy: ±0.05 pH; PID control; cascaded by gas flow, peristaltic pump, etc.						
DO	Single-use DO probe, control range: 0-100%, accuracy: ±3%; PID control; cascaded by rocker speed, MFC, etc.						
Pumps	4 fixed-speed peristaltic pumps, customized feeding / acid feeding / alkali feeding / discharging etc. 25 RPM or 100RPM variable speed optional						
Load cell	Load: 0-50 kg, accuracy: ± (0.050 + 1% loading sampling) kg; cascaded by pumps					Load: 0-200 kg, accuracy: ± (0.050 + 1% loading sampling) kg; cascaded by pumps	
Utilities	Air / O2 / CO2, pressure 15-20 PSIG						
Signal interface	Optional						
Power supply	AC220V, 50/60 Hz, 10A						

SINGLE-USE STIRRED TANK BIOREACTORS

BRS bioreactor product line offers the benefits of single-use technology and stirred-tank design in a modular, turnkey, bioreactor platform. Designed for scalability and robustness, the BRS bioreactor systems provide the performance and flexibility needed from process development to large-scale biopharmaceutical manufacturing.

BRS single-use bioreactor systems can be operated in batch, fed-batch, and perfusion modes.

BRS single-use stirred bioreactor composed of a stainless steel container, a single-use cell cultre bag and a controller equipped with excellent sensors.BRS bioreactor can match the bags volume from 50L to 2000L, and is easy achieve suspension cell culture and micro-carrier/fabric carrier adherent cell culture.

FEATURES

- Sterility/enclosed/low cost. Enclosed environment with low contamination risks and less maintenance.
- Convenient validation and operation. No need for cleaning and sterility validation with low contamination risks.
- Customization. Modular design enables configurability and provides added flexibility.
- Scale-up. Predictable and seam less process scalability. 50L to 2000L available.
- Monitoring. Monitoring cell culture process.

APPLICATION

BRS bioreactors are design for a variety of cell cultures and applications:

- Culture of mammalian cells/insect/stem cell
- Adherent cell culture on micro-carriers or fabric carriers
- Manufacturing of vaccines, recombinant proteins and antibodies
- Medium and low density microbal cell culture
- Large-scale seed culture

SPECIFICATION

Tray size	10L			20L	50L	200 L	
Total volume	2L	5L	10L	20L	50L	100L	200L
Max. working volume	1L	2.5L	5L	10L	25L	50L	100L
Control system	Siemens PLC, 15-inch color touch screen, Enthernet interface, USB interface						
Temperature control	Heating plate, PID automatic control, accuracy: ±0.2˚C; Temperature control range: 5-40˚C above						
Rocker speed	1-40 rpm					1-25 rpm	
Tilt angle	1-12˚					1-10˚	
Gas	3 Thermal mass flow controllers (Air/O2/CO2), a thermal mass flow controller with 3 gas mexer optional						
Exhaust	Exhaust condenser, exhaust filter heater optional						
Exhaust analysis	O2 (0-50%), CO2 (0-15%)						
Pressure detection	Range: -100 mbar --- 100 mbar; Stop air intake when it is exceeded						
pH	Single-use pH probe, control range: 6-8, accuracy: ±0.05 pH; PID control; cascaded by gas flow, peristaltic pump, etc.						
DO	Single-use DO probe, control range: 0-100%, accuracy: ±3%; PID control; cascaded by rocker speed, MFC, etc.						
Pumps	4 fixed-speed peristaltic pumps, customized feeding / acid feeding / alkali feeding / discharging etc. 25 RPM or 100RPM variable speed optional						
Load cell	Load: 0-50 kg, accuracy: ± (0.050 + 1% loading sampling) kg; cascaded by pumps					Load: 0-200 kg, accuracy: ± (0.050 + 1% loading sampling) kg; cascaded by pumps	
Utilities	Air / O2 / CO2, pressure 15-20 PSIG						
Signal interface	Optional						
Power supply	AC220V, 50/60 Hz, 10A						

SINGLE-USE MIXING SYSTEMS

BRS mixers are designed for convenient and efficient mixing of buffer, media, intermediates and product, as well as other process fluids. The single-use system eliminates the hassle of time-consuming and costly clean-in-place (CIP) and steam-in-place (SIP) procedures, as well as cleaning validation.

BRS single-use mixing system is a stable and high efficient system with stainless steel liquid container to meet requirements of liquid-liquid/solid-liquid mixing etc.

BRS single-use mixing system composed of master controller, universal magnetic drive unit, single-use bag with magnetic impeller, and a stainless steel container.

FEATURES

- Piping skid and container manufactured by SS 304
- The magnetic impeller in bag driven by coupling motor without seal
- Siemens PLC control, color LCD touch screen, control stability and easy to operate
- Modular design and configuration with temperature/load cell/pH/ DO/conductivity, etc.
- 3 level security, audit trail, batch report, electronic signature, and GMP standards.

APPLICATION

- Media mixing and preparation
- Mixing of vaccine adjuvant
- Mixing of intermediate product in purification process with pH and conductivity control
- Ultrafiltration and semi-finished product preparation
- Dilution of concentrated buffer

SPECIFICATION

Volume	50L	100L	200L	500L	1000L	2500L
Design	DISCHARGE FROM BOTTOM, SAMPLING PORTS/ADDITION PORTS AND PROBE PORTS IN THE SIDE					
Material	SS304					
Surface polished	Ra<0.6 μm					
Trundle	Large castor and polyurethane material					
Control System	Siemens color touch screen, Ethernet interface, USB interface, Human-machine interface, and save data					
Agitator	Magnetic drive.Max. speed: 300rpm					
Impeller*	Single-use magnetic impeller, impeller type optional. Impeller material is PP					
Agitating bag*	Standard bags or customized according to container size and volume					
Container Type*	Round and square					
Load cell*	Optional					
pH*	Optional					
Conductivity*	Optional					
Temperature*	Optional					
DO	Optional					
Jacket design*	Optional, for low-temperature mixing					
Software design*	Optional. 3 level security, audit trail, batch report, electronic signature, and GMP standards					
Needle printer*	Optional					
Operating temperature	No more than 45 °C					

* Optional

POWER
RUN
STOP
SIEMENS
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HIGH-SPEED TUBULAR CENTRIFUGES

BRS high-speed tubular centrifuges are designed for applications where a continuous process of separation is required, be it liquids and solids separation, extraction, concentration and clarification of substances with high viscosity, separation of solids with small volume fractions, caustic substances and other fields of application.

FEATURES

- Affordable and reliable.
- European-made components.
- Control box with Siemens transmitter.
- GMP compliant design and documentation.

APPLICATION

- Biopharmaceutics, for liquids clarification and bacteria extraction.
- Blood processing, manufacturing of plant extracts, food and beverages industry.
- Chemical industry.
- Separation of liquids, liquid and solid fractions.

SPECIFICATION

model	nominal capacity, (l)	rotation speed (rpm)	RCF (G-value)	through MAX. (l/h)
GQ145B	11	14000	15900	2000
GQ125B	8	15000	15720	1500
GQ105B	6	16000	15050	1200
GF105B	6	16000	15050	1200
GQ105BF	6	16000	15050	1200
GQ75B	2	20000	16700	200

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AUTOMATED ULTRAFILTRATION SYSTEMS

BRS TFF membrane filtration systems are well suited for laboratory and production scale applications to support rapid expansion from experimental level to production. According to different process requirements, BRS automated ultrafiltration systems can be configured with flow meter, temperature monitor, conductivity monitor, pH monitor and UV monitor.

BRS TFF ultrafiltration systems can be operated in a variety of advanced mode, such as constant TMP, constant flow rate, constant pressure etc.

FEATURES

- Full automatic control, user friendly interface and easy to operate. Operating parameters real-time display, TMP automatic calculation.
- Flexible configuration is available. Compatible with different hollow fiber and cassette holder.
- Sanitary design complies with ASME BPE, GMP standards. Provide FAT/SAT/IQ/OQ documentation and service support.

APPLICATION

INT TFF membrane filtration system is used for crude separation and purification of:

- Monoclonal antibodies
- Vaccines
- Plasma
- Therapeutic proteins

SPECIFICATION

Pump type	Low shear rotary pump
Membrane type	Cassette/ Hollow fiber
Max. operating pressure	4 bar
Connectors	Tri Clamp
Power supply	1Ph 220VAC/50Hz | 3Ph 380VAC/50Hz

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CHROMATOGRAPHY SYSTEMS

BRS process chromatograph is an automated system for large-scale biopharmaceutical manufacturing.

FEATURES

- Sanitary design, comply with GMP requirements.
- Software workstation controlled by PLC+PC.
- Automatic control by software,;simple interface, easy to operate;comply with FDA CFR Part 11.
- Monitor connected by optical fibre ,steady and reliable operating.
- System tubing are all standard in 316L SS, no dead corner, easy to clean.
- All core components are from internationally well-known suppliers.
- Provide with IQ/QQ support files and service.
- Customized systems are also available: more flexible and efficient ,can meet different scale production requirements.

APPLICATION

BRS low pressure chromatograph is an automated liquid chromatography system built for process scale-up and large-scale biopharmaceuticals purification:

- Monoclonal antibodies.
- Proteins.
- Enzymes.
- Other biopharmaceuticals.

SPECIFICATION

System Pump	Four-headed diaphragm pump		
Pump Head Material	316L SS/EPDM		
Tubing Size	3/8»OD(7.7mmID) 1/2» OD(9.4mm ID) 3/4» 00(22.1 mm ID)		
Flow Rate Range	4-180Uh	6-800Uh	12-1200Uh
Tubing Material	316L Stainless Steel		
Operating Pressure	≤6bar		
Operating Temperature	4°C-40°C		
UV Monitor	200-400nm, 2048 CCD Array detector. Monitor up to 4 wavelength at the same time		
Collection Mode	Deliver fixed volume and peak sample collection		
Cond Monitor	1 μS/cm-500mS/cm		
pH Monitor	0-14		
Power Supply	AC110-380V 50/60Hz		
Control Mode	WindowsXP/Win7 32 bit +PC Software, PLC+PC		
Enclosure Protective Class	NEMA 4X/IP 65		
Dimensions	1120mmx650mmx1140mm(UW/H)		

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PROCESS CHROMATOGRAPHY COLUMNS

BRS automated chromatography columns are specially designed for the purification of biopharmaceuticals.

FEATURES

- Electrically operated axial compression columns.
- Designed for simple and easy operation with ECPS (Electrical Column Packing Station) .
- All selected materials comply with the standard of ASME and GMP requirements.
- Electrical adaptor design allow full scale compression.
- 5 different diameter options to fulfill different process requirements.
- Acrylic tube from well-known supplier : Blanson UK.

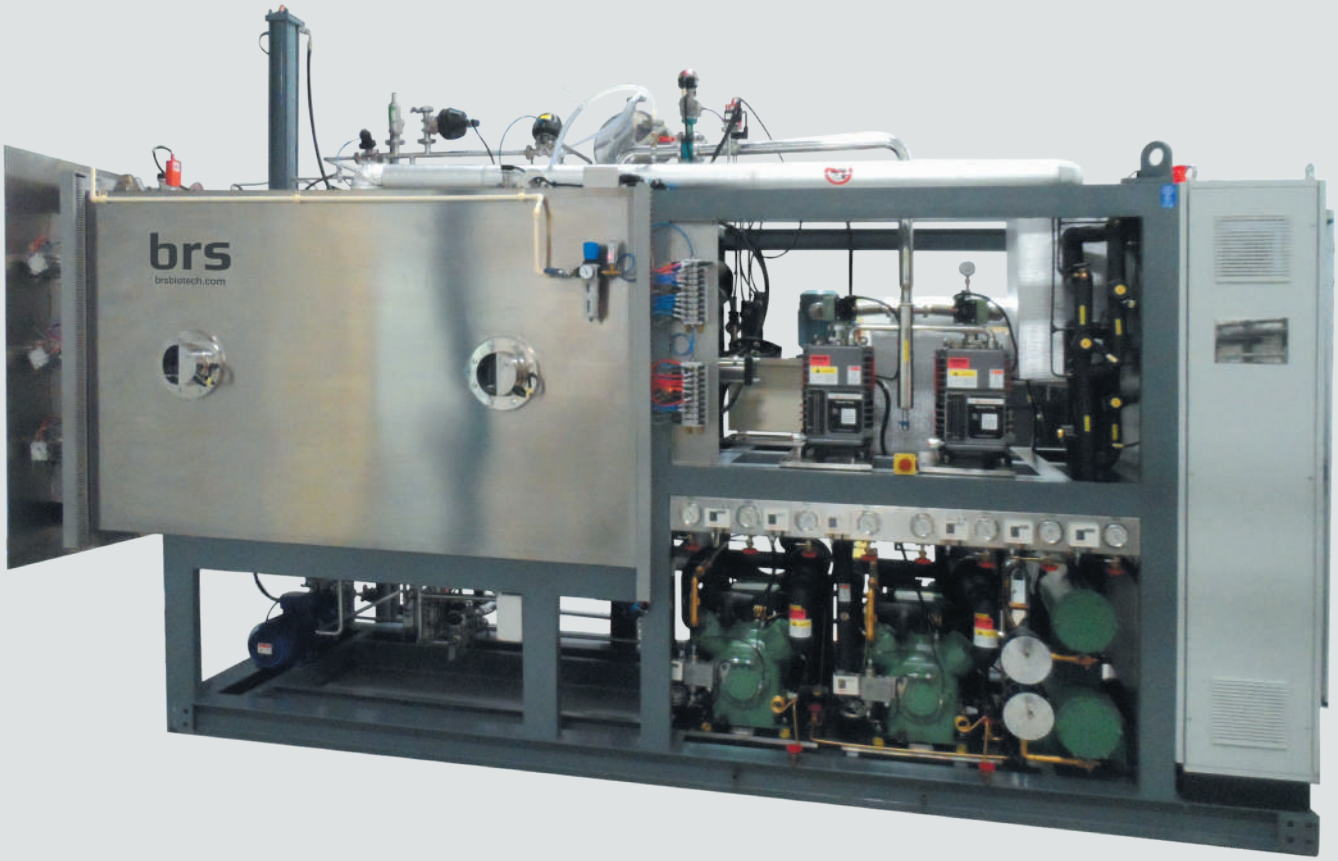
APPLICATION

- Monoclonal antibodies and proteins purification.

- Large-scale human vaccine purification
.

SPECIFICATION

ID, mm	Column height, mm	Bed height, mm	Effective column volume, l
300	700	10-570	0.7-40.3
300	900	10-770	0.7-54.4
400	700	10-570	1.2-71.6
400	900	10-770	1.2-96.7
400	1100	10-970	1.2-121.8
450	700	10-570	1.6-90.6
450	900	10-770	1.6-122.4
450	1100	10-970	1.6-154.2
600	700	10-570	2.8-161.1
600	900	10-770	2.8-217.6
600	1100	10-970	2.8-274.1
800	700	10-570	5-286.4
800	900	10-770	5-386.8
1000	700	10-570	7.9-447.5
1200	700	10-560	11.3-633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FREEZE DRYERS

BRS LYOPRO series Freeze Dryers, have been engineered and are manufactured to comply with the stringent requirements of the Pharmaceutical industry.

The industrial model freeze dryer with drying capacity up to 1,000 liters, cover mostdemand for vial or other material commercial production, compliance with cGMP and FDA.

FEATURES

- Automatic control for freeze drying, SIP and CIP, shelf stoppering.
- Scada control system compliance with GAMP.
- Environment friendly refrigerant.
- Flexible arrangement design, suit user's plant layout, thus space saved.

APPLICATION

- Biotechnology
- Medicine
- Pharmaceutical industry
- Diagnostic and nutrient markets
- Parenteral and veterinary pharmaceuticals

SPECIFICATION

model	LYO-3.0	LYO-5.0	LYO-7.5	LYO-10.0	LYO-13.0	LYO-16.0	LYO-20.0	LYO-25.0	LYO-30.0	LYO-40.0	LYO-50.0
drying capacity, l	60	100	150	200	260	320	400	500	600	800	1000
shelf S, m^2	3.24	5.40	7.56	9.72	12.96	15.84	19.80	24.75	30.00	42.00	49.50
shelf size L*W, m	0.9 0.6	1.2 0.9	1.2 0.9	1.2 0.9	1.2 1.2	1.2 1.2	1.5 1.2	1.5 1.5	2.0 1.5	2.0 1.5	2.2 1.5
shelf N°	6	5	7	9	9	11	11	11	10	14	15
shelf min t °C	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55	-55
condenser min t °C	-75	-75	-75	-75	-75	-75	-75	-75	-75	-75	-75
vacuum, min, Pa	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0
power, kW	28.0	40.0	52	63.0	77.5	91.5	120.0	135.0	147.0	179.0	180.0

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警告/WARNING
非专业人员
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NON PROFESSIONALS
DO NOT OPEN

SPRAY DRYERS lab & industrial

Laboratory spray dryers are self-contained and come complete, ready for use immediately after installation.

We offer **several models of laboratory spray dryers** for organic and aqueous solvents. Models can work in automatic or semi-automatic modes. We also offer **industrial spray dryers of various capacities** with evaporation volumes of 5, 25, 50, 10, 150, 200-2000 liters per hour.

FEATURES

- Fully operational unit with integrated oil-free compressor.
- Color display controller.
- PID controller is used to set the exact t °C
- Ability to work in automatic and «manual» modes.
- Spray chamber, cyclone made of stainless steel (option).
- All parts of the system are easy to remove and wash.

APPLICATION

- **Chemical industry:**
  alkaline dyes and pigments, silicic acid, catalysts, sulfuric acid agents, amino acids.
- **Food industry:**
  skimmed milk powder, protein, cocoa milk powder, egg protein (yolk), chicken stock, instant coffee, peanut protein, hydrolysis products, sugar, corn syrup, corn starch, glucose, pectin, malt sugar, potassium sorbate.
- **Ceramics:**
  aluminum oxide, ceramic tile material, magnesium oxide, talc.

SPECIFICATION laboratory models

model	015	018	8005
capacity (by water)	1,5 l/h	3, 5 l/h	5,0 l/h
maximum inlet temperature	250 °C	30 – 350 °C	140 ~ 350 °C
spray system	two-line nozzle	two-line nozzle	rotating disk
spray nozzle / disc diameter	0.5/0.7/0.75/1.0/1.5/2.0 mm		50 mm
material of spray chamber, cyclone, product flask	borosilicate glass	SUS-304	SUS-304
power	3, 5 kW	5 kW	9 kW
dimensions	750*650*1200 mm	1060*1000*1830 mm	2000*1500*2700 mm

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CLEAN-IN-PLACE SYSTEMS

BRS CIP systems are designed for effective cleaning of installation after processes or between batches, working on several production lines while reducing chemicals and utilities costs.

FEATURES

- Affordable and reliable.
- European-made components.
- Easy maintenance and operation.
- Swift and simple installation.

APPLICATION

- Fermenters, vessels and piping cleaning.
- Vessels preparation for product change.

SPECIFICATION

vessel volume	150-600 l (single-tank or two-tank)
vessel material	SUS316l
voltage	3×400 VAC, 60 Hz
water working pressure	Up to 3 bar
solution flow	10-25 m^3/h
max temperature	85 ^0C
circuits	Single-pass or multi-circuit
control	Automatic control: temperature, time, cycle, automatic solution return
optional	GMP documentation

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BIOLOGICAL SAFETY STEAM STERILIZER

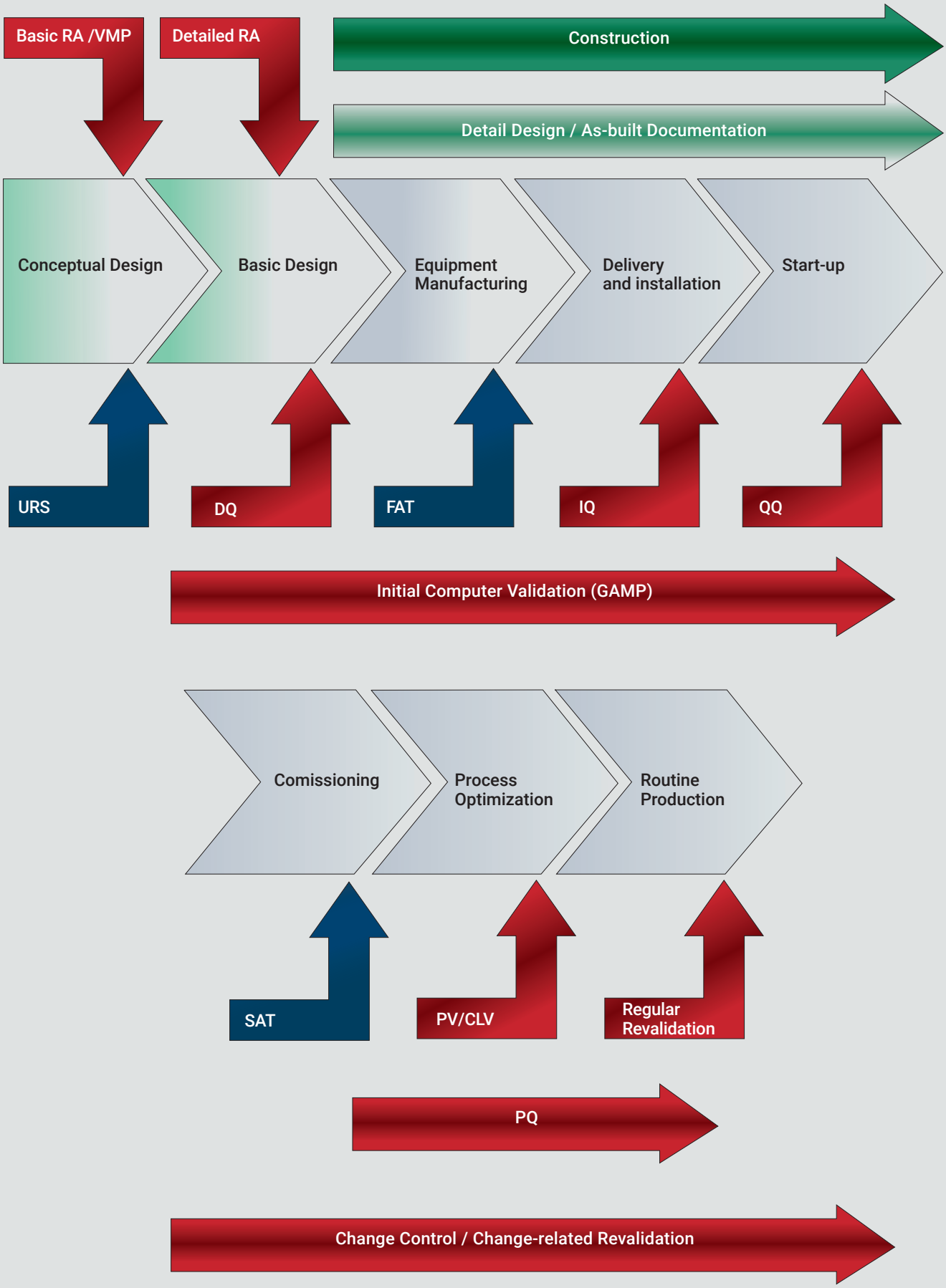
BRS biological safety autoclave is mainly used for the high temperature sterilization for the toxic substances in P3 laboratory and biological pharmaceutical industry.

FEATURES

- Stand-alone, pass-through or built-in versions.
- Uniform temperature distribution in the chamber.
- Different option for air removal from the chamber.
- Equipment has varieties of loading and sterilization programs for users to choose for sterilizing items in different properties.
- Equipment is accessorized with standard GMP verification interface.
- The sterilization process can be traced back, with independent data recording device and industrial control system to ensure data accuracy.

SPECIFICATION

Model	Camera volume, m3	Camera dimensions, m	External dimensions, m	Steam, kg	Water consumption, kg	Power supply. kW	Weight, kg
0.25	0.25	8x6x6	1.1x1.32x1.7	15	40	3	850
0.36	0.36	1x6x6	1.3x1.32x1.7	20	45	3	900
0.6	0.6	1.2x6.1x9.1	1.5x1.32x1.95	30	50	3	1370
0.8	0.8	1.5x6.1x9.1	1.8x1.32x1.95	40	60	4	1400
1.2	1.2	1.5x6.8x1.18	1.82x1.42x2	40	60	4	1800
1.5	1.5	1.9x6.8x1.18	2.2x1.42x2	50	70	4	2000
2.0	2.0	2.5x6.8x1.18	2.8x1.42x2	65	80	4.5	2250
2.5	2.5	2.1x1x1.2	2.4x1.88x2	80	80	4.5	2700


Basic RA /VMP
Detailed RA
Construction
Detail Design / As-built Documentation
Conceptual Design
Basic Design
Equipment Manufacturing
Delivery and installation
Start-up
URS
DQ
FAT
IQ
QQ
Initial Computer Validation (GAMP)
Comissioning
Process Optimization
Routine Production
SAT
PV/CLV
Regular Revalidation
PQ
Change Control / Change-related Revalidation

GMP AND VALIDATION

Design and manufacturing is carried out in accordance with FDA and GMP standards.

DOCUMENTATION

The full documentation includes: FAT, IQ, OQ, DQ, Manual and maintenance, Cad layout drawing, Main parts/spare parts list, SAT, Factory's certificate, PLC software operation copy.

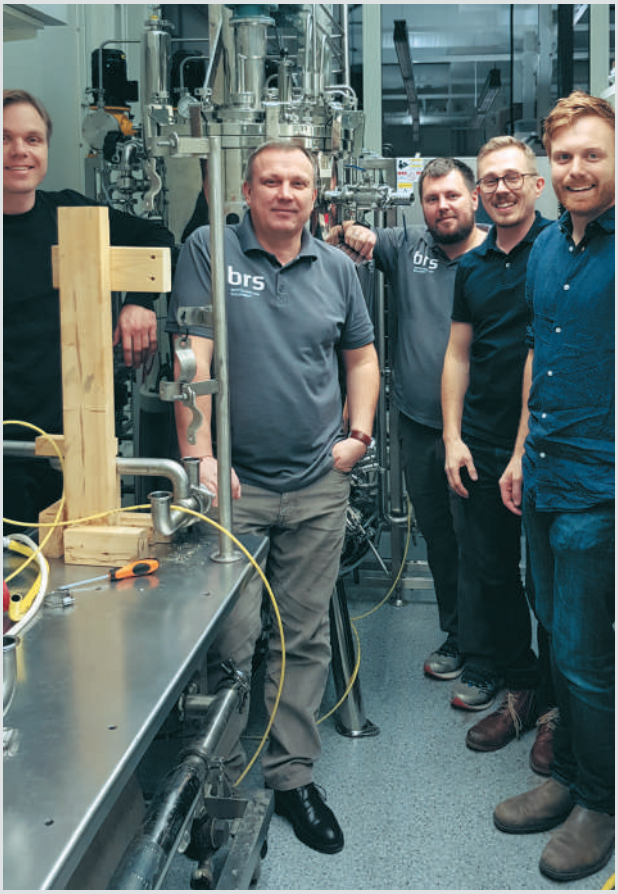
VALIDATION SERVICES

We can also implement a full range of validation services according to the scheme:

CLV - Cleaning Validation
DQ - Design Qualification
FAT - Factory Acceptance Test (Equipment Manufacturers Site)
GAMP - Good Automated Manufacturing Practice (ISPE Baseline Guide, GAMP 5: A Risk-Based Approach to Compliant GxP Computerized Systems)
IQ - Installation Qualification
OQ - Operational Qualification
PQ - Performance Qualification
PV - Process Validation
RA – GMP Risk Analysis
SAT - Site Acceptance Test (Clients Site)
URS - User Requirements Specification
VMP - Validation Master Plan

OUR PROJECTS

Bioreactors for probiotics manufacturing. 15-150l. San-Diego, USA



300 l bioreactor, Ecohelix (Stockholm, Sweden)

We propose stand-alone units as well as fully equipped lines for biotech and pharmaceutical plants.

Bioreactor for cell culture 100 l, with OD detection (Egypt).

fermenter 50 l

fermenter 1500 l

freeze dryer – 3,0 m²

spray dryer –3 l/h

High-speed tubular centrifuge (Belgium)

brs
BIOTECHNOLOGY
EQUIPMENT

Fermentors& Bioreactors/Downstream Processing Equipment
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