

Our products

Shakers | Bioreactors | Bioprocess Software





We have extensive knowledge of bioprocess technology. And we like to share it.



With 8 affiliates and 52 distributors worldwide, we are nearby. For a truly personal consultation.



Our service and technical support are first-rate. This means you're on the safe side.



Brochures, application notes and much more are available to you.
Help yourself!

www.infors-HT.com

Incubation shakers, bioreactors and software for reliable and efficient cultivations, from planning to success

INFORS HT is your specialist for bioreactors, incubation shaker and bioprocess software. You benefit from sophisticated systems that contribute to your success by maximizing the productivity of your cell lines or microorganisms without sacrificing reproducibility.

An eye towards solutions and personal, sustainable customer relationships are our greatest strengths. Come find out for yourself!

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More information is available at www.infors-HT.com



Multitron

Unrivaled in size and flexibility.

The Multitron is the number-one choice for reliable, convenient cultivation of microorganisms and cell cultures. The incubation shaker guarantees homogeneous conditions and delivers reproducible results, leaving nothing to be desired regarding its features and capacity.

- A real marvel when it comes to capacity: cultivate up to 63 liters or 23 000 batches in parallel in less than a square meter of space
- High degree of temperature uniformity and precision
- Allows you to pursue all manner of applications, from standard experiments to complex cultivations
- Optimized hygienic design

"The Multitron has greatly increased the production capacity of our small lab space. I've relied on these shakers for years and couldn't be happier."

Nicole Lapuyade-Baker, Senior Research Associate CytomX Therapeutics

More information is available at www.infors-ht.com

Multitron

Sample configurations

Microorganisms

Maximum oxygen introduction, even when filled to maximum capacity in stacked units.

- 25 or 50 mm shaking throw for optimal mixing from tubes to 5 L shake flasks
- High shaking frequencies for maximum oxygen transfer

Cell culture

Optimum conditions for mammalian and insect cells.

- Active CO₂ control
- Hygienic, condensate-free humidity control designed to limit evaporation loss
- Housing with antimicrobial coating as an option
- Optimized for gentle mixing and good oxygen transfer

Screening in 96-well plates

Conduct over 7,000 experiments in parallel.

- Perfect conditions thanks to 3 mm shaking throw and 1000 min⁻¹
- Hygienic, condensate-free humidity control designed to limit evaporation loss
- Technology proven to increase yields over traditional methods
- Active CO₂ control

Phototrophic organisms

Sunlight in the shaker; excellent uniformity.

- Energy-saving, warm-white LED lighting
- Light intensity up to 240 µmol m⁻²s⁻¹
- Even distribution of light across the tray
- Day-night-cycle simulation or selective induction – easy to do with eve®



Multitron Standard

Ready, set, shake.

Ideally equipped for basic microbial applications

- Preconfigured standard system in three variations with optimal price-performance ratio and short delivery times
- Multiple applications can be run at the same time

"I've worked with the Multitron Standard in the laboratory for 8 years. My conclusion: nearly maintenance-free, reliable temperature and agitation control and extremely flexible loading."

Dipl. Ing. Biot. MSc (FH) Christian Meier, Managing Director Infors Latam

More information is available at www.infors-ht.com



Minitron

Small scale – big results.

An all-around genius in a small space. In terms of capacity, the Minitron is the Multitron's little sister. However it has the same variety of application possibilities for microbial, animal and plant cells.

- Space-saving: on the floor, table, or 2 units stacked on top of each other
- Low CO₂ consumption
- Safety and easy cleaning in the event of leaking liquid
- LED version for phototrophic organisms

"Even with a maximum load with a culture volume totaling 7.5 L, the Minitron's low-vibration, quiet operation is impressive."

Dr. Daniel Brücher,
Product Specialist Shakers INFORS HT

More information is available at www.infors-h.com

Minitron

Sample configurations

Microorganisms

Maximum oxygenation even with maximum load stacked in two units

- Shaking throw of either 25 or 50 mm for optimal mixing, achieving comparable results in a range of vessels from microtiter plates to 5 L shake flasks
- High shaking speeds of up to 400 min⁻¹ for the best possible oxygenation

Cell cultures

Optimal conditions for mammalian and insect cells

- Active CO₂ regulation
- Hygienic direct steam humidification limits evaporation effects
- Meticulously sealed housing ensures low CO₂ consumption

Phototrophe Organismen

Sunlight in the shaker with a high degree of uniformity

- Energy-saving, warm white LED lighting
- Light intensity up to 200 µmol m⁻² s⁻¹
- Even light distribution throughout the tray
- Simulation of day-night cycles or targeted induction – easy to perform with eve®



Ecotron

A starter model with refinement.

The Ecotron is the entry-level incubation shaker.

Designed for users who want quality and performance with an excellent price-performance ratio, the Ecotron does not skimp on durable materials and sophisticated design.

- Quiet, vibration-free operation
- Convenient loading through a front-opening folding door
- Space-saving: on the floor, table, or 2 units stacked on top of each other
- Safety in the event of leaking liquid

"The Ecotron shakers are reliable, versatile, space-saving and very well-priced."

Sandra Codlin, PhD, Lab Manager,
University College London (UCL), UK

More information is available at www.infors-h.com



Orbitron

A true workhorse.

The extremely stable, splash-proof Orbitron is suitable both for daily operations in the lab and for use in climate-controlled rooms.

- For demanding continuous operation
- Suitable for a variety of loading capacities
- Fast and easy tray exchange
- Easy to clean
- Loading capacity up to 31 kg

"The Orbitron has proven itself to be a reliable 'workhorse' for us which can handle large loads very well."

**Dr. sc. nat. Nicole Stichling,
Product Manager Shaker, INFORS HT**

More information is available at www.infors-ht.com



Celltron

Fine-tuned for your incubator.

For the best results in cell culture, every step counts – including the first one. The Celltron is a small shaker, specially developed for use in CO₂ incubators, which ensures an ideal start for the cell culture with minimal energy use and an antimicrobial coating.

- Gentle mixing of the cell culture
- Constant temperatures in the incubator through minimal heat emission
- Can be controlled outside of the incubator using the touch controller
- Long lifespan through corrosion-resistant materials

"We tested Celltron in detail and recommend it for use in our incubators."

**Heinz Bayer, Head of Technical Sales,
Memmert GmbH, Germany**

More information is available at www.infors-ht.com



SHAKERS ACCESSORIES

Cell Growth Quantifier (CGQ)

- Online measurement of biomass in shake flasks
- Non-invasive OD measurements ensure an undisturbed bioprocess run
- Time-saving production of precise, microbial growth curves as well as real-time analysis of important growth parameters
- Resource-optimised process development through screening under optimal culture conditions in up to 16 shake flasks simultaneously

**Liquid Injection System (LIS)**

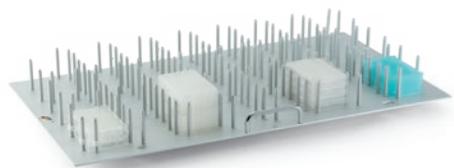
- Automated liquid feeding with programmable control unit
- Easy handling of single use cartridge, drive and software
- Suitable for a variety of substances such as sugar solutions, alcohols and suspensions
- Predefined or fully configurable feeding profiles

**Retaining clamps**

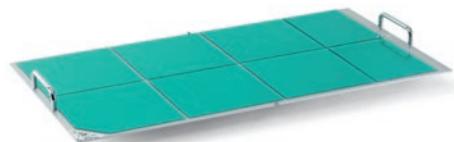
- Stainless steel retaining clamps can be screwed onto universal trays
- For Erlenmeyer and Fernbach flasks
- Special mounting hardware upon request

**Test tube holders**

- Perforated inserts made of foam rubber ensure a reliable hold and prevent rattling noises
- Test tubes can be incubated in a vertical position or at an adjustable angle
- Compatible with universal as well as on Sticky Stuff trays

**Trays**

- Corrosion-resistant, anodized aluminum
- Can be configured with a variety of flask clamps, adjustive tube racks or adhesive mats
- Autoclavable
- Specialty trays for 96-well plates

**Sticky Stuff adhesive matting**

- Compatible with all vessels with a smooth bottom
- Reliable fixation even with high agitation speeds and temperatures
- Long lifespan
- Easy cleaning and regeneration with water

More information is available at www.infors-HT.com

BIOREACTORS

**Minifors 2**

Unbeatable in its class.

The Minifors 2 is a compact and easy-to-use bioreactor with a full range of application possibilities. It is a complete package that enables both beginners and experienced users to easily perform bioprocesses.

- Complete package for the cultivation of microorganisms and cell cultures
- Delivered preconfigured and ready for use
- Compact, user-friendly design with a small footprint and few connections
- Easy operation in several languages via touch screen
- Can be used in stand-alone operation without a PC

"We are thoroughly impressed by the practical design. It allows us to save time during calibration and preparation for cultivation."

Mohd Razif Mamat,
Head Of Technical Administration &
Operation, Malaysia Genome Institute

More information is available at www.infors-HT.com



Labfors 5

High-end All-rounder.

A truly universal bioreactor: The Labfors 5 is suitable for cell cultures, microorganisms, phototrophic organisms as well as solid substrates and enzymatic bioprocesses. There are almost no limits to its uses.

- Configurations adapted to customer requirements
- Fully equipped with up to 13 ports, five MFCs and six pumps
- Up to four gasses can be used in almost every combination
- Control and monitor up to six units in parallel via touchscreen

"The Labfors bioreactors, with their modular philosophy, give us enormous flexibility."

Prof. Dr. Christoph Herwig,
Head of Biochemical Engineering,
Vienna Technical University

More information is available at www.infors-HT.com



Microorganisms

- Stirring system with a directly driven high-performance motor
- High oxygenation in high cell density cultivation

Option:

- LabCIP automatic cleaning (CIP) and sterilisation (SIP) of all parts in contact with the product
- Double throughput possible due to overnight cleaning
- Reliable, reproducible and validatable base and/or acid cleaning



Cell cultures

- Aseptic magnet stirring system
- Spin filter suitable for perfusion processes

Option:

- Mobius® CellReady 3L single-use bioreactor working volume from 0.9 L to 2.4 L
- Switch between glass and single-use culture vessel in just two steps



Phototrophic organisms

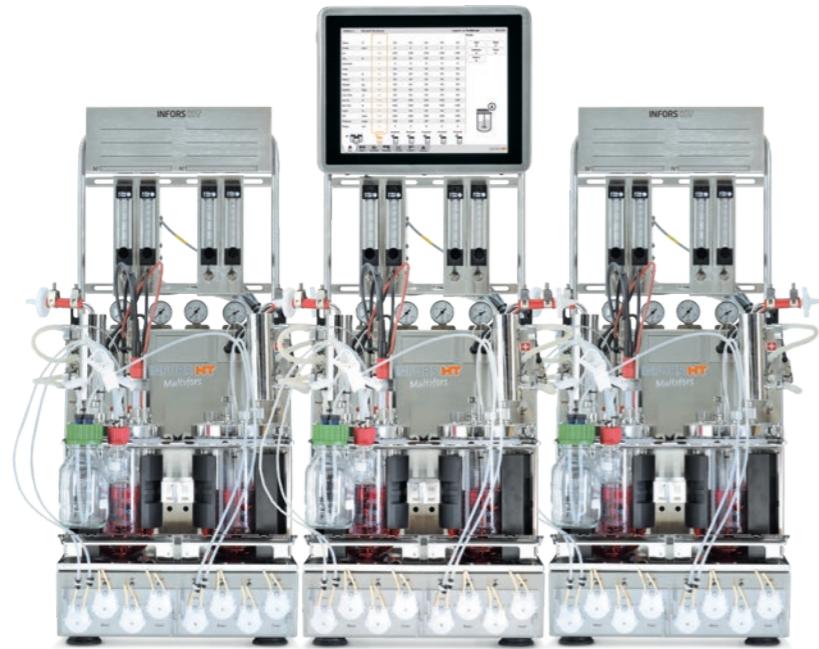
- 260 water-cooled high-power LEDs
- Maximum lighting intensity of approx. $3,000 \mu\text{mol m}^{-2}\text{s}^{-1}$
- Autoclavable flat-bed culture vessel for a controlled environment with evenly distributed lighting intensity
- Dimming 0.1–100 %
- Simulation of daylight curves (with eve®)
- CO_2 enrichment possible



Solid substrates and enzymatic bioprocesses

- For various kinds of enzymatic hydrolysis and fermentation
- Very powerful motor for best mixing even with very viscous substances, or with a high dry substance content in the starting material
- Easy addition of solids through the 40-mm port
- Accurate and safe temperature setting for sensitive media containing solids
- Optional display of the motor torque to analyse progress of the hydrolysis

More information is available at www.infors-HT.com



Multifors 2

Big technology on a small scale.

With Multifors 2 you can work with up to six bioprocesses in parallel.

Thanks to a selection of preconfigured packages and a variety of connection possibilities and options, you will be ideally equipped for optimizing sophisticated bioprocesses on a small scale.

- Fully functional bioreactors on a small scale
- Small vessels with multiple Pg13.5 ports
- Simple handling through a bottom drive and fast autoclaving of all bottles and pumps
- For microorganisms and cell cultures
- Same sensor technology as larger bioreactors for comparable scale-up

"The option to run up to six units from a simple control unit creates a small bench foot print and makes experimental design simple and efficient."

**Dr. Emma Allen-Vercoe, Associate Professor,
University of Guelph, Canada**

More information is available at www.infors-ht.com



Techfors-S

In situ made easy.

Your entry into the *in situ* world. Techfors-S brings you the benefits of this technology and yet is still as easy to operate as a bench-top bioreactor.

- For cells and microorganisms
- Mobile device with easy access to components on the back
- Low minimum working volume
- Cleaning-in-place (TechCIP) as an option
- *In situ* sterilisation, optionally with integrated steam generator

"The Techfors-S bioreactor systems have been a key component to our mammalian cells grown in continuous culture."

Eva Bric-Furlong, Automation Specialist and Scientific Research Investigator, Sanofi US

More information is available at www.infors-ht.com

BIOREACTORS



Techfors

As individual as your requirements.

There are practically no limits, since each pilot bioreactor model is built to your specifications. You set the requirements – we implement them based on our modular platform.

- Broad spectrum of total volumes from up to 1000 L
- Temperature control up to 79 °C
- Numerous options individually according to customer requirements, e.g.: stirrer speed, gassing strategy and number of ports, *in situ* sterilisation, semi- or fully automatic cleaning-in-place

"Techfors is the bioreactor for demanding professionals. It provides unrivalled flexibility for individual specifications coupled with simple operation via the touch screen."

Dr. Tony Allman,
Product Manager Fermentation INFORS HT

More information is available at www.infors-h.com

BIOREACTORS ACCESSORIES



CGQ BioR

- Non-invasive online biomass monitoring
- Sensor is attached to the vessel wall
- Real-time analysis without external sampling



Super-Safe Sampler

- Allows to take smallest aseptic samples without laminar flow
- Air backflushing
- No dead volume
- Needle-free
- Reusable



Gas Analyser

- CO₂ or O₂ analysis integrated in your bioreactor
- Calculation of parameters such as, e.g., the rate of Carbon evolution rate (CER), the oxygen uptake rate rate (OUR) and therefore the respiration quotient (RQ) with eve®



Perfusion, e.g. with spin filters

- Cell-free removal (harvest) of culture supernatants
- Available in different sizes and pore diameters



Online sensors for cell density and biomass

ASD12-N and ASD25-N absorption sensors **from Optek**

- Recording of the total cell density in the near-infrared range (NIR) at 840 to 910 nm
- Independent of color changes of the culture medium
- Space-saving: compact transmitter is built directly into the control device of the bioreactor

Alternatively, **InPro 8100 sensors from Mettler** for the determination of the overall cell density and the **Aber Futura System** for the determination of the live cell density can be used.

More information is available at www.infors-h.com



eve® – the Bioprocess Platform Software

Digitize your bioprocesses.

Able to do more than just plan, control and analyze your bioprocesses, eve® software integrates workflows, devices, bioprocess information and big data in a platform that lets you organize your projects in the cloud, no matter how complex they are.

- High-performance database technology (NoSQL)
- Integrates bioreactors, shakers, and analytical instruments, regardless of the manufacturer
- Integrates the entire workflow, from planning to data analysis
- Libraries for organizing bioprocess information
- Web-based – Data are available via a browser, independent of the operating system

"My staff and I are very enthusiastic by eve®. The handling is easy and logical, which makes it quick to learn."

**Prof. Dr.-Ing. Richard Biener,
Bioprocess Technology, Esslingen University
of Applied Sciences**

Choose your eve® package

	Basic	Standard	Premium
Monitoring			
Batch data acquisition and storage in a centralized database	✓	✓	✓
Advanced configurable charting	✓	✓	✓
Unlimited remote access via web browser	✓	✓	✓
Batch & system alarm with visual alarm, dynamic and fixed ranges and e-mail batch alarm	✓	✓	✓
Calculated values with soft-sensor	✓	✓	✓
Data libraries for batches, recipes, organisms, culture media and compounds	✓	✓	✓
Multi-user access	✓	✓	✓
Sample data management	✓	✓	✓
Control			
Setpoint remote control	–	✓	✓
Batch control strategy with			
– Phase system incl. configurable transition conditions	✓	✓	✓
– Preconfigured function (linear, exponential steps)	–	✓	✓
– Gravimetric feeding (exponential, polynomial, profile)	–	✓	✓
– Scripting capabilities	–	✓	✓
Reporting			
Batch report including meta data, parameter, parameter chart, recipe, audit trail, export in PDF or MS Office	✓	✓	✓
Audit trail reporting with selection of time frame, user or event filter, export in PDF or MS Office	✓	✓	✓
System			
Integrated backup/restore	✓	✓	✓
Interface with 3rd party software (REST API)	✓	✓	✓
Automatic restart after power failure	✓	✓	✓
Automatic logout (configurable)	–	–	✓
Automatic password expiration	–	–	✓
Lockout on failed logins	–	–	✓
High complexity passwords	–	–	✓
IP white list for batch control restriction	–	–	✓
Validation documents			
Functional specification (FS)	–	–	✓
Declaration of conformity (FDA CFR 21 Part 11)	–	–	✓
Declaration of conformity (EU GMP Annex 11)	–	–	✓
Installation qualification protocol (IQ)	–	–	✓
Operational qualification (OQ)	–	–	*
General			
Up to 100 supported process units	✓	✓	✓
Database management via NoSQL – ElasticSearch	✓	✓	✓
Supported server operating system Windows 10 pro, Windows 2016/2019 Server	✓	✓	✓
Service			
1 year free maintenance (free updates)	✓	✓	✓
Service & training	*	*	*
Validation service	–	–	*
Additional driver			
Modbus RTU/TCP	*	*	*
OPC	*	*	*
DCU (Sartorius)	*	*	*
ADI (Applikon)	*	*	*
Balances (Mettler, Ohaus, Kern, Sartorius)	*	*	*
Pumps (Ismatec, Watson Marlow)	*	*	*

* available as an option

Technical data – Shakers

Specifications subject to change

Bench-top shakers			Incubation shakers		
Celltron	Orbitron	Ecotron	Minitron	Multitron Standard	Multitron
Dimensions (W x D x H)	450 mm x 380 mm x 90 mm	640 mm x 600 mm x 150 mm	635 mm x 630 mm x 630 mm	800 mm x 623 mm x 700 mm	1070 mm x 880 mm x 550 mm
Number of batches	49	197	49	105	197
Volume	3 L	21 L	6 L	9 L	21 L
Maximum load	2.5 kg	31 kg	10 kg	12 kg	19 kg
Maximum expansion	n/a	n/a	Up to 2 units can be stacked	Up to 2 units can be stacked	Up to 3 units can be stacked
Rotation speed	20–200 min ⁻¹	20–550 min ⁻¹	20–550 min ⁻¹ depending on load and stacking	25–400 min ⁻¹ depending on load and stacking	20–400 min ⁻¹ depending on load and stacking
Shaking throw	25 mm	25 mm	25 mm	25 mm / 50 mm	25 mm / 50 mm
Temperature	4 °C to 60 °C	4 °C to 65 °C	5 °C above AT to 65 °C 10 °C below AT to 65 °C with cooling	5 °C above AT to 65 °C 16 °C below AT to 65 °C with cooling; Minimum temperature 4 °C	6 °C above AT to 65 °C 12 °C below AT to 65 °C (with top cooling) 13 °C below AT to 65 °C (with lateral cooling) Minimum temperature 4 °C
Standard parameters	Rotation speed, timer	Rotation speed, timer	Rotation speed and temperature	Rotation speed and temperature	Temperature, rotation speed, timer
Optional parameters	n/a	n/a	Cooling	Cooling, CO ₂ regulation, humidification, light intensity	Cooling
Ambient humidity (rH)	n/a	n/a	n/a	Up to 85 % non-condensing	Up to 85 % non-condensing
Power supply	110/230V ±10 %, 50–60 Hz	115/230 V ± 10 %, 50–60 Hz	115/230 V ± 10 %, 50/60 Hz	115/230 V ± 10 %, 50/60 Hz	115/230 V ± 10 %, 50/60 Hz

Technical data – Bioreactors

Specifications subject to change

Bench-top bioreactors						Pilot bioreactors
Minifors 2	Multifors 2	Labfors 5 cell cultures and microorganisms	Labfors 5 (phototrophic organisms)	Labfors 5 (Solid Substrates / Enzymatic Bioprocesses)	Techfors-S	Techfors
Vessels	1.5 L / 3 L / 6 L	0.4 L / 0.75 L / 1.4 L 0.4 L / 0.7 L / 1 L (cell version)	2 L / 3.6 L / 7.5 L / 10 L (cell version) / 13 L	1.9 L	3.9 L	15 L / 30 L / 42 L
Working volume	0.3–1.0 L / 0.6–2.0 L / 1.1–4.0 L	0.115–0.25 L / 0.18–0.5 L / 0.32–1 L 0.097–0.25 L / 0.15–0.5 L / 0.22–0.75 L (cell version)	0.5–1.2 L / 0.5–2.3 L / 1–5 L / 2.1–7 L / 2.2–10 L	1.6–1.8 L	1–2.5 L	3–10 L / 5.3 L–20 L / 6–30 L
Dimensions (W x D x H)	455 mm x 375 mm x 740 mm	350 mm x 520 mm x 960 mm	464 mm x 462 mm x 996 mm	559 mm x 442 mm x 996 mm	515 mm x 515 mm x 1050 mm	1017 mm x 934 mm x 1841 mm
Drive	Direct drive to 1600 min ⁻¹ Direct drive to 600 min ⁻¹ (cell version)	Magnetic drive to 1600 min ⁻¹ Magnetic drive to 300 min ⁻¹ (cell version)	Direct drive to 1500 min ⁻¹ Magnetic drive to 300 min ⁻¹ (cell version)	Air Lift	Direct drive to 1000 min ⁻¹	Direct drive to 1200 min ⁻¹ , Magnetic drive to 300 min ⁻¹ (cell version)
Temperature	Coolant temperature +10°C to 60 °C	Coolant temperature +5°C to 70 °C	Coolant temperature +5°C to 70 °C or 95 °C	Coolant temperature +15°C to 70 °C or 95 °C	Coolant temperature +5°C to 70 °C	Coolant temperature +5°C to 79 °C; up to 125 °C for sterilisation
Gassing per vessel	2 MFCs up to 2 min ⁻¹ (vvm) 5 MFC up to 0.15 min ⁻¹ (vvm) (cell version)	Up to 4 rotameters oder MFCs up to 2 min ⁻¹ (vvm) or 0,1 min ⁻¹ (vvm) (cell version)	Up to 5 MFCs, up to 2 min ⁻¹ (vvm) or 0,1 min ⁻¹ (vvm) (cell version)	Up to 5 MFCs 2 min ⁻¹ (vvm)	Up to 5 MFCs 2 min ⁻¹ (vvm)	Up to 3 MFCs
Pumps per vessel	4 x configurable (fixed or variable speed), ex-works 3 x fixed, 1 x variable	3 fixed, 1 variable, optional 1 additional variable	3 fixed, 1 variable, optional 2 additional variable	3 fixed, 1 variable, optional 2 additional variable	3 fixed, optional 2 additional variable	3 fixed (acid, base, anti-foam) 1 variable (feed1), optional 2 additional
Ports per vessel	7.5 mm 10 mm 12 mm (Pg13.5) max 7	4x 4x 10 mm 12 mm (Pg13.5) max 5	7 mm 10 mm 12 mm (Pg13.5) 19 mm	max. 4x 2x max. 6x max. 6x	1 x 4 mm 1 x 6 mm 3 x 10 mm 13 x 12 mm (Pg13.5)	2x 3x 4x 1x
Connectivity	OPC UA via Ethernet	OPC XML DA via Ethernet	OPC XML DA via Ethernet	OPC XML DA via Ethernet	OPC XML DA via Ethernet	OPC XML DA via Ethernet
Parallel operation via touch screen controller	n/a	3 base units, resp. 6 vessels	Up to 6 base units	Up to 6 base units	Up to 6 base units	n/a
Sterilisation	Autoclave	Autoclave	Autoclave or LabCIP (microbial version)	Autoclave	Autoclave	Sterilisation-in-Place

We will find the right solution for you. Always.

Every bioprocess is different – and sometimes very special. To help make your project a success, we offer custom-made versions of all devices.

Whether you want special stirrers and spargers on the Labfors or a Multitron capable to shake special types of flasks – we review every customer request with regard to feasibility.

All of the economic, technical and production-related aspects will be discussed with you to offer you a solution which meets your expectations.

Visit www.infors-ht.com to find your local INFORS HT representative who will be happy to discuss your project with you.

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