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biosan

Medical–Biological
Research & Technologies

WORLD OF BIOTECH-INNOVATICA

Catalogue 2021

WELCOME TO THE BIOSAN PRODUCT CATALOGUE 2021

For 29 years, the **mission of BIOSAN** has remained unchanged, reducing the risks of sample preparation by offering lines of laboratory equipment based on the most advanced scientific and industrial technologies.

The **catalogue of 2021** traditionally represents a wide range of laboratory equipment for carrying out both the simplest stages of sample preparation, such as mixing, shaking, centrifuging, incubation, and for implementing more complex and advanced stages — cell cultivation, nucleic acid isolation, as well as instruments for final result analysis.

For more convenience of selection, we have created a number of workflow description, which, we hope, will help you select the most appropriate product for your needs. ELISA, Nucleic Acid extraction and amplification, Microbial cell cultivation — these are only a few of them. From **Assist** pipettes to **3D-IW8** automated ELISA plate washers, from **MagSorb-16** magnetic stand for nucleic acid isolation to automated 12 channel nucleic acid processor **Biomagpure 12 Plus.** Our devices will allow you to properly and effectively prepare your sample and provide you with reliable results — like **Bioquant 96** Real-Time PCR instrument or **HiPo MPP-96** ELISA plate reader.

Instrument models are constantly being improved in accordance with the wishes and comments of our customers. We pay special attention to reliability, ergonomics and ease of use.

SAMPLE PREPARATION SOLUTIONS

We are focused on solving the problems of reproducibility of experimental data, the cause of which is usually the sample preparation of a biomaterial. The absence of strict rules for sample preparation leads to the greatest number of errors in implementing of the methodology.

Errors accumulate in connection with:

1. A significant decrease in the volumes of reactants (from millilitres to microliters);
2. The lack of intermediate temperature logistics of the technological process (temperature shelf);
3. The characteristics of mixing micro-quantities of reagents;
4. The lack of laboratory air decontamination systems in the process;
5. Inappropriate storage of cellular material not regulated by the method.

We offer solutions for sample preparation only after we make sure that they are ideal for eliminating the above-mentioned errors.

WORLD OF BIOTECH-INNOVATICA

We continue to develop the planetary model of the World of BIOTECH-INNOVATICA, and we are ready to offer you not only already known devices, but also completely new and unique equipment.

S-Bt Smart Biotherm CO_2 incubator appeared on **Cellomica** orbit, designed to work with cell cultures, where it is necessary to maintain a given CO_2 concentration, temperature and relative humidity. New shaker **CPS-20** was developed especially for the incubator, while the control module is brought outside of the incubator chamber, which ensures long-term operation of the shaker in an aggressive environment of carbonic acid, which is formed due to mixing of CO_2 and water vapour inside the incubator.

Unique devices such as **Reverse-Spinner RTS-1, RTS-1C** personal bioreactors have become popular tools among microbiologists. Bioreactors provide the necessary conditions for a reproducible bioprocess and non-invasive registration of cell culture specific growth rate in real-time.

The next generation of **Reverse-Spinner** bioreactors, the **RTS-8, RTS-8 Plus,** has been developed. These bioreactors can carry out parallel cultivation in 8 single-use tubes simultaneously. Together with the German company Presens Gmbh, we offer the **RTS-8 plus** bioreactor model with non-invasive measurement of pH and oxygen concentration during cultivation.

The DEN densitometer range includes a new **DEN-600** photometer a compact desktop device for measuring optical density at λ_{600} nm, designed for operation from either power supply or from the built-in rechargeable battery. The device has excellent technical characteristics for performing of measurements. USB connectivity allows data to be transferred to a PC for subsequent analysis.

CUSTOMER SUPPORT

We are attentive to all customer requests. Specialists of the company promptly provide warranty and post-warranty service, and solve problems that may arise from users both at the stage of ordering equipment and during operation and maintenance. We are always happy to assist you in developing skills in the operation and maintenance of our products.

Additional information about the products can be found on the website www.biosan.lv, including video of the products demonstrating the functional characteristics. Electronic brochures, catalogue and user manuals are also available for download.

VISION

We plan to continue our continuous improvement in order to remain your partner and expert in both Life Science research and medical diagnostics. This will allow us to develop new promising products, while remaining in the same row with the world's leading bioengineering companies.

We will be sincerely happy if you are interested in BIOSAN products. Thank you for your cooperation!

Vasily Bankovsky
Ph.D., Biology
President of BIOSAN

World of BIOTECH-INNOVATICA

"Most of the great innovations arose from the interaction of creative personalities with teams that managed to realize their ideas."

— Walter Isaacson

Vasily Bankovsky, Ph.D. (Biology), Head of R&D Department, Chairman of the Board at Biosan

The concept of development for Biosan called World of Biotech-innovatica. Four planetary systems with satellites — devices revolve around Terra Innovatica (biomaterial under research). We have marked out four planets — 4 contemporary levels of life science research, medical and veterinary diagnostics:

1. **Terra Genomica** — level of genes (DNA-analysis, oligonucleotide and mononucleotide polymorphism — ONP, SNP);
2. **Terra Immunologica** — level of immunology (detection of polymorphism of antibodies and immune response);
3. **Terra Biochemica** (metabolomics) — level of metabolism products and ferment activity;
4. **Terra Cellomica** — level of cellular morphogenesis (cellular polymorphism).

The distance from the planet orbitals to Terra Innovatica corresponds to the time of disease detection at each level (from one week, as in the case of DNA-analysis, to several years, when the changes can be tracymorphism at the level of genes leads to the manifestation of polymorphism at all higher levels, it results in the ambiguity (if not more) of any decision made based on the obtained data. The definition comprising the polymorphism of norm and abnormality (disease) is not yet available, this experience is still being gained, hence, the multianalysis technology, though expensive, is the only solution as of today.

Although the classic determinism in life science research and diagnostics has finally yielded its position to the stochastic one, there are still no instrumental solutions, that allow chanelling our new knowledge into informed and unambiguous decisions. This is the real situation; these are the temporary sacrifice of progress.

Biosan is the only company in the World of Biotech-innovatica, which develops, produces and distributes instrument lines for all four levels. These satellites of four planets are specialised devices providing the instrumental basis for multilevel analysis, whereas the reagent sets make these satellites move. Consequently, by the World of Biotech-innovatica we mean the direction of Biotechnology, responsible for the development of multilevel analysis sets (product lines). In the future perspective, multianalysis chips may appear with the development of chip technologies, allowing to unify all the technologies described above in one chip.

I am pleased to point out that many of our ideas and products have been developed as a result of the long-standing cooperation between scientists and developers of Biosan with universities, as well as with academic institutes and institutes of applied sciences and our company customers worldwide.

All our inventions resulted from joint efforts, and today we are still open for collaboration. We will be delighted if the result of our work — which has already received wide recognition of the scientific community — would also be of interest for you, particularly if it would serve as yet another starting point for the development of innovative biotechnologies and appearance of new planets and their satellites in the sky of the World of Biotech-innovatica.

Sincerely,
Vasily Bankovsky, Ph.D. (Biology)
Head of R&D Department
Biosan, Chairman of the Board

World of BIOTECH-INNOVATICA

TERRA CELLOMICA

Research and diagnostics at the level of cellular morphogenesis (cellular polymorphism);

TERRA BIOCHEMICA (metabolomics)

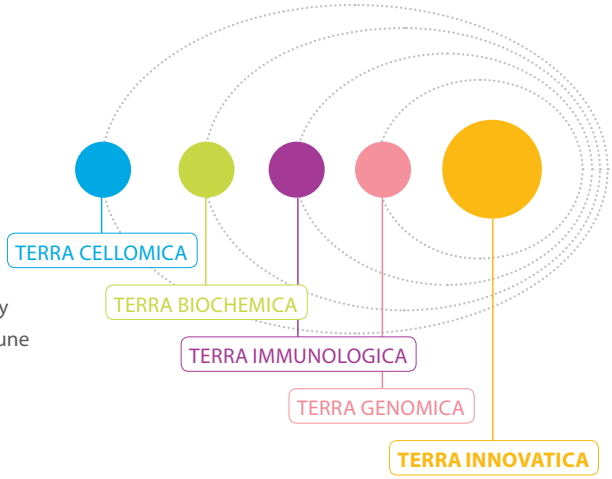
Research and diagnostics of metabolism products and enzyme activity;

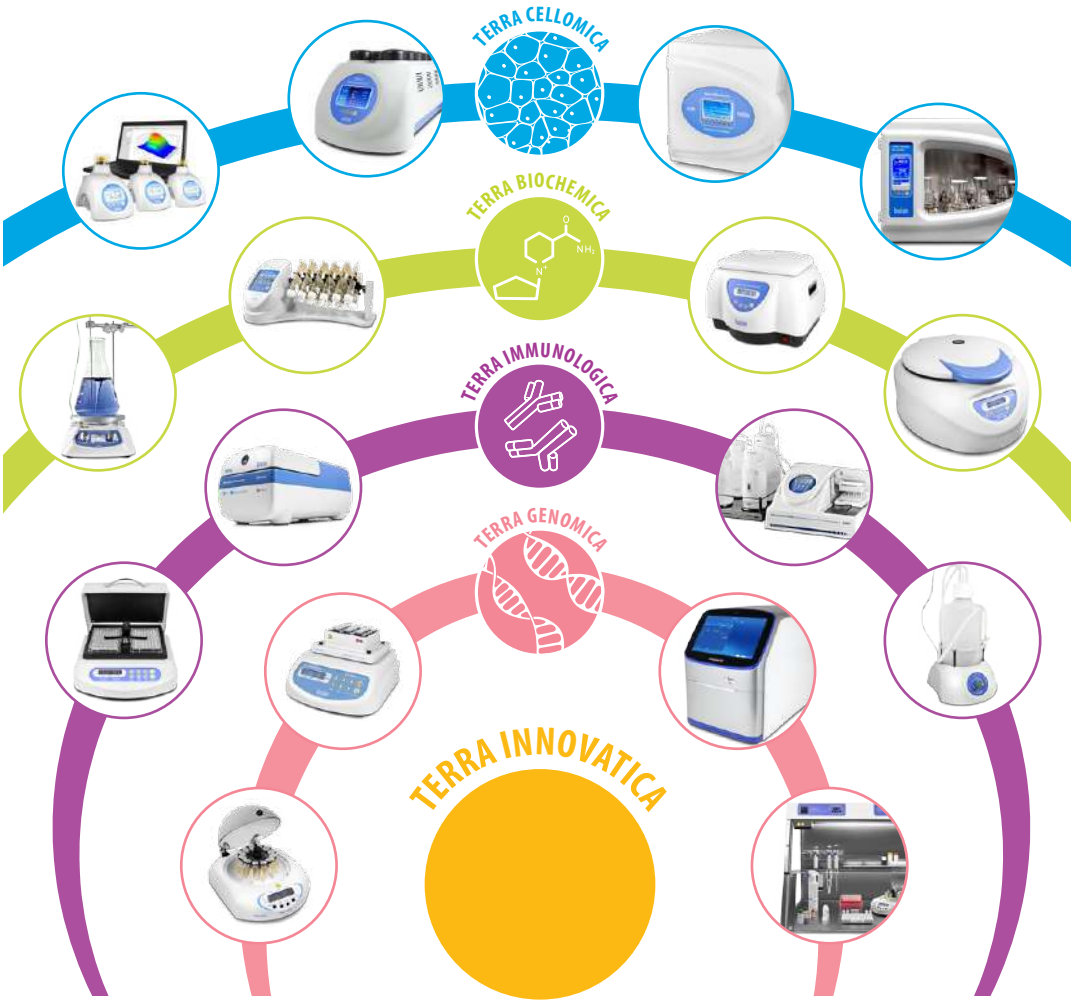
TERRA IMMUNOLOGICA

Research and diagnostics at the level of immunology (detection of polymorphism of antibodies and immune response);

TERRA GENOMICA

Research and diagnostics at the level of genes (DNA-analysis, sequencing oligonucleotide and mononucleotide polymorphism — ONP, SNP).





NEW PRODUCTS AND ANNOUNCEMENTS

NEW PRODUCTS

COVID-19 Product line
Photometer: DEN-600
Multi-channel bioreactors: RTS-8, RTS-8 Plus
Shaker-incubator: ES-20/80
Real-time PCR detection system: BioQuant-96
CO_2 shaker: CPS-20
CO_2 incubator: S-Bt Smart BioTherm
Thermoshaker: TS-100C Smart
Shelves for DNA/RNA UV-cleaner boxes: P-5, F-1
Sticky mats: SPML, SPM
DNA/RNA Decontamination Solution, 10l: PDS-10L

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Shaker-incubator with cooling: ES-20/80C
Centrifuge: LMC-56
Homogenizer: RCP-24

UPGRADE

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COVID-19

The global coronavirus (COVID-19) outbreak marks the necessity of fast and reliable sample preparation as well as safe working environment. To facilitate products selection, here are shown ready product lines to start COVID-19 sample analysis rapidly.

Preventive

Decontamination

UVR-M/UVR-Mi
UV Cleaner–Recirculators

NEW see page 96

PDS-250, PDS-10L
DNA/RNA decontamination solution

Air

Surface

ELISA based detection methods

Steps

Incubation

PST-60HL-4
Plate Shaker-Thermostat

PST-60HL
Plate Shaker-Thermostat

PSU-2T
Mini-shaker for immunology

Washing

Assist
Pipette series

Assistboy
Pipette controller

FTA-2i
Aspirator with Trap Flask

3D-IW8
Inteliwasher

Detection and analysis

HiPo MPP-96
Microplate Photometer

+

Quant Assay
Software for HiPo MPP-96

NA based detection methods

Manual preparation

Working area

UVT-S-AR
DNA/RNA UV-cleaner box

Resuspension of probes and reagents

V-1 Plus
Personal Vortex

MSC-3000
Centrifuge/Vortex Multispin

Sample lysis

TDB-120
Dry block thermostat

Sample wash

Assist
Pipette series

FTA-2i
Aspirator with Trap Flask

Elution of NA

NEW see page 134

MagSorb 16
Magnetic Rack for Manual Nucleic Acid Extraction

Microspin 12
High-speed Mini-centrifuge

Automated preparation

TS-100C Smart
Programable Termo-Shaker with cooling for microtubes and PCR plates

NEW see page 132

Biomagpure 12 Plus
Compact Bench-Top Robotic Workstation for Automated Nucleic Acid Purification (+ reagents)

Sample detection and analysis

Preparation

CVP-2
Plate centrifugation and vortexing

MSC-6000
Tube centrifugation and vortexing

Real time PCR detection

NEW see page 135

BioQuant-96
Real time PCR instrument

abTes COVID-19 qPCR kit (Reagents are CE-IVD certified – among WHO listed kits.)

RTS-8, RTS-8 Plus NEW see page 122

Parallel bioreactors with non-invasive measurement of cell concentration (pH and pO_2 — RTS-8 Plus) in real time

RTS-8, RTS-8 plus is the next generation of parallel bioreactors using disposable 50 ml test tube reactor vessels and the Reverse-Spin® mixing principle.

New features:

- Performing eight bioprocesses simultaneously in one device allows to study the effect of various factors on the bioprocess and optimize cell culture cultivation conditions (temperature, tube rotation speed, pO_2, pH, concentration of various substrates).
- Real-time multi-angle photometry of a test tube-reactor allows non-invasive recording of OD in a wide range — up to 100 OD (600 nm).
- The cultivation of a wide range of microorganisms, such as aerobic, aerotolerant or anaerobic microorganisms.
- Profitable purchase - the user receives one eight channel RTS-8 compact bioreactor instead of five separate RTS-1C.
- Unique technology used in RTS-8 Plus device for non-invasive measurement of oxygen concentration O_2 and pH during the experiment. This device was developed in cooperation with Presens, Germany.
- The software supplied with the device provides control and recording of the specified cultivation parameters, as well as option to save the data in Excel for further processing of the obtained results.

Tubes for RTS-8 Plus with sensor

PC software

CPS-20 NEW see page 116

CO_2 Shaker

CO_2 Shaker **CPS-20** provides regulated orbital motion of the platform and is designed for use in Biosan's S-Bt CO_2 Incubator. **CPS-20** is specifically designed in harsh environments such as CO_2 and humidity and provides reproducible results for cell culture growth. A choice of five interchangeable platforms provide the possibility of performing various procedures and techniques in various cultivation vessels.

CPS-20 incorporates a brushless motor with a guaranteed service life of up to 35,000 hours. The unit is equipped with a triple eccentric mechanism for platform motion that provides supreme balancing characteristics, superior reliability and quiet operation. The specially designed remote controller allows for the protection of electronics from a CO_2 incubator environment, as well as, the remote control minimizes interference with the incubator environment and the ongoing experiment.

S-Bt Smart BioTherm NEW see page 114

Compact CO_2 incubator

S-Bt Smart Biotherm is designed for work in the areas of cell biology (operations with animal cell cultures and tissues), molecular biology (DNA/RNA reaction analysis, hybridization reactions), biotechnology (synthesis of target proteins and other molecules), immunology (synthesis of antibodies and other proteins of the immune system). Unit provides six-sided heating: the heating elements are located on the walls and the door, thus providing excellent uniform temperature distribution, regardless of external factors, such as ambient temperature and positioning of the device.

Built-in infrared CO_2-sensor allows precise control of the CO_2 level. The sensor makes measurement non-sensitive to changes in temperature and humidity inside the incubator.

The chamber is made of stainless steel with smoothed seams to minimize contamination and to facilitate cleaning.

S-Bt is equipped with a UV air recirculation system — 1 UV lamp and a fan are mounted behind the rear wall, providing decontamination of the working volume.

A convenient access port is built in the incubator's wall for easy output of wire sensors or devices' installed inside. The access port is heated independently to prevent the formation of condensate.

Unit is equipped with error tracing and alarm systems, which significantly lower potential risks during operation.

Unit is equipped with a "black box" system that records temperature, humidity and CO_2 levels to the internal memory. Bluetooth® connection to PC is available.

ES-20/80C ANNOUNCEMENT

Shaker-incubator with cooling

Orbital Shaker–Incubator with cooling **ES-20/80C** for biotechnological and pharmaceutical laboratories is a next-generation, professional category equipment.

ES-20/80C duplicates the functionality of ES-20/80 and also uses a Peltier element to cool the camera. A built-in heat-resistant brushless fan provides precise temperature distribution inside the chamber (from 12.5 °C below ambient up to +80 °C). Additionally, excellent sample temperature uniformity of ±0.2 °C at 37 °C is achieved.

ES-20/80 NEW see page 124

Shaker-incubator

ES-20/80 shaker-incubator for biotechnological and pharmaceutical laboratories is professional category equipment. The typical applications include - microbial and cell culture cultivation, protein expression, solubility studies, general mixing, as well as other various applications in the fields of biology and chemistry. The unit is equipped with a newly developed triple eccentric mechanism for platform motion that provides supreme balancing characteristics, superior reliability and quiet operation. The unit's achieved stability during vigorous mixing allows for stacking installation of up to 3 units which enables to save space. The new display and easy to use user interface provide a clear and intuitive control of parameters and also allow data logging, storage and display over time. Additional features like out-of-balance sensor and automatic thermostat failure detection make this shaker-incubator an advanced and safe product. Bluetooth® connectivity to PC allows for data management, data logging, parameter control and profiling in dedicated software that can be requested separately.

A built-in heat-resistant brushless fan provides precise temperature distribution inside the chamber (from 10 °C above ambient up to +80 °C). Additionally, excellent sample temperature uniformity of ±0.3 °C at 37 °C is achieved. The inner chamber is made of stainless steel. State-of-the-art motor, thermal insulation materials and parameter PID-control decrease the energy consumption and make the shaker-incubator highly energy efficient despite its relatively large size.

SOFTWARE UPDATE see page 142

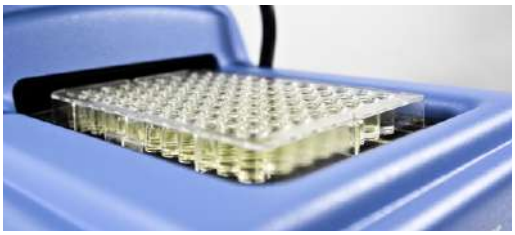
HiPo MPP-96

Microplate Photometer

Microplate Photometer HiPo is a compact tabletop device for measuring optical density — results of ELISA and microbiological studies in 96-well microplates. Photometer is controlled and outputs data via computer. An extensive range of additional interference filters is available (with an average increment of 10 nm).

The device is supplied with specialized software **QuantAssay**. Features of **QuantAssay** software:

- ELISA assays of any complexity can be carried out via robust assay editor with the help of Assay Wizard
- Quantitative assay includes up to 20 standards
- Avidity/Affinity assays
- Multiplex assays with up to 7 assays on one plate
- Qualitative assay includes up to 11 controls
- BestFit function for selecting the best calibration curve
- User-friendly interface: get your results in 3 clicks
- Save, load and export results
- LIMS export integration
- Creates visual reports



RCP-24 ANNOUNCEMENT see page 34

Homogenizer

Reciprocal Homogenizer **RCP-24,** a bench-top mechanical device designed for mixing, grinding, homogenizing and emulsifying biological objects in microtubes by vigorously mixing by reciprocal motion with various beads for sample preparation for subsequent academic, pharmaceutical, biotechnological or biomedical studies.

PDS-10L NEW see page 96

DNA/RNA Decontamination Solution

PDS-250 decontamination solution is now available in 10 l containers — **PDS-10L.**

PDS-250 is a ready-to-use solution for eliminating DNA and RNA from the surface prior PCR reaction preparation. DNA/RNA is removed within seconds after use. The solution contains a non-alkaline and non-carcinogenic agent. PDS-250 is intended for use at PCR cabinets and laminars (e.g. UVT-S-AR), lab devices — BioMagPure 12, TS-100, pipettors — Assist series pipettes, etc.

DEN-600 NEW see page 104

Photometer

DEN-600 is a compact, portable, rechargeable battery-powered photometer. It comprises of 600 nm wavelength optical system, which enables to apply: 1) OD_{600} method that estimates total number of cells, 2) McFarland (McF) turbidity measurement method, 3) Bradford protein assay method for protein concentration measurement.

The device serves as an inexpensive alternative to a spectrophotometer, which is commonly used for these applications. Because **DEN-600** is battery powered and compact, it can be comfortably located in a biosafety cabinet, anaerobic chamber or quickly moved to another lab room. Additionally, the vessel holding mechanism allows accommodating round bottom, conical vials or falcon tubes, therefore enabling to measure the absorbance (Abs) and turbidity in Abs, OD and McFarland units.

USB connectivity and DEN software allow for data transfer, data processing and calculation, software calibration for Bradford protein assay method or a custom calibration for a specifically suitable vessel.

DEN-1 UPGRADE see page 102

Densitometer

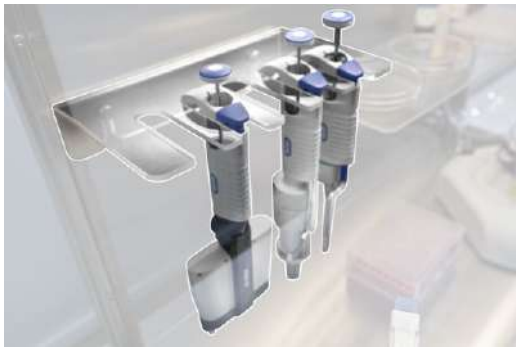
DEN-1 updated with the new casing and display, measuring characteristics have also been improved, which corresponds to the specification of the **DEN-1B** version. The difference from **DEN-1B** is just that DEN-1 cannot operate on a battery.

P-5, F-1 NEW see page 93

Shelves for DNA/RNA UV-cleaner boxes

Two types of shelves have been developed for DNA/RNA UV-cleaner boxes to increase the boxe's effective area: **P-5** — shelf-holder for 5 pipettes and **F-1** flat shelf.

On the **F-1** shelf, you can place laboratory glassware, reagents and other items that are convenient to keep in close proximity.



TS-100C Smart NEW see page 38

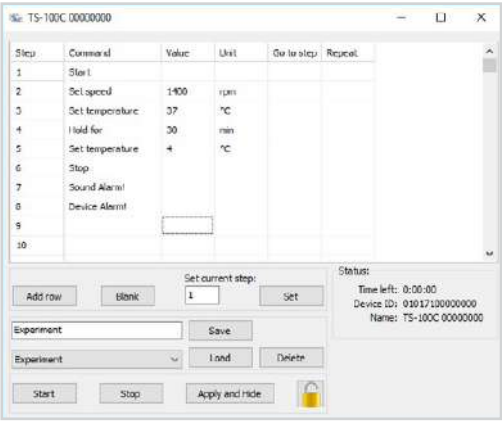
Thermo-shaker

The new model allows you to control the device in the following modes:

1. Manual using the front panel interface.
2. Through a computer program using Bluetooth® technology.
   The software allows you to manage the following parameters:
   - Rotation speed
   - Temperature
   - Time
   - Sound signal
   - Creating Profiling programs using controlled parameters
   - Visualization of temperature vs time and speed vs time graphs
   - Data export to Excel and CSV formats
   - Error messages/Fault diagnostics

Possibility of control up to 7 units from PC. Independent parameter setting allows performing different tasks simultaneously on several units. Software is included in standard set.

Software – Profiling Window



LMC-56 ANNOUNCEMENT

Centrifuge

LMC-56 is a bench-top, low-speed multifunctional centrifuge for routine laboratory tasks.
Perfect for biochemical, cytological, immunological analyzes. It can be used for sample preparation in research, biomedical and genetic laboratories.
The precursor of this centrifuge is Well-known among users in Europe laboratory centrifuge LMC-3000.

New centrifuge has significantly improved features:

- Higher speed — maximum 6,000 rpm or 3,160 *g*;
- New bucket rotors, having maximum total capacity up to 400 ml;
- A wide selection of rotors — up to 13;
- Automatic recognition of rotors and setting the maximum speed for each rotor type;
- Improved ventilation of the working chamber to reduce tube heating during centrifugation;
- Several types of acceleration and braking;
- Auto-stop in case of imbalance.

SPM

SPML

SPM, SPML NEW see page 22

Double-sided adhesive strips and mat

Convenient alternative to traditional steel holders, an easy way to fix tubes, plates, flasks and other laboratory wares on platforms for cultivation, incubation and mixing.

SPML, set of 3 double-sided adhesive strips

SPM, double-sided adhesive mat

BioQuant-96 NEW see page 135

Real-time PCR detection system

BioQuant-96 is the newest product of Biosan Molecular diagnostic product family.

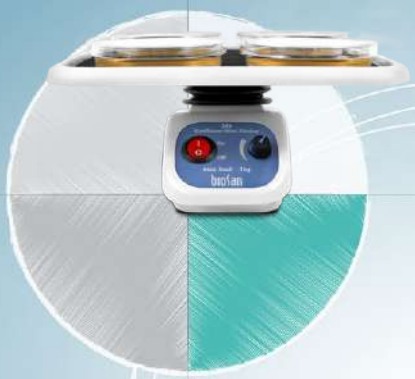
It has adopted innovative thermoelectric refrigeration technology, brand-new light source and light path design. Detection from the top allows using different consumables – 0,2 tubes, 8-tube strips and semi-skirted and non-skirted 96-well PCR plates. The unique constant current power and 6-zone independent temperature control method ensure more rapid, correct and stable fluorescence quantitative analysis, while maintaining its excellent performance in lowest possible energy consumption.

Device is available in 5-channel and 6-channel configuration. Meanwhile, it has been added with functions including independent temperature control, low temperature storage of sample at 4°C and FAST mode for more faster cycling (confirm reagent compatibility with fast mode).

BioQuant-96 is comprehensively realizing automatic gain setting and improving user experience. It will fully meet the demand of scientific research laboratories and registered as I (A) class Medical device in EU it also will fully meet the requirements of any diagnostic laboratory.

MIXING DEVICES:

ROCKERS, SHAKERS, ROTATORS, VORTEXES, HOMOGENIXER



3D

Sunflower Mini-shaker

MPS-1

High-Speed Multi Plate Shaker

Multi Bio RS-24

Programmable rotator

Catalogue 2021

MR-1, Mini Rocker–Shaker

DESCRIPTION

Mini Rocker-Shaker **MR-1** provides regulated gentle rocking motion of the platform and is ideal for mini gel destaining after electrophoresis, conducting Northern, Southern and Western blot analysis.

Shaker is a compact, noiseless device designed for personal use. Drive and brushless motor allow continuous mixing up to 7 days and ensures reliable, trouble-free operation for more than 2 years.

Non-slip, temperature resistant, silicone mat located on the rocker's platform provides a stable position for vessels during shaking. Optional dimpled PDM mat fixes tubes of different sizes.

The unit is designed for operation in cold rooms, incubators (excluding CO_2 incubators) and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

ACCESSORIES FOR THE STANDARD PLATFORM:

Optional dimpled mat **PDM** prevents different size tubes from rolling around the platform

Basic Plus
Product Class

7°
Rocking uni-rotation

Product video is available on the website

MR-12, Rocker–Shaker

DESCRIPTION

MR-12 Rocker–Shaker provides both soft and intensive mixing of solutions or nutrient media in vessels or plastic bags placed on the platform. Adjustable speed and platform tilt angle allows setting parameters for optimal solution transfer and mixing.

The device is ideal for gel destaining after electrophoresis and homogenisation of bioextraction media. It is optimal for biomolecule hybridisation on strips and staining/destaining procedures. When installed inside a bioincubator it is ideal for growing cells and cell cultures in disposable plastic reactor-bags (working volumes up to 10 litres, media volumes up to 5 litres).

The unit is designed for operation in cold rooms, incubators (excluding CO_2 incubators) and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C. Low voltage external power supply (12V) provides electrical safety in humid environment.

Premium
Product Class

0–10°
Rocking uni-rotation with adjustable tilt

MR-1 and MR-12, Rocker-Shakers

SPECIFICATIONS

	MR-1	MR-12
Mixing frequency range	1–30 oscill./min	1–99 oscill./min (increment 1 oscill./min)
Fixed tilt angle	7° (fixed)	0°–10° (increment 1°) (for 1–50 oscill./min) 10° (for 51–99 oscil./min)
Max. continuous operation time	168 h	
Digital time setting	1 min–24 h/non-stop	1 min–99 h 59 min (increment 1 min)/non-stop
Timer sound signal	—	yes
Non-slip silicone mat is supplied as standard	215 × 215 mm	480 × 380 mm
Maximum load	1 kg	5 kg
Display	LED	LCD, 2 × 16 signs
Platform working area	215 × 215 mm	480 × 380 mm
Overall dimensions (W×D×H)	220 × 205 × 120 mm	430 × 480 × 210 mm
Weight	2.1 kg	11.9 kg
Input current/power consumption	12 V, 320 mA/3.8 W	12 V, 1.1A/13 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V	

PDM, dimpled mat

MR-1 with PDM dimpled mat

MR-12

ORDERING INFORMATION:

	Cat. number
MR-1 with standard platform **Bio PP-4S**	BS-010152-AAG
MR-12 with standard platform **PP-480**	BS-010130-AAI
Optional accessories: for MR-1:	
PDM, dimpled mat	PDM

3D, Sunflower Mini-Shaker

DESCRIPTION

"Sunflower" **3D** Mini–Shaker provides adjustable three-dimensional smooth rotation of the platform and is designed for mixing blood samples, minigel staining and destaining, sample washing, blot hybridisation reactions.

Mini–Shaker is a compact device with low energy consumption. The use of direct drive and brushless motor allows continuous mixing up to 7 days and ensures reliable, trouble-free operation for many years.

Non–slip, temperature resistant, silicone mat located on the shaker's platform provides a stable position for vessels during shaking. The platform is suitable for placing a versatile dimpled PDM mat for different size tubes.

Mini–Shaker can be used in cold rooms or incubators, operating at ambient temperature range +4°C to +40°C.

Basic Plus
Product Class

3D — uni–rotation

Product video is available on the website

Multi Bio 3D, Programmable mini-shaker («Sunflower» type)

DESCRIPTION

Programmable mini-shaker **Multi Bio 3D** is designed for various applications: hybridization reactions, cell growing, gel washing, soft extraction and homogenisation of biological components in solutions.

Multi Bio 3D provides realization of several types of motion in one module. This option of Biosan instruments essentially extends possibilities and enhances the efficiency of preparation of test samples as well as allows selecting the mixing type according to individual requirements.

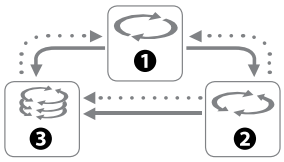
Microprocessor control allows performing ❶ **Orbital 3D rotation** of the platform and but also ❷ **Reciprocal 3D motion** (of ping–pong type) and ❸ **Soft vibrating rocking.** These three motion types can be performed separately, pairwise and in cycles, periodically repeating the sequence of three motion types. The shaker is designed for laboratories with increased demands for the quality of mixing, extraction and cell growing processes.

Non–slip, temperature resistant, silicone mat located on the shaker platform provides a stable position for vessels during shaking. Optional dimpled PDM mat fixes tubes of different sizes.

Programmable shaker can be used in cold rooms or incubators, operating at the ambient temperature range +4°C to +40°C.

Premium
Product Class

Ø 22 mm
orbit



Multi–rotation

Product video is available on the website

3D Mini-Shaker and **Multi Bio 3D**, Programmable 3D shaker («Sunflower» type)

	3D	Multi Bio 3D
❶ Speed control range (orbital and reciprocal motion)	5–60 rpm	1–100 rpm
❷ Turning angle (reciprocal motion)	—	0–360° (increment 30°)
❸ Rocking angle (vibro motion)	—	0–5° (increment 1°)
Fixed tilt angle	7°	
Orbit	—	22 mm
Platform working area	215 × 215 mm	
Non-slip silicone mat is supplied as standard		
Maximum continuous operation time	168 h	24 h
Time setting range for ❶ ❷	—	0–250 s
Time setting range for ❸	—	0–5 s
Number of cycles	—	0–125 times
Timer sound signal	—	yes
Maximum load	1 kg	
Overall dimensions (W × D × H)	235 × 235 × 140 mm	
Weight	1.2 kg	1.8 kg
Input current/power consumption	12 V, 260 mA/3.1 W	12 V, 380 mA/4.6 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V	

Accessories for the standard platform:

Optional dimpled mat **PDM** prevents different size tubes from rolling around the platform

PDM, dimpled mat

Multi Bio 3D with PDM mat

ORDERING INFORMATION:

	Cat. number
3D with stand. platform **Bio PP-4S**	BS-010151-AAG
Multi Bio 3D with stand. platform **Bio PP-4S**	BS-010125-AAG

Optional accessories:

PDM dimpled mat	PDM

PSU-10i, Orbital Shaker

DESCRIPTION

Shaker **PSU-10i** provides regulated orbital motion of the platform and is designed for use both in small specialized biotechnological laboratories and in large multidisciplinary laboratories: a choice of five (5) interchangeable platforms provides the possibility of performing various procedures and techniques.

Shaker **PSU-10i** incorporates a direct drive system, a brushless motor with a guaranteed service life of up to 35,000 hours and an automatic loading balancing system. These innovations allow for continuous mixing up to 7 days, ensure reliable, trouble-free operation for more than 2 years and significantly expand the device performance range in both high and low limits.

The unit is designed for operation in cold rooms, incubators (excluding CO_2 incubators) and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

Premium
Product Class

Ø 10 mm
orbit

Product video is available on the website

PSU-20i, Orbital Shaker

DESCRIPTION

Shaker **PSU-20i** provides three motion types: ❶ **Orbital,** ❷ **Reciprocal** and ❸ **Vibrating,** which can be performed separately, pairwise and sequentially in repeated cycles.

Shaker is designed for applications both in small specialized laboratories and in large multidisciplinary laboratories. **PSU-20i** is an ideal instrument for laboratories researching biopharmaceutics and biomedicine.

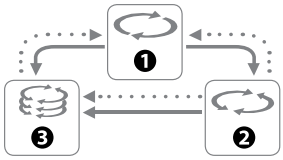
Shaker **PSU-20i** is noiseless and reliable in operation, incorporates a direct drive system and brushless motor with a guaranteed service life up to 35,000 working hours. Direct drive and brushless motor allows for continuous mixing for up to 7 days and ensures reliable operation for more than two years.

A choice of nine different interchangeable platforms provides the possibility of performing various procedures and techniques. Special attention should be paid to a multilevel platform, which allows accommodation of a large number of various microplates, Petri dishes, cultural bags and other low containers.

The unit is designed for operation in cold rooms, incubators (excluding CO_2 incubators) and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

Premium
Product Class

Ø 20 mm
orbit



Multi-motion

Description and pictures of all platforms can be found on page 22-23

PSU-10i and PSU-20i, Orbital Shakers

SPECIFICATIONS

	PSU-10i	PSU-20i
Multi-motion	—	yes
Speed control range*	50–450* rpm (increment 10 rpm)	20–250* rpm (increment 5 rpm)
Digital speed control	yes	
Max. continuous operation time	168 h	
Orbit	10 mm	20 mm
Digital time setting	1 min–96 h/non-stop	
Timer sound signal	yes	
Maximum load	3 kg	8 kg
Overall dimensions (W×D×H)	255 × 255 × 100 mm	410 × 410 × 130 mm
Weight	3.4 kg	11.7 kg
Input current/power consumption	12 V, 800 mA/9.6 W	12 V, 3.2 A/40 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V	

* — max. speed depends on the load and vessels' shape

Platform P-6/250 for PSU-10i

Platform Bio PP-4 for PSU-10i

Platform for PSU-20i PP-20/4

Platform Bio PP-4 for PSU-10i

ORDERING INFORMATION:

	Cat. number
PSU-10i, Shaker without platform	BS-010144-AAN
PSU-20i, Shaker without platform	BS-010145-ACI

PSU-20i motion types	Description	Speed range	Turning angle	Motion timer*	Digital time setting
❶ Orbital	Orbital motion with an option of shifting direction	20–250 rpm	—	0–250 s	1 min–96 h (increment 1 min) or non-stop
❷ Reciprocal	Orbital motion with shifting direction of rotation	20–250 rpm	0–360° (30° increment)	0–250 s	
❸ Vibrating	High speed, low amplitude motion	—	0–5° (1° increment)	0–5 s	

* — for switching to the next motion in the cycle

Description and pictures of all platforms can be found on page 22-23

Platforms for **PSU-10i** and **ES-20**

Platform	Description	Dimensions (Working area)	Cat. number
UP-12 Used on PSU-10i, ES-20	Universal platform with adjustable bars for different types of flasks, bottles and beakers with silicone mat	285 × 220 × 40 mm (270 × 185 × 40 mm)	BS-010108-AK
Bio PP-4 Used on PSU-10i	Flat platform with silicone mat for Petri dishes, culture flasks, agglutination cards	255 × 255 mm (230 × 230 mm)	BS-010116-AK
PP-4 Used on ES-20, PSU-10i	Metallic flat platform with silicone mat for Petri dishes, culture flasks, agglutination cards	220 × 220 mm (215 × 215 mm)	BS-010108-BK
NEW **SPM**	Double-sided adhesive mat as an alternative for regular flask clamps (for PP-4)	220 × 220 mm (1 per platform)	BS-010111-BK
P-12/100 Used on PSU-10i, ES-20	Platform with clamps for flasks, 100–150 ml (12 places)	250 × 190 mm (250 × 190 mm)	BS-010108-EK
P-6/250 Used on PSU-10i, ES-20	Platform with clamps for flasks, 250–300 ml (6 places)	250 × 190 mm (250 × 190 mm)	BS-010108-DK
P-16/88 Used on PSU-10i, ES-20	Platform with spring holders for up to 88 tubes up to 30 mm diameter (e. g. 10 ml, 15 ml, 50 ml tubes)	275 × 205 × 75 mm (275 × 205 × 75 mm)	BS-010116-BK

SPML, SPM, Double-sided adhesive strips and mat NEW

DESCRIPTION

Convenient alternative to traditional steel holders, an easy way to fix tubes, plates, flasks and other laboratory wares on platforms for cultivation, incubation and mixing. Two size options are offered **SPML** can be used with UP-168 platform on Biosan orbital shaker PSU-20i and in ES 20/80, ES 20/60 orbital shakers.

SPM is compatible with PP-4 platform, which fits both on PSU-10i orbital shaker and in ES-20 Shaker-Incubator.

Made of polyurethane with adhesive, simple to clean and durable, able to withstand up to 1,000 times placement/removal or 12 months of use. Additional information about temperature, working volume and speed limitations available in the user manual.

SPM on PP-4 platform

SPECIFICATIONS

SPML Size (L×W×H)	390 × 80 × 3 mm (double sided 1.5 mm PU with PET adhesive)
SPM Size (L×W×H)	210 × 210 × 3 mm (double sided 1.5 mm PU with PET adhesive)
Colour	transparent
Duration of use	up to 1,000 times placement/removal or 12 months
Temperature range	+4C° to +80C°
Shaking speed	0–300 rpm

SPML on UP-168 platform

ORDERING INFORMATION:

	Cat. number
SPM, Double-sided adhesive mat	BS-010111-BK
SPML, Set of 3 double-sided adhesive strips	BS-010135-MK

Platforms for **PSU-20i** and **ES-20/60**

Platform	Description	Dimensions (Working area)	Cat. number
UP-330 Used on PSU-20i	Universal platform with adjustable bars for different types of flasks, beakers	345 × 430 × 105 mm (300 × 400 × 80 mm)	BS-010145-AK
P-30/100 Used on PSU-20i, ES-20/60	Platform with 30 clamps for 100–150 ml flasks	360 × 400 mm (360 × 400 mm)	BS-010135-BK
P-16/250 Used on PSU-20i, ES-20/60	Platform with 16 clamps for 250–300 ml flasks	360 × 400 mm (360 × 400 mm)	BS-010135-CK
P-9/500 Used on PSU-20i, ES-20/60	Platform with 9 clamps for 500 ml flasks	360 × 400 mm (360 × 400 mm)	BS-010135-AK
P-6/1000 Used on PSU-20i, ES-20/60	Platform with 6 clamps for 1,000 ml flasks	360 × 400 mm (360 × 400 mm)	BS-010135-DK
PP-400 Used on PSU-20i, ES-20/60, ES-20/80	Flat platform with non-slip silicone mat	360 × 400 mm (360 × 400 mm)	BS-010135-FK
UP-168 Used on ES-20/60, ES-20/8	Universal platform for different flasks (Clamps ordered separately)	360 × 400 mm (360 × 400 mm)	BS-010135-JK
FC-50 **FC-100** **FC-250** **FC-500** **FC-1000** **FC-2000** used on PSU-20i	Clamp for 50, 100, 250, 500, 1000, 2,000 ml flask (for UP-168)	Ø 50 mm Ø 65 mm Ø 85 mm Ø 105 mm Ø 130 mm Ø 165 mm	BS-010126-MK BS-010126-HK BS-010126-JK BS-010126-LK BS-010126-IK BS-010126-NK
NEW **SPML**	Set of 3 double-sided adhesive strips as an alternative for regular flask clamps (for UP-168)	390 × 80 × 3 mm (3 per platform)	BS-010135-MK
TR-21/50	Test tube rack for 50 ml with 21 drillings (for UP-168)	340 × 124 mm (2 per platform)	BS-010135-KK
TR-44/15	Test tube rack for 15 ml with 44 drillings (for UP-168)	340 × 124 mm (2 per platform)	BS-010135-LK
PP-20/4 Used on PSU-20i	Four-level flat platform with non-slip rubber mat	380 × 480 × 510 mm (365 × 465 × 510 mm)	BS-010126-EK
PP-20/3 Used on PSU-20i	Three-level flat platform with non-slip rubber mat	380 × 480 × 340 mm (365 × 465 × 340 mm)	BS-010126-DK
PP-20/2 Used on PSU-20i	Two-level flat platform with non-slip rubber mat	380 × 480 × 170 mm (65 × 465 × 170 mm)	BS-010126-CK
PP-20 Used on PSU-20i	One-level flat platform with non-slip rubber mat	380 × 480 mm (365 × 465 mm)	BS-010126-BK

MPS-1, High–Speed Multi Plate Shaker

Premium
Product Class

Vortex

Ø 3 mm
orbit

DESCRIPTION

High–Speed Multi Plate Shaker **MPS-1** can be used in virtually any application by providing adjustable mixing of reagents in microtest plates, PCR plates, deepwell plates and test tubes (shaking tubes 0.2 to 2 ml and vortexing any volume up to 50 ml).

The shaker is compact and user–friendly. The shaker is ideal for personal use.

MPS-1 features a head for vortexing a single tube.

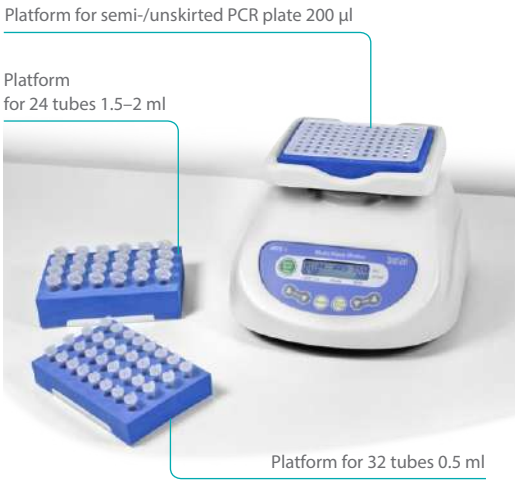
The unit is designed for operation in cold rooms, incubators (excluding CO_2 incubators) and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C. Low voltage external power supply (12 V) provides electrical safety in a humid environment.

MPS-1 features **Pulse Mode** mixing function that works on the principle of giving a periodic impulse: the tube is accelerated to the set speed, holds it for 3 seconds and then drops the speed to zero. This motion is repeated until the timer runs out. This method provides a constant state particle resuspension inside a tube, as the acceleration is always changing. The advantage of this method is the high throughput of mixed samples compared to vortexing a single tube.

Product video is available
on the website

Features

- Speed control range 300–3,200 rpm
- Stable mixing with 3 mm orbit
- Five mixing presets
- **Pulse Mode** mixing function
- Quiet operation — low noise at maximum speed
- Universal platform holder for Deepwell plates and Microtest plates
- Additional four platforms for semiskirted and unskirted PCR plates 200 µl as well as for tubes from 0.2 to 2 ml



MPS-1, High–Speed Multi Plate Shaker

SPECIFICATIONS

Vortexing a 50 ml tube

Vortexing a 15 ml tube

Deepwell plate 96/1000 µl

Microtest plate 200 µl

Deepwell plate 96/500 µl

Mixing Speed control range	300–3,200 rpm
Platform options:	
– For semi-\unskirted PCR plate or 96 microtest tubes 0.2 ml	**P-02/96**
– For 24 microtest tubes 1.5–2 ml	**P-2/24**
– For 32 microtest tubes 0.5 ml	**P-05/32**
– For 24 microtest tubes 0.5 ml and 48 microtest tubes 0.2 ml	**P-02/05**
– Universal platform for deepwell plates, 96-well microtest plates (U, V or flat bottomed), 384-well microtest plates	
Types of mixing presets:	
VORTEX	3,200 rpm
HARD	2,600 rpm
MEDIUM	1,800 rpm
SOFT	1,000 rpm
CUSTOM	adjustable rpm
Features a **Pulse Mode** mixing function	
Features a Vortex function	
Maximum load	0.3 kg
Mixing Orbit	3 mm
Acceleration time to maximum speed	5 s
Digital time setting	0–60 min (15 s increment)/non-stop
Timer sound signal	yes
Maximum continuous operation time	8 h
Noise level, not more	65 dB
Weight	5.1 kg
Overall dimensions (W×D×H)	225 × 215 × 150 mm
Input current/power consumption	12 V, 800 mA / 10 W
External power supply	Input AC 100–240 V 50/60 Hz; Output DC 12 V

ORDERING INFORMATION:	Cat. number
MPS-1, Multi Plate Shaker with built-in universal platform	BS-010216-A03
MPS-1, Multi Plate Shaker with built-in universal platform and set of 4 platforms (P-02/96, P-2/24, P-05/32, P-02/05)	BS-010216-A11

Optional platforms:		Cat. number
❶ **P-02/96**	For semi-/unskirted PCR plate or 96 microtest tubes 0.2 ml	BS-010216-CK
❷ **P-2/24**	For 24 microtest tubes 1.5–2 ml	BS-010216-AK
❸ **P-05/32**	For 32 microtest tubes 0.5 ml	BS-010216-BK
❹ **P-02/05**	For 24 microtest tubes 0.5 ml and 48 microtest tubes 0.2 ml	BS-010216-DK

❶ Platform **P-02/96**

❷ Platform **P-2/24**

❸ Platform **P-05/32**

❹ Platform **P-02/05**

PSU-2T, Mini–Shaker

DESCRIPTION

Mini–Shaker **PSU-2T** is designed for immunoassays and provides adjustable mixing of reagents in microplates. The device ensures smooth movement of the platform even at low speeds.

Shaker is a compact and user-friendly device. It takes up little space on a desk and is ideal for personal use. Direct drive and brushless motor allow continuous mixing up to 7 days and ensures reliable, trouble-free operation for more than 2 years. Display of the device switches between time and speed readings.

The unit is designed for operation in cold rooms, incubators (excluding CO_2 incubators) and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

Basic Plus
Product Class

Ø 2 mm orbit

Product video is available on the website

SPECIFICATIONS

Speed control range	150–1,200 rpm
Digital time setting	1 min–24 h/non-stop
Digital setting and control of time and speed	
Max. continuous operation time	168 h
Direct drive mechanism	
Orbit	2 mm
Overall dimensions (W×D×H)	220 × 205 × 90 mm
Weight	2 kg
Input current/ power consumption	12 V, 280 mA/3.4 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V

ORDERING INFORMATION: Cat. number

PSU-2T with standard platform **IPP-2** BS-010155-AAG

Optional platforms

IPP-4 BS-010102-AK

Ⓐ Platform IPP-2

Ⓑ Platform IPP-4

Platforms for microtest plates:

Ⓐ **IPP-2** (standard platform) 184 × 132 mm
for 2 microtest plates

Ⓑ **IPP-4** (optional platform) 266 × 170 mm
for 4 microtest plates

Multi Bio RS-24 and Multi RS-60, rotators

DESCRIPTION

Premium
Product Class

Multi Bio RS-24

Product video is available on the website

Premium
Product Class

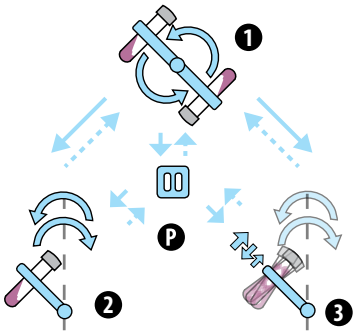
Multi RS-60

Product video is available on the website

Programmable Rotators performs several motion types in one module. Microprocessor control allows performing not only ❶ **Vertical overhead rotation** of the platform, but also ❷ **Reciprocal rotation (rocking motion)** as well as ❸ **Vibration.** These three motion types can be performed separately, pairwise and in cycles, periodically repeating the sequence of three motion types. Multi–Rotation option of Biosan instruments substantially expands possibilities and enhances the efficiency of sample preparation for the examined materials and allows adjusting the mixing procedure according to the individual tasks.

Programmable Rotators can be used for variety of applications in modern life science laboratories: for hybridisation reactions, cell growing, soft extraction and homogenisation of biological components in solutions, as well as for reactions of binding and washing of magnetic particles.

Multi Bio RS-24 and **Multi RS-60** are designed for operation in cold rooms, incubators (excluding CO_2 incubators) and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40 °C. Low voltage external power supply (12 V / 24V) provides electrical safety in a humid environment.



It is possible to choose the position of tubes for rocking motion – horizontal or vertical. The platform does not make an additional revolution before stopping in the horizontal plane.

Programmable Rotator provides 3 rotation types and Pause:

❶ Vertical overhead rotation

❷ Reciprocal rotation (rocking motion)

❸ Vibro

Ⓟ Pause

Description and pictures of all platforms can be found on page 29

Multi Bio RS-24 and Multi RS-60, rotator

SPECIFICATIONS

	Multi Bio RS-24	Multi RS-60
❶ Vertical overhead rotation:		
Speed control range	1–100 rpm (increment 1 rpm)	
Vertical rotation movement	360°	
Time setting range	0–250 s	
❷ Reciprocal rotation (rocking motion):		
Speed control range	1–100 rpm (increment 1 rpm)	
Tilt angle range	1–90° (increment 1°)	
Time setting range	0–250 s	
❸ Vibro:		
Tilt angle range	0–5° (increment 1°)	
Pause/Vibro time setting range	0–5 s	
GENERAL SPECIFICATIONS:		
Digital time setting	1 min–24 h/non-stop (increment 1 min)	
Timer sound signal	yes	
Maximum load	0.5 kg	0.8 kg
Overall dimensions (W × D × H)	365 × 195 × 155 mm	430 × 230 × 230 mm
Weight	1.7 kg	3.8 kg
Input current/power consumption	12 V, 660 mA/8 W	24 V, 750 mA/18 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V	Input AC 100–240 V, 50/60 Hz; Output DC 24 V

Multi Bio RS-24 with optional platform PRSC-22

Multi RS-60 with standard platform PRS-48

ORDERING INFORMATION:	Cat. number
Multi Bio RS-24 with standard platform **PRS-26**	BS-010117-AAG
Multi RS-60 with standard platform **PRS-48**	BS-010118-AAI
Optional platforms for Multi Bio RS-24:	
PRS-5/12	BS-010117-HK
PRS-10	BS-010117-IK
PRSC-22	BS-010117-LK
PRSC-10	BS-010117-JK
PRS-1DP	BS-010149-DK
M-8/50	BS-010117-PK
Optional platforms for Multi RS-60:	
PRS-8/22	BS-010118-AK
PRS-14	BS-010118-BK

Description and pictures of all platforms can be found on page 29

Platforms for Multi Bio RS-24

Standard:	Capacity	Tube Volume	Tube Diameter	Cat. number
❶ **PRS-26**	26	1.5–15 ml	10–16 mm	BS-010117-GK
Optional				
❷ **PRS-5/12**	5 and 12	up to 50 and 1.5–15 ml	20–30 and 10–16 mm	BS-010117-HK
❸ **PRS-10**	10	up to 50 ml	20–30 mm	BS-010117-IK
❹ **PRSC-22**	22	15 ml	16 mm	BS-010117-LK
❺ **PRSC-10**	10	50 ml	25–30 mm	BS-010117-JK
❻ **M-8/50**	8	50 ml	25–30 mm	BS-010117-PK
❼ **PRS-1DP**	Platform for microplates and racks for tall tubes 0.5 and 1 ml (e.g. Thermo 3741MTX, 3742MTX, 3744MTX)			BS-010149-DK

❶ PRS-26

❷ PRS-5/12

❸ PRS-10

❹ PRSC-22

❺ PRSC-10

❻ M-8/50

❼ PRS-1DP

Clamps on PRSC-10

PRS series platforms are equipped with universal rubber clamps for different size tube fixation;
PRSC series platforms have metal clamps able to hold heavier solutions (e.g. soil, sand).

Platforms for Multi RS-60

Standard:	Capacity	Tube Volume	Tube Diameter	Cat. number
❶ **PRS-48**	48	1.5–15 ml	10–16 mm	BS-010118-CK
Optional:				
❷ **PRS-8/22**	8 and 22	up to 50 and 1.5–15 ml	20–30 and 10–16 mm	BS-010118-AK
❸ **PRS-14**	14	up to 50 ml	20–30 mm	BS-010118-BK

❶ PRS-48

❷ PRS-8/22

❸ PRS-14

Bio RS-24, Mini–Rotator

DESCRIPTION

Mini-rotator **Bio RS-24** provides vertical rotation of the platform. The rotator is an ideal instrument for preventing blood coagulation in tubes and fulfilling of procedures of biological components extraction.

The device is simple to operate; it is designed as a low-cost solution.

The unit is designed for operation in cold rooms, incubators (excluding CO_2 incubators) and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C. Low voltage external power supply (12 V) provides electrical safety in a humidenvironment.

Basic Plus
Product Class

Vertical rotation 360°

Bio RS-24 in operation

SPECIFICATIONS

Speed control range	5–30 rpm
Vertical rotation movement	overhead, 360°
Digital time setting	1 min–24 h/non-stop (increment 1 min)
Timer sound signal	yes
Maximum continuous operation time	8 h
Overall dimensions (W×D×H)	325 × 190 × 155 mm
Weight	1.4 kg
Recommended load	75% of the rated volume
Input current/power consumption	12 V, 110 mA/1.3 W
External power supply	Input AC 100–240 V 50/60 Hz; Output DC 12 V

PRS series platforms are equipped with universal rubber clamps for different size tube fixation;

PRSC series platforms have metal clamps able to hold heavier solutions (e.g. soil, sand).

ORDERING INFORMATION: Cat. number

Bio RS-24	
with standard platform **PRS-22**	BS-010133-AAG
Optional platforms:	
PRS-4/12	BS-010117-AK
PRSC-18	BS-010117-EK

Platform	Capacity	Tube Volume	Tube Diameter, Ø
❶ **PRS-22** (standard)	22	1.5–15 ml	10–16 mm
❷ **PRS-4/12** (optional)	4 and 12	up to 50 and 1.5–15 ml	20–30 mm and 10–16 mm
❸ **PRSC-18** (optional)	18	15 ml	16 mm

❶ PRS-22

❷ PRS-4/12

❸ PRSC-18

V-1 plus and V-32, Vortexes

DESCRIPTION

Basic Plus
Product Class

Ø 4 mm orbit

Vortex

V-1 plus vortex and **V-32** multi vortex are intended for intensive mixing of samples in tubes with an eccentric mechanism.

Vortex can be used for different operations:

- Mixing tissue samples;
- Suspending cell samples;
- Mixing chemical samples;
- Mixing bacterial and yeast cells when washing from the culture medium;
- Extracting metabolites and enzymes from cells and cell cultures, etc.

Vortex can be used to perform various DNA/RNA operations, such as purification of low-molecular DNA/RNA fragments in PCR-diagnostics.

Vortex is applicable in all the fields of laboratory research in biotechnology, microbiology and medicine.

Vortexes have two operation modes:

- Continuous operation;
- Impulse operation. (**V1 plus** pressure activated)

Model **V-1 plus** is a personal vortex with a fluoroplastic head for single tube vortexing.

Model **V-32** is a universal vortex multipurpose device with different accessories. It is supplied with a 32-socket universal platform PV-32 for Eppendorf type tubes up to 1,5 ml (1.5/0.5/0.2 ml–16/8/8 sockets) and a PL-1 head for vortexing a single tube up to 50 ml. An optional 6-socket platform PV-6/10 for 10 ml tubes (maximum tube diameter 15 mm) or a platform PV-48 for six strips of eight 0.2 ml microtubes can be supplied on request.

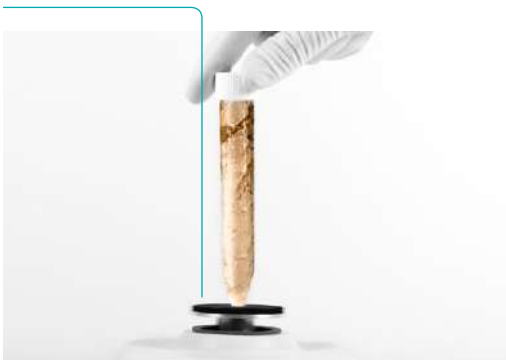
Basic Plus
Product Class

Ø 2 mm orbit

Vortex

Product video is available on the website

Platform PL-1 for V-32



V-1 plus and **V-32,** Vortexes

SPECIFICATIONS

	V-1 plus	V-32
Mixing principle	Vibro Eccentric	
Speed control range	500–3,000 rpm	
Acceleration time	<1 s	3 s
Maximum continuous operation time	24 h	
Timer sound signal	—	
Mixing module for tubes	from 0.2 to 50 ml	from 0.2 to 10 ml
Maximum mixing volume	30 ml	45 ml
Maximum load	30 g	70 g
Orbit	4 mm	2 mm
Dimensions (W×D×H)	90 × 150 × 80 mm	120 × 180 × 100 mm
Weight	0.8 kg	1.5 kg
Input current/power consumption	12 V, 320 mA/3.8 W	
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V	

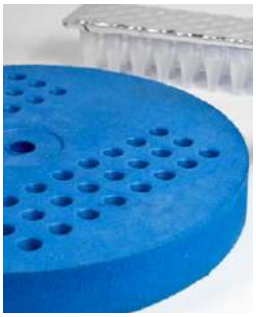
V-1 Plus

V-1 Plus

V-1 Plus

Platform PV-6/10 for V-32

Platform PV-48 for V-32



V-32 with platform PV-48

ORDERING INFORMATION:

	Cat. number
V-1 plus	BS-010203-AAG
V-32 with standard platforms **PL-1** and **PV-32**	BS-010207-AAG
Optional platforms for V-32:	
PV-6/10 platform for 6–10 ml tubes (max. Ø 15 mm)	BS-010207-BK
PV-48, platform for 6–8 × 0.2ml strips or 48 tubes of 0.2 ml	BS-010207-GK

MSV-3500, Multi Speed Vortex

Basic Plus
Product Class

MSV-3500 with platform SV-8/15

Vortex

Product video is available on the website

DESCRIPTION

Multi Speed Vortex **MSV-3500** is designed for soft or intensive mixing of reagents in different size and type plastic tubes (0.2 to 50 ml).

It is designed for operation in life science laboratories working in biochemistry, cell and molecular biology.

Unit has four types of interchangeable platforms: for Eppendorf type microtest tubes, 10/15/50 ml tubes (diameter 12/16/30 mm). Platforms can be ordered separately or as one set with **MSV-3500**.

Speed and time are under microprocessor control. LCD display indicates two lines of values: the set and actual values of speed and time.

Unit provides high maximum speed of platform rotation efficiently mixing microvolumes (less than 5 µl) of samples.

SPECIFICATIONS

Speed control range	300–3,500* rpm
Digital time setting	0–60 min/non-stop (increment 1 min)
Timer sound signal	yes
Display	LCD, 2 × 16 signs
Orbit	4 mm
Maximum load	0.2 kg
Maximum continuous operation time	8 h
Dimensions (W×D×H)	180 × 170 × 145 mm
Weight	2.6 kg
Input current/power consumption	12 V, 1 A / 12 W
External power supply	Input AC 100–240 V, 50/60 Hz, Output DC 12 V

* — Maximum speed depends on load

ORDERING INFORMATION:

	Cat. number
MSV-3500 with all platforms	BS-010210-TAH
MSV-3500 without platform	BS-010210-AAH

Optional platforms:		Cat. number
❶ **SV-16/8**	Platform for 16 × 1.5 ml + 8 × 0.5 ml + 8 × 0.2 ml microtubes, Ø 11/8/6 mm	BS-010210-CK
❷ **SV-10/10**	Platform for 10 × 10 ml tubes 12 mm diameter	BS-010210-BK
❸ **SV-8/15**	Platform for 8 × 15 ml tubes 16 mm diameter	BS-010210-DK
❹ **SV-4/30**	Platform for 4 × 50 ml tubes 30 mm diameter	BS-010210-AK

❶ SV-16/8

❷ SV-10/10

❸ SV-8/15

❹ SV-4/30

RCP-24, Homogenizer ANNOUNCEMENT

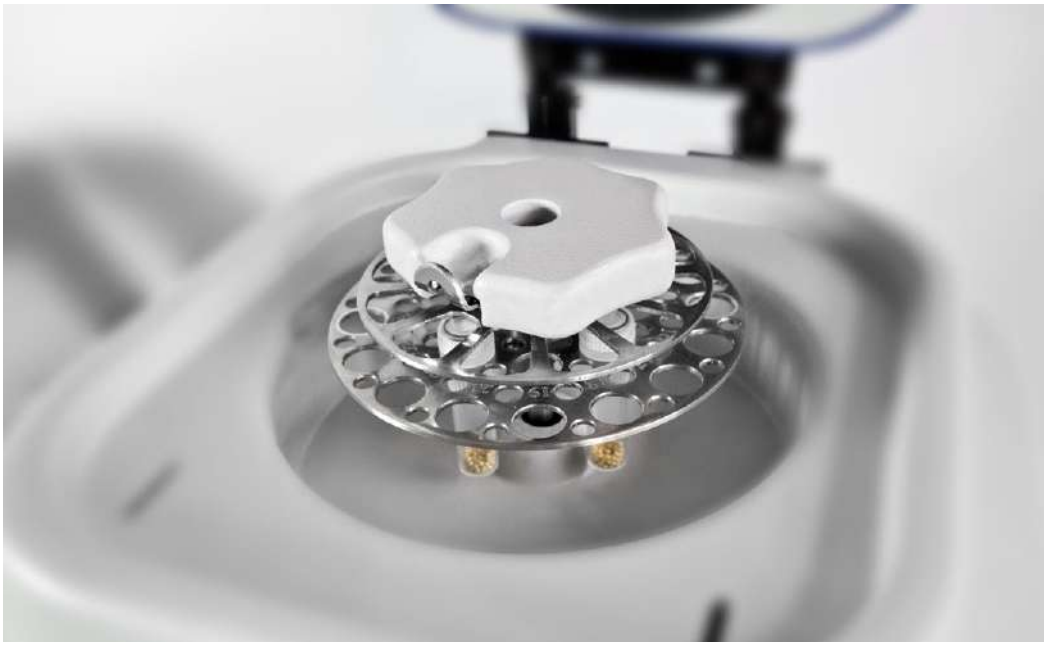
DESCRIPTION

Reciprocal Homogenizer **RCP-24,** a bench-top mechanical device designed for mixing, grinding, homogenizing and emulsifying biological objects in microtubes by vigorously mixing by reciprocal motion with various beads for sample preparation for subsequent academic, pharmaceutical, biotechnological or biomedical studies.

Homogenizer facilitates the formation of a supernatant containing nucleic acids and proteins suitable for subsequent purification, extraction or analysis. The device is optimized for extracting proteins, DNA, RNA or tRNA from various tissue sources, but it can also be used for other applications. **RCP-24** performs efficient homogenization of mammalian tissue, plant tissue or other biomaterials.

SPECIFICATIONS

Test tubes capacity	up to 24
Test tubes	2 ml
Speed control range	100–2,000 rpm (increment 100 rpm)
Digital time setting	1–15 min (increment 1 min)
Oscillation amplitude	44 mm, vertical
Dimension (W×D×H)	285 × 400 × 440 mm
Input current / power consumption	230 V, 50 Hz/ 220 W (1.3 A)
Weight	19.1 kg



THERMO–SHAKERS

PST-60HL

Plate Shaker-Thermostat

TS-100C

Thermo-Shaker with cooling for microtubes and PCR plates

TS-DW

Thermo–Shaker for Deep Well Plates

Catalogue 2021

PST-60HL, PST-60HL-4 and PST-100HL, Thermo–Shakers

DESCRIPTION

PST-60HL, PST-60HL-4 and **PST-100HL** Thermo-shakers are designed for shaking standard 96-well microtiter plates in the thermal regulation mode. Models **PST-60HL** and **PST-100HL** hold 2 plates, model **PST-60HL-4** has four plates.

A multisystem principle used in design of the Thermo–Shaker, allows operating it as three independent devices:

- Incubator;
- Microplate shaker;
- Thermo–Shaker.

A distinctive feature of Biosan Plate Thermo–Shakers is patented by the company **Two-Side Microplates Heating**, which allows achieving full correspondence of the set and actual temperature in the microplate wells.

Standard versions of Thermo-shakers provide heating up to 60°C, sufficient for carrying out ELISA tests.

Thermo-shaker **PST-100HL** with the ability to stabilize the temperature up to 100°C is specially designed for hybridisation reactions.

Plate Thermo–Shakers provide:

- Soft or intensive sample shaking;
- Rotation speed regulation, stabilization and indication
- Even rotation amplitude throughout the Thermo Automatic
- Setting and indication of the required temperature on the platform
- Automatic fault diagnostics (temperature sensor, platform heating, lid heating etc.)
- With the help of the temperature calibration function, the user can calibrate the unit to compensate for differences in the thermal behaviou of plates from different manufacturers; **(PST-60HL, PST-60HL-4).**

Application fields:

PST shakers can be used in various applications such as:

- **Immunochemistry** — Enzyme-Linked Immuno Sorbent Assay (ELISA). Unique bottom and top heating, while shaking, ensures the most efficient linkage of the target, thus providing the most reliable results;
- **Molecular biology** — Micro and Macro array applications — incubation with shaking provides more efficient hybridization of target nucleic acid with on the surface of Micro and Macro chip printed probes **(Specific holder is required)**

Premium Product Class

Ø 2 mm orbit

Product video is available on the website

Premium Product Class

Ø 2 mm orbit

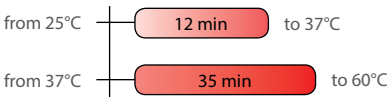
Premium Product Class

Ø 2 mm orbit

PST-60HL, PST-60HL-4 and PST-100HL, Thermo–Shakers

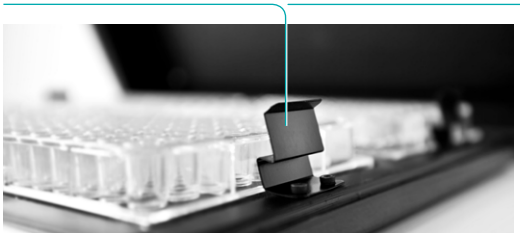
	PST-60HL	PST-60HL-4	PST-100HL
Temperature setting range	+25°C... +60°C		+25°C... +100°C
Temperature control range	+5°C above ambient... +60°C		+5°C above ambient... +100°C
Temperature setting resolution	0.1°C		
Temperature stability	±0.1°C		
Temperature uniformity @ +37°C	±0.25°C		±0.2°C
Temperature calibration coefficient range	0.936–1.063 (±0.063)		—
Heating	Two-side microplate heating (platform and lid)		Two-side microplate heating (platform and lid) + double heating contour of the platform
Orbit	2 mm		
Speed regulation range	250–1,200 rpm (increment 10 rpm)		
Digital time setting	1 min–96 h/non-stop (increment 1 min)		
Timer sound signal	yes		
Display	LCD, 2 × 16 signs		
Max. height of microtest plate	18 mm		
Number of microtest plates	2	4	2
Weight	6.1 kg	8.8 kg	5.9 kg
Platform dimensions (W×D)	250 × 150 mm	290 × 210 mm	250 × 150 mm
Overall dimensions (W×D×H)	270 × 260 × 125 mm	380 × 390 × 140 mm	270 × 260 × 125 mm
Input current/power consumption	12 V DC, 3.3 A/40 W	12 V DC, 4.15 A/50 W	12 V, 5 A/60 W
External power supply	Input AC 100–240 V 50/60 Hz, Output DC 12 V		

Heat up time **PST-60HL** and **PST-60HL-4:**



Heat up time **PST-100HL:**

PST-60HL-4 spring holders



ORDERING INFORMATION:

	Cat. number
PST-60HL	BS-010119-AAI
PST-60HL-4	BS-010128-AAI
PST-100HL	BS-010142-AAI

TS-100, TS-100C, and TS-100C Smart Thermo-Shakers

DESCRIPTION

TS-100 and **TS-100C** thermo-shakers are designed for intensive mixing of samples in microtest tubes or PCR plates in a temperature control environment. The **TS-100C** model of thermo-shaker differs from **TS-100** in the possibility of cooling samples down to +4°C.

Features of thermo-shakers meet the highest expectations of users according to many parameters:

- Fast reaching of specified mixing speed and maintenance of equal amplitude of rotation throughout the thermo-shaker block;
- Stability of maintaining the set temperature in a wide range throughout the block surface of thermo-shakers;
- With the help of the temperature calibration function, the user can calibrate the unit approximately ±6% of the selected temperature to compensate differences in the thermal behaviour of tubes from different manufacturers;
- LCD display indicates pre-set and current values of temperature, speed and time of operation;
- Quiet motor operation, compact size, prolonged service life.

Functions of heating and mixing can be performed either simultaneously or independently, which allows using the unit as three independent devices:

- **Thermostat;**
- **Shaker;**
- **Thermo–shaker.**

We offer five heating and cooling blocks for each model, including a block with a plastic lid for PCR-plates. Within one model of thermo-shaker, the blocks are mutually interchangeable and can be easily installed.

Premium
Product Class

Ø 2 mm orbit

TS-100

Premium
Product Class

Ø 2 mm orbit

TS-100C

Mixing Efficiency Video is available on the website

Product video is available on the website

NEW

The new model allows you to control the device in the following modes:

1. Manual using the front panel interface.
2. Through a computer program using Bluetooth® technology.
   The software allows you to manage following parameters:
   - Rotation speed
   - Temperature
   - Time
   - Sound signal
   - Creating Profiling programs using controlled parameters
   - Visualization of temperature vs time and speed vs time graphs
   - Data export to Excel and CSV formats
   - Error messages/Fault diagnostics

Possibility of control up to seven units from PC. Independent parameter setting allows performing different tasks simultaneously on several units.

Smart Plus
Product Class

Ø 2 mm orbit

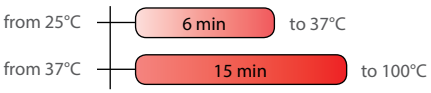
TS-100C Smart

Bluetooth® connection

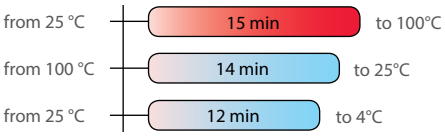
TS-100, TS-100C, and TS-100C Smart Thermo-Shakers

	TS-100	TS-100C, TS-100C Smart
Temperature setting range	+25°C ... +100°C	+4°C ... +100°C
Temperature control range	5°C above ambient ... +100°C	15°C below ambient ... +100°C
Temperature setting resolution	0.1°C	
Temperature stability	±0.1°C	
Temperature accuracy @ +37°C	±0.5°C	
Average heating speed:	4°C/min from +25°C to +100°C	5°C/min from +25°C to +100°C
Average cooling speed:	—	from +100°C to +25°C 5°C/min from +25°C to +4°C 1.8°C/min
Temperature uniformity over the block:	@ +37°C ±0.1°C @ +60°C ±0.2°C @ +100°C ±0.2°C	@ +4°C ±0.6°C @ +37°C ±0.1°C @ +100°C ±0.3°C
Temperature calibration coefficient range	0.936–1.063 (±0.063)	
Speed control range	250–1,400 rpm	
Acceleration time	3 s	
Orbit	2 mm	
Display	LCD, 2 × 16 signs	
Microprocessor controlled temperature, mixing speed and operation time		
Digital time setting	1 min–96 h (1 min increment)	
Timer sound signal	yes	
Maximum continuous operation time	96 h	
Overall dimensions (W×D×H)	220 × 240 × 130 mm	
Weight	3.7 kg	
Input current/power consumption	12 V, 3.5 A/42 W	12 V, 4.9 A/60 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V	
PC software	—	only for TS-100C Smart

Heat up times for **TS-100:**



Heat up and cool down times for **TS-100C** and **TS-100C Smart:**



Thermo-Shakers are capable to support various application such as:

- **Molecular diagnostics** — Sample lysis for further Nucleic acid automated or manual extraction;
- **Genetic** — Amplicon denaturation for NGS Library preparation;
- **Biochemistry** — Enzymatic reaction;
- **Genomics** — Protein degradation studies;
- **Cellular biology** — Extraction of metabolites from cellular material.

ORDERING INFORMATION:

	Cat. number
TS-100 without block	BS-010120-AAI
TS-100C without block	BS-010143-AAI
TS-100C Smart with software, without block	BS-010171-A01

Photos and descriptions of all blocks can be found on next page

Interchangeable Blocks for **TS-100**

Optional Blocks:		Tube's volume	Cat. number
1 **SC-18**	20 and 12 microtubes	0.5 ml and 1.5 ml	BS-010120-AK
2 **SC-18/02**	20 and 12 microtubes	0.2 ml and 1.5 ml	BS-010120-CK
3 **SC-24**	24 microtubes	2 ml	BS-010120-EK
4 **SC-24N**	24 microtubes	1.5 ml	BS-010120-GK
5 **SC-96A**	96-well unskirted or semi-skirted microplate (0.2 ml) for PCR		BS-010120-FK

1 SC-18

2 SC-18/02

3 SC-24

4 SC-24N

5 SC-96A

Interchangeable Blocks for **TS-100C** and **TS-100C Smart**

Optional Blocks:		Tube's volume	Cat. number
1 **SC-18C**	20 and 12 microtubes	0.5 ml and 1.5 ml	BS-010143-AK
2 **SC-18/02C**	20 and 12 microtubes	0.2 ml and 1.5 ml	BS-010143-CK
3 **SC-24C**	24 microtubes	2 ml	BS-010143-EK
4 **SC-24NC**	24 microtubes	1.5 ml	BS-010143-GK
5 **SC-96AC**	96-well unskirted or semi-skirted microplate (0.2 ml) for PCR		BS-010143-FK

1 SC-18C

2 SC-18/02C

3 SC-24C

4 SC-24NC

5 SC-96AC

TS-DW, Thermo-Shaker for deep well plates

Product video is available on the website

Deep Well Plate Thermo-Shaker provides:

- Soft or intensive sample shaking;
- Rotation speed regulation, stabilisation and indication;
- Even rotation amplitude throughout the Thermo-Shaker platform;
- Exceptional temperature uniformity across the plate;
- Required operation time setting and indication;
- Automatic stopping of the platform movement after expiration of the set time;
- Setting and indication of the required temperature on the platform;
- A variety of changeable blocks that can accommodate most popular deepwell plates;
- Automatic fault diagnostics (temperature sensor, platform heating, lid heating etc.).

Separate blocks to accommodate different deepwell plates will be released. For example:

- Deep Well Plates NUNC® 96/2,000 µl
- Deep Well Plates Eppendorf® 96/0.5 ml

Application fields:

- **Cytochemistry** — for *in situ* reactions;
- **Immunochemistry** — for immunofermentative reactions;
- **Biochemistry** — for enzyme and protein analysis;
- **Molecular biology** — for nucleic acid extraction.

DESCRIPTION

TS-DW Thermo-Shaker is designed for shaking and incubating deep well plates.

A multisystem principle, used in the Thermo-Shaker design, allows operating it as three independent devices: Incubator, Plate shaker and Thermo-Shaker.

TS-DW provides excellent temperature uniformity across the plate due to patented two-sided heating of the block and the lid, contour heating of the block and close proximity of heating elements to plate walls.

There is a number of interchangeable blocks to suit different plates such as Eppendorf® 96/1,000 µl, Sarstedt® Megablock 96/2,200 µl, Porvair® 96/2,000 µl, Axygen® 96/2,200 µl. Also, we can manufacture a customized block on request.

1 Block B-2E

The block for deepwell plate is mountable, thus a custom plate module can be manufactured on request

SPECIFICATIONS

Temperature setting range	+25 °C ... +100 °C
Temperature control range	5 °C above ambient ... +100 °C
Temperature setting resolution	0.1°C
Temperature uniformity @ +37 °C	±0.1 °C*
Temperature accuracy @ +37 °C	±0.5 °C*
Temperature calibration coefficient range	0.936–1.063 (±0.063)
Time of platform heating from +25 °C to +37 °C	6 min*
Speed control range	250–1,400 rpm
Orbit	2 mm
Display	LCD, 2 × 16 signs
Digital time setting	1 min–96 h (1 min increment)
Timer sound signal	yes
Overall dimensions (W×D×H)	240 × 260 × 160 mm
Weight	5.1 kg
Input current/power consumption	12 V, 4.8 A/58 W
External power supply	Input AC 100–240 V 50/60 Hz; Output DC 12 V

* — For B-2E block

ORDERING INFORMATION:	Cat. number
TS-DW without block	BS-010159-A02

Interchangeable Blocks:			Cat. number
1	**B-2E**	Block for one deep-well plate Eppendorf® 96/1,000 µl	BS-010159-AK
2	**B-2S**	Block for one deep-well plate Sarstedt® Megablock 96/2,200 µl	BS-010159-CK
3	**B-2P**	Block for one deep-well plate Porvair® 96/2,000 µl	BS-010159-EK
4	**B-2A**	Block for one deep-well plate Axygen® 96/2,200 µl	BS-010159-FK
5	**B-06A**	Block for one deep-well plate Axygen® 96/600 µl	BS-010159-KK
	—	Please, enquire about blocks for other plates	

MINICENTRIFUGES-VORTEXES, MINI-CENTRIFUGE, CENTRIFUGES

FVL-2400N

Mini-Centrifuge/Vortex

MSC-6000

Centrifuge/Vortex Multispin

CVP-2

Centrifuge/Vortex for PCR plates

Catalogue 2021

FV-2400, Microspin and FVL-2400N, Combi-Spin

DESCRIPTION

Minicentrifuges-Vortexes Microspin **FV-2400** and Combi-Spin **FVL-2400N** is specially designed for genetic engineering research (for PCR-diagnostics experiments). Units can be used in biomedical and biotechnological laboratories.

Minicentrifuges-Vortexes provide simultaneous mixing and separation of 12 samples, using centrifuge and mixing modules located on the common spin–module. Sequential combination of these operations allows you to collect all material at the bottom of the tube.

FV-2400 is an "open type" centrifuge (without lid), that increases the speed of centrifugation and resuspension operations.

FVL-2400N has a bioform design and equipped with a transparent protective lid accompanied by a protection mechanism that stops the rotor motion when the lid is opened.

Basic Plus
Product Class

Rotor R-1.5

Basic Plus
Product Class

Product video is available on the website

SPECIFICATIONS

	FV-2400	FVL-2400N	FV-2400	FVL-2400N
Rotation speed (fixed)	2,800 rpm		3,500 rpm	
Max. RCF	500 × *g*		700 × *g*	
Continuous and impulse operation modes				
Safety		Stop at open lid		Stop at open lid
Overall dimensions (W×D×H)	120 × 170 × 120 mm	190 × 235 × 125 mm	120 × 170 × 120 mm	190 × 235 × 125 mm
Weight	1.4 kg	1.7 kg	1.4 kg	1.7 kg
Nominal operating voltage	230 V, 50 Hz	230 V, 50 Hz	120 V, 60 Hz	120 V, 60 Hz
Power consumption (120 / 230 V)	30 W (0.13 A)		30 W (0.27 A)	

Rotors for **FV-2400** and **FVL-2400N**

ORDERING INFORMATION:	Cat. number
FV-2400 white with standard rotor **R-1.5M** and **R-0.5/0.2M**	BS-010201-AAA
FVL-2400N with standard rotors **R-1.5** and **R-0.5/0.2**	BS-010202-AAA

Optional rotors: see table below

Rotors for FV-2400:		Capacity	Type	Cat. number
1 **R-0.5/0.2M**	12 × 0.5 ml and 12 × 0.2 ml microtubes	24	Standard	BS-010201-BK
2 **R-1.5M**	12 × 1.5/2 ml microtubes	12	Standard	BS-010201-AK
3 **R-2/0.5**	8 × 1.5/2 ml and 8 × 0.5 ml microtubes	16	Optional	BS-010205-CK
4 **R-2/0.5/0.2**	6 × 1.5/2 ml. 6 × 0.5 ml and 6 × 0.2 ml microtubes	18	Optional	BS-010205-DK
5 **SR-16**	Two 8-section strips for 0.2 ml microtubes	16	Optional	BS-010202-AK
6 **SR-64***	Eight 8-section strips for 0.2 ml microtubes	64	Optional	BS-010201-EK

* — For any type of strips including paired

1 R-0.5/0.2M

2 R-1.5M

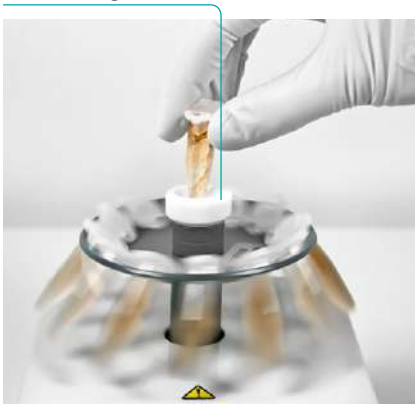
3 R-2/0.5

4 R-2/0.5/0.2

5 SR-16

6 SR-64

Tube vortexing on FV-2400

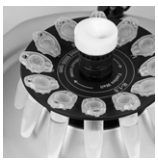


Rotators for FVL-2400N:		Capacity	Type	Cat. number
1 **R-0.5/0.2**	12 × 0.5 ml and 12 × 0.2 ml microtubes	24	Standard	BS-010205-BK
2 **R-1.5**	12 × 1.5/2 ml microtubes	12	Standard	BS-010205-AK
3 **R-2/0.5**	8 × 1.5/2 ml and 8 × 0.5 ml microtubes	16	Optional	BS-010205-CK
4 **R-2/0.5/0.2**	6 × 1.5/2 ml. 6 × 0.5 ml and 6 × 0.2 ml microtubes	18	Optional	BS-010205-DK
5 **SR-16**	Two 8-section strips for 0.2 ml microtubes	16	Optional	BS-010202-AK
6 **SR-32***	Four 8-section strips for 0.2 ml microtubes	32	Optional	BS-010205-FK

* — Not compatible with Combi-Spins produced before 2015

1 R-0.5/0.2

2 R-1.5



3 R-2/0.5

4 R-2/0.5/0.2

5 SR-16

6 SR-32

MSC-3000 and MSC-6000, Multi-Spins

DESCRIPTION

Centrifuge/vortex Multi-Spins **MSC-3000** and **MSC-6000** are products of extensively evolving Spin-mix-Spin technology that is intended for collecting micro volumes of reagents on the microtube's bottom (first centrifugation spin), following mixing (mix) and collecting the reagents again from the walls and cap of the microtube (second spin). Aim of this repetitive algorithm of operation is to reduce the mistakes during sample preparation for PCR analysis. We named it "sms-algorithm".

Multi–Spin is a fully automatic device for reproducing sms–algorithm for 12 tubes at one time, thus saving time considerably. A must-have instrument for PCR and DNA analyses laboratory.

Multi Spin is four devices combined in one:

1. Centrifuge — Maximum RCF:
MSC-3000: up to 800 × *g*
MSC-6000: up to 2,350 × *g*

2. Vortex (3 mixing modes — **soft, medium, hard**; regulated time; Vortexing regulation timer 1–20 s)

3. Centrifuge/Vortex;

4. SMS–cycler for realisation of the "sms–algorithm".

Premium
Product Class

Premium
Product Class

Both product videos are available on the website

Saving time with multi-spin
Multi–Spin allows considerable time saving compared to Combi-Spin by automatically performing a cycling program of sample mixing and spinning according to the set spin–mix–spin cycle for 12 microtubes simultaneously.

	FVL-2400N	MSC-3000	MSC-6000
Speed control max.	2,800 rpm	3,500 rpm	6,000 rpm
RCF max.	500 × *g*	800 × *g*	2,350 × *g*
Number of tubes vortexing	1 individually	12 simultaneously	
Time for completing "spin-mix-spin" cycle:			
for 2 microtubes	60 s	25 s	15 s
for 12 microtubes	5–6 min	90 s	60 s
for 100 microtubes	60 min	15 min	10 min
Unit price ratio	1 ×	1.5 ×	1.6 ×

MSC-3000 and MSC-6000, Multi–Spins

SPECIFICATIONS

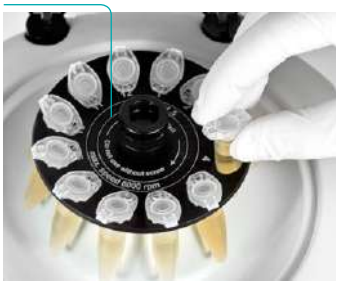
	MSC-3000	MSC-6000
Speed regulation range (increment 100 rpm)	1,000–3,500 rpm	1,000–6,000 rpm
RCF max.	800×*g*	2,350×*g*
Spin timer	1 s–99 min	1 s–30 min
Timer sound signal	yes	
Vortexing intensity	Soft, medium, hard	
Vortexing time	0–20 s (increment 1 s)	
SMS–cycle regulation	1–999 cycles	
Display	LCD, 2×16 signs	
Safety	Autostop at open lid	Lid lock
Overall dimensions (W×D×H)	190×235×125 mm	
Weight	2.1 kg	2.5 kg
Input current/power consumption	12 V, 11 W (0.9 A)	24 V, 24 W (1 A)
External power supply	Input AC 100–240 V 50/60 Hz; Output DC 12 V	Input AC 100–240 V 50/60 Hz; Output DC 24 V

ORDERING INFORMATION:

	Cat. number
MSC-3000 with standard rotors **R-1.5, R-0.5/0.2**	BS-010205-AAN
MSC-6000 with standard rotors **R-1.5, R-0.5/0.2**	BS-010211-AAL

Optional rotors: see table below

Rotor R-1.5



MSC-3000 MSC-6000

Optional rotors:		Capacity	Type	Cat. number
1 **R-0.5/0.2**	12×0.5 ml and 12×0.2 ml microtubes	24	Standard	BS-010205-BK
2 **R-1.5**	12×1.5/2 ml microtubes	12	Standard	BS-010205-AK
3 **R-2/0.5**	8×1.5/2 ml and 8×0.5 ml microtubes	16	Optional	BS-010205-CK
4 **R-2/0.5/0.2**	6×1.5/2 ml, 6×0.5 ml and 6×0.2 ml microtubes	18	Optional	BS-010205-DK
5 **SR-16**	Two 8-section strips for 0.2 ml microtubes	16	Optional	BS-010202-AK
6 **SR-32***	Four 8-section strips for 0.2 ml microtubes	32	Optional	BS-010205-FK

* — Not compatible with Multi-Spins produced before 2015

1 R-0.5/0.2

2 R-1.5

3 R-2/0.5

4 R-2/0.5/0.2

5 SR-16

6 SR-32

CVP-2, Centrifuge vortex for PCR plates

DESCRIPTION

After many years of Combined Centrifuge/Vortex concept success, we are proud to introduce the long-awaited Centrifuge vortex for PCR plates, **CVP-2**, to the sample preparation market. The Spin–Mix–Spin technology is intended to spin-down micro volumes of reagents on the well's bottom (first centrifugation spin), following mixing (mix) and spin-down the reagents again from the walls and cap of the well (second spin). Aim of this repetitive algorithm of operation is to reduce the mistakes during sample preparation for PCR analysis.

CVP-2 is a fully automatic device for reproducing sms–algorithm for 2 PCR plates at the same time, thus saving time considerably. A must-have instrument for PCR and DNA analyses laboratory.

CVP-2 is 4 devices combined in 1:

1. Centrifuge — Maximum RCF: 245 × g (1,500 rpm)
2. Vortex (300–1,200 rpm; Vortexing regulation timer 0–60 sec)
3. Centrifuge vortex
4. SMS–cycler for realization of the "sms–algorithm"

Tested plate types for use with CVP-2 centrifuge:

- Full-skirted 96-well standard micro-plates (without adapter)
- Half-skirted 96-well standard micro-plates (with adapter AP-96)
- Unskirted 96-wel standard l micro-plates (with adapter AP-96)
- Applied Biosystems™ MicroAmp™ Optical 96-well reaction plate (with adapter AP-96)
- Applied Biosystems™ MicroAmp™ Optical 384-well reaction plate (with adapter AP-384)
- For specific plate usage, please contact us for evaluation.

Premium
Product Class

Product video is available on the website

SPECIFICATIONS

Speed regulation range	300–1,500 rpm
Min. RCF at 1,500 rpm	175 × g
Vortex regulation range	300–1,200 rpm
Setting resolution	100 rpm
Plate type:	
• Without adapter:	96-well skirted PCR plates, PCR strips in a frame;
• With adapter **AP-96:**	96-well semi-skirted and non-skirted PCR plates;
• With adapter **AP-384:**	384-well PCR plates;
Display	LCD, 2 × 16 signs
Centrifugation mode time range	0–30 min
Centrifugation mode time increment	1 s; after 1 min–1 min
Vortex mode time range	0–60 s
Timer sound signal	yes
Number of programmable cycles	1–999
Chamber diameter	210 mm
Overall dimensions (W×D×H)	285 × 350 × 190 mm
Weight	6.15 kg
Input current/power consumption	12V,1.5 A/18 W
External power supply	Input AC 100–240 V 50/60 Hz; Output DC 12 V

ORDERING INFORMATION — Cat. number

CVP-2 — BS-010219-A02

With rotor for two PCR plates, protection lid and adapters AP-96* (a set of 2 adapters for 96-well semi-skirted and unskirted PCR plates)

Optional accessories:

AP-384* — BS-010219-EK

A set of 2 adapters for 384-well PCR plates

* — Adapters are made of Ertacetal® C and are autoclavable

High-speed Mini-centrifuge **Microspin 12**

Basic Plus
Product Class

Protection lid

Product video is available on the website

❶ A-02 Adapters

❷ A-05 Adapters

DESCRIPTION

High-speed Mini-centrifuge **Microspin 12** is a compact desktop centrifuge designed for biomedical laboratories.

Microspin 12 is used to extract RNA/DNA samples, sedimentation of biological components, biochemical and chemical analysis of microsamples.

A display simultaneously shows actual and set values for:

1. Centrifugation time;

2. Set and actual speed values;

3. Relative centrifugal force.

A brushless motor provides noiseless performance at maximal speed and long service life. An angular rotor is designed to accomodate 12 Eppendorf microtubes and spin columns (autoclavable adapters for 0.2, 0.5 ml tubes included). The rotor is made of aluminium, it is equipped with a fixing lid and included in the standard specification of the centrifuge. Constant airflow around the rotor reduces the risk of samples overheating during operation.

Metal protective inserts inside the casing and lid, automatic imbalance switch-off and locking of a lid provide safe operation. A sound signal indicates the completion of centrifugation.

The external power supply unit allows operating **Microspin 12** in cold rooms (at ambient temperatures from +4°C to +40°C).

SPECIFICATIONS

Speed control range	1,000–14,500 rpm (100 rpm increment)
Relative centrifugal force control range	50–12,400 × g
Digital time setting	15 s–30 min
Timer sound signal	yes
Time setting resolution	1 min–15 s; after 1 min–1 min
Acceleration time up to 14,500 rpm	20 s
Slowdown time, not more	10 s
Display	LCD, 2 line
Safety: Rotor imbalance diagnostics: automatic stop, "IMBALANCE" warning	
Overall dimensions (W×D×H)	200 × 240 × 125 mm
Weight	3.5 kg
Input current/power consumption	24 V, 2.5 A / 60 W
External power supply	Input AC 100–240 V 50/60 Hz; Output DC 24 V

ORDERING INFORMATION:

	Cat. number
Microspin 12	BS-010213-AA1
Built-in rotor MSR-12 (12 places for microtubes 1.5/2 ml) with protection lid MSL-SC and adapters A-02, A-05 (autoclavable)	

Additional/replacement parts:

MSL-SC, protection lid for rotors	BS-010213-EK
❶ **A-02,** 12 pieces for microtubes 0.2 ml	BS-010213-BK
❷ **A-05,** 12 pieces for microtubes 0.5 ml	BS-010213-AK

LMC-3000, Laboratory Centrifuge

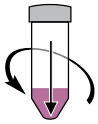
DESCRIPTION

LMC-3000 is a modern low-speed bench-top centrifuge designed for operation with microtest plates and centrifuge tubes up to 50 ml, Gel Cards. This device is widely used in biomedical profile laboratories.

Features:

- Soft start and run-down of the rotor;
- User-friendly setting of centrifugation parameters and simultaneous display of both set and actual values;
- Safe operation at any speed is provided by metal protection chamber and case cover, automatic stop at imbalance and a lock keeping the lid closed while the centrifuge is running;
- Low noise level;
- Rotor selection;
- Setting rotor speed in RPM or RCF (Relative Centrifugal Force);
- Multiple accelerations (Slow, Normal, Fast) and deceleration (0, Slow, Normal, Fast) modes and possibility to switch off forced braking;
- Wide choice of accessory rotors.

Basic Plus
Product Class



Product video is available on the website

SPECIFICATIONS

Speed regulation range for centrifuge tubes	100–3,000 rpm (1,610 × *g*)
Speed regulation range for microtitre plates	100–2,000 rpm (560 × *g*)
Setting resolution	100 rpm
Rotor imbalance diagnostics (automatic stop, "IMBALANCE" warning)	
Display	LCD, 2 × 16 signs
Digital time setting	1–90 min (increment 1 min)
Timer sound signal	yes
Chamber diameter	340 mm
Overall dimensions (W×D×H)	420 × 495 × 235 mm
Weight	11.8 kg
Nominal operating voltage	230 V, 50/60 Hz or 120 V, 50/60 Hz
Power consumption (230/120 V)	110 W (0.5 A)/ 120 W (1 A)

Rotor R-12/15

ORDERING INFORMATION:

	Cat. number
LMC-3000 without rotors	BS-010208-AAA

Rotors description, pictures and catalogue numbers can be found on page 52-53

LMC-4200R, Laboratory Refrigerated Centrifuge

Premium
Product Class

Product video is available on the website

DESCRIPTION

Laboratory bench-top centrifuge with refrigeration **LMC-4200R** provides temperature control of biomaterial during centrifugation. Temperature control of the so-called "cold-shelf" is a gold standard for enzymologists and cell biologists because it ensures conditions necessary for reproducibility of the sample preparation stage. Temperature control absence at this stage can cause unpredictable results.

LMC-4200R is a modern centrifuge designed for operation with microtest plates, Gel Cards and tubes from 2 to 50 ml.

SPECIFICATIONS

Temperature control range	-10°C ... +25°C
Stable temperature maintenance range	25°C below ambient ... to +25°C
Temperature setting resolution	1°C
Speed regulation range for centrifuge tubes	100–4,200 rpm (3,160 × g)
Speed regulation range for microtitre plates	100–2,000 rpm (560 × g)
Speed setting resolution	100 rpm
Rotor imbalance diagnostics (automatic stop, "IMBALANCE" warning)	
Slowdown time, not more	30 s
Display	LCD, 2 lines
Digital time setting	1–90 min (increment 1 min)
Timer sound signal	yes
Chamber diameter	360 mm
Dimensions (W×D×H)	635 × 580 × 335 mm
Weight	56 kg
Nominal operating voltage	230 V, 50 Hz
Power consumption (230 V)	990 W (4.3 A)

Rotor R-24/10

Features:

- Effective way of acceleration and deceleration: Run-up time 20 sec; Run-down time, not more 30 sec;
- Efficient rate of chamber refrigeration: under 10 min;
- Maintenance of stable temperature during operation;
- User-friendly setting of centrifugation parameters (speed, temperature, time) and simultaneous display of both set and actual values;
- Safe operation is provided by a metal protection chamber and a case cover, automatic stop at imbalance (emergency shutdown, "IMBALANCE" displayed) and a lock keeping the lid closed while the centrifuge is running;
- Low noise level;
- Possibility to switch off forced braking;
- Wide choice of accessory rotors;
- Rotor selection;
- Setting rotor speed in RPM or RCF (Relative Centrifugal Force);
- Multiple accelerations (Slow, Normal, Fast) and deceleration (0, Slow, Normal, Fast) modes and possibility to switch off forced braking;

ORDERING INFORMATION:	Cat. number
LMC-4200R without rotors	BS-010212-AAA

Rotors description and pictures can be found on next pages

Interchangeable Rotors for **LMC-3000** and **LMC-4200R**

Rack **RR-U**

		Rotor **R-12/10**	Rotor **R-24/10**	Rotor **R-6**	Rotor **R-6P**
Rotor type		Swing-out			
Dimensions (Ø×Length)		16 × 105 mm		29 × 115 mm	
Capacity		12	24	6	
Tube's volume		10–15 ml		50 ml	
Max. speed		4,200 rpm	4,000 rpm	4,200 rpm	
Max. RCF:	**LMC-3000**	1,610 × *g*	*Not applicable*	1,610 × *g*	
	LMC-4200R	3,160 × *g*	2,860 × *g*	3,160 × *g*	
Cat. number:		BS-010208-BK	BS-010212-JK	BS-010208-DK	BS-010208-XK

HOW TO CHOSE ROTOR

Plastic conical bottom centrifuge tube

Manufacturers: **Falcon, Greiner Bio-one, Sarstead, Corning, Nunc, TPP, etc.**

15 ml

R-12/15

Material: Aluminium

R-6

50 ml

Material: Kocetal® POM (Max. temperature +150 °C)

R-6P

Plastic round bottom centrifuge tube, Vacutainers

Manufacturers: **Nunc, Greiner, Greiner Bio-one, TPP, etc.**

12 pcs.

2–10 ml + Adapters

10–15 ml

R-12/10

24 pcs.

Only for LMC-4200R

2–10 ml + Adapters

10–15 ml

R-24/10

Interchangeable Rotors for LMC-3000 and LMC-4200R

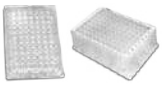
Rack **RR-U**

Rotor **R-12/15**		Rotor **R-2**	Rotor **R-24GC**
Angled Swing-out	Rotor type	Swing-out	
17 × 120 mm	Dimensions (W×L)	128 × 85.6 mm	53 × 74 mm
12	Capacity	2	24
15 ml	Max. height	up to 45 mm	—
4,200 rpm	Max. speed	2,000 rpm	1,500 rpm
1,610 × *g*	Max. RCF: **LMC-3000**	560 × *g*	280 × *g*
3,160 × *g*	Max. RCF: **LMC-4200R**	560 × *g*	280 × *g*
BS-010208-EK	Cat. number:	BS-010208-AK	BS-010208-VK

HOW TO CHOSE ROTOR

Standard 96-well microtitre plates, skirted PCR plates and deepwell plates up to 45 mm

Manufacturers: **Nunc, Greiner, Greiner Bio-one, etc.**



R-2

96-well semi-/ unskirted PCR plate

Manufacturers: **Nunc, Greiner, Greiner Bio-one, etc.**

Adapter

+

AP-96

R-2

Material: Ertacetal® POM-C and is autoclavable

Gel Cards

Manufacturers: **Grifols®, DiaMed®, Bio-Rad® etc.**

R-24GC, Rotor for Gel Cards for blood group serology testing (Forward Group, Reverse Group, RhD Type and 3 cell antibody screen). Recommended centrifugation time – 9 minutes

R-24GC

ORDERING INFORMATION: optional accesories for rotors — Cat. number

Adapter* for R-2:			
AP-96	2 adapters for 96-well semi-skirted and non-skirted PCR plates		BS-010219-DK
Adapters** for R-12/10, R-24/10:		Vacutainers dimensions (Ø × length)	
BN-13/75	for vacutainers® 2–5 ml	13 × 80 mm	BS-010208-PK
BN-13/100	for vacutainers® 4–8 ml	13 × 105 mm	BS-010208-QK
BN-16/100	for vacutainers® 8–10 ml	16 × 105 mm	BS-010208-RK
Rack for rotors			
RR-U			BS-010208-UK

* — Set of 2 adapters, made of **Ertacetal® POM-C** and is autoclavable

** — Set of 12 adapters, made of **Kocetal® POM.** Max. temperature +100°C

THERMOSTATED EQUIPMENT:

THERMOSTATS – DRY BLOCK, HEATING/COOLING SYSTEMS

CH-100

Heating/Cooling Dry Block

CH 3-150

Heating and cooling thermostat

TDB-120

Dry block thermostat

Catalogue 2021

Bio TDB-100 and TDB-120, Dry Block Thermostats

DESCRIPTION

Bio TDB-100 / TDB-120 — compact, easy-to-use thermostat for Eppendorf type micro tubes. It is specially designed for long incubation at different temperatures. The thermostat has an undeniable advantage in working with microquantities of reagents in microtubes. The thermostat possesses unprecedentedly high precision and uniformity of temperature distribution over the block.

With the help of the software-enabled temperature calibration function, the user can calibrate the unit in the range of several percent of the selected temperature to compensate for differences in the thermal behaviour of tubes from different manufacturers.

Blocks (built in) specifications:

Bio TDB-100

❶ **Block** 24 × 2/1.5 ml + 15 × 0.5 ml +10 × 0.2 microtubes

TDB-120

❷ **Block A-53** 21 × 0.5 ml +32 × 1.5 ml microtubes

❸ **Block A-103** 21 × 0.5 ml +32 × 1.5 ml +50 × 0.2 ml microtubes

❶ Block for Bio TDB-100

Basic Plus
Product Class

Bio TDB-100

Heat up times for **Bio TDB-100:**

Basic Plus
Product Class

TDB-120 with block A-103

Heat up times for **TDB-120:**

Products video is available on the website

Bio TDB-100 and TDB-120, Dry Block Thermostats

SPECIFICATIONS

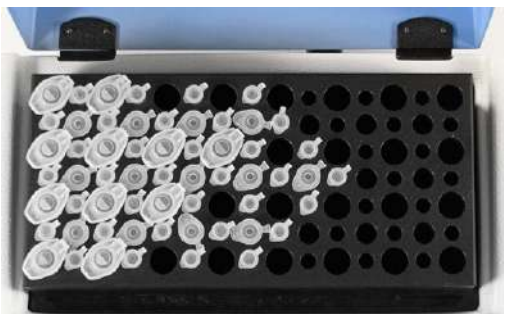
	Bio TDB-100	TDB-120
Temperature setting range	+25°C ... +100°C	+25°C ... +120°C
Temperature control range	5°C above ambient ... +100°C	5°C above ambient ... +120°C
Temperature setting resolution	0.1°C	
Temperature stability	±0.1°C	
Temperature uniformity @ +37°C	±0.1°C	
Temperature calibration coefficient range	0.936–1.063 (± 0.063)	0.968–1.031 (± 0.031)
Digital time setting	1 min – 96 h/non-stop (increment 1 min)	
Timer sound signal	yes	
Display	LCD, 2 × 16 signs	
Block capacity	24 × 2/1.5 ml +15 × 0.5 ml + 10 × 0.2 ml microtubes	**A-53** 21 × 0.5 ml +32 × 1.5 ml microtubes **A-103** 21 × 0.5 ml +32 × 1.5 ml +50 × 0.2 ml microtubes
Overall dimensions (W×D×H)	210 × 230 × 115 mm	230 × 210 × 110 mm
Weight	2.8 kg	
Nominal operating voltage	230 V, 50/60 Hz or 120 V, 50/60 Hz	
Power consumption	200 W (870 mA)	

ORDERING INFORMATION:

	Cat. number
Bio TDB-100 with built-in block	BS-010412-AAA
TDB-120 with built-in block **A-103**	BS-010401-QAA
TDB-120 with built-in block **A-53**	BS-010401-PAA

2 Block A-53

3 Block A-103



CH-100, Heating/Cooling Dry Block

DESCRIPTION

CH-100 is the result of combining two popular Biosan instruments:

1. Heating Dry block and

2. Cooling Dry block thermostat

The combined construction of the aluminium block and Peltier element module cooled with the forced ventilation radiator provides fast switching of the cooling and heating modes.

CH-100 is a very effective instrument for sample preparation during enzyme reactions, hybridization reactions, DNA analysis.

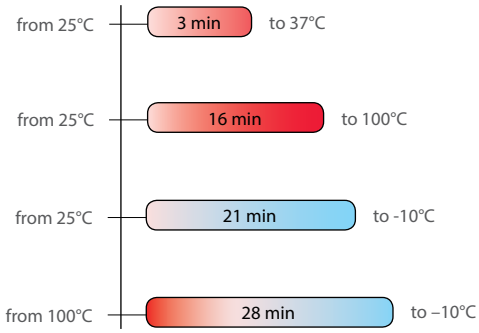
Microprocessor controlled time and temperature. Simultaneous indication of the and actual temperature and time.

Basic Plus
Product Class

SPECIFICATIONS

Temperature setting range	–10 °C ... +100 °C
Temperature control range	30°C below ambient ...+100°C
Temperature setting resolution	0.1°C
Temperature stability	±0.1°C
Temperature uniformity @ +37 °C	±0.1°C
Temperature calibration coefficient range	0.936–1.063 (±0.063)
Digital time setting	1 min–96 h/non-stop (increment 1 min)
Timer sound signal	yes
Display	LCD, 2 × 16 signs
Overall dimensions (W×D×H)	240 × 260 × 165 mm
Weight	3.2 kg
Input current/power consumption	12 V, 4.4 A / 55 W
External power supply	Input AC 100–240 V 50/60 Hz; Output DC 12 V

Heat up and cool down times for **CH-100:**



Product video is available on the website

Blocks (built in) capacity:

Block **CH-1**	20 × 0.5 ml +12 × 1.5 ml microtubes
Block **CH-2**	20 × 1.5 ml microtubes
Block **CH-3**	20 × 2 ml microtubes

ORDERING INFORMATION:	Cat. number
CH-100 with block **CH-1**	BS-010410-BAI
CH-100 with block **CH-2**	BS-010410-CAI
CH-100 with block **CH-3**	BS-010410-UAI

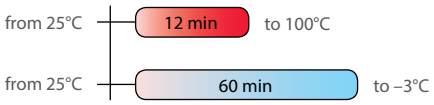
Ice on block CH-2

CH 3-150, Combitherm-2

Premium Product Class

Product video is available on the website

Heat up and cool down times for **CH3-150:**



INTERCHANGEABLE THERMOBLOCKS:

❶	**B2-50**	Ø48 mm × 2 sockets, depth 58 mm
❷	**B10-16**	Ø16 mm × 10 sockets, depth 56 mm
❸	**B6-25**	Ø25 mm × 6 sockets, depth 40 mm
❹	**B23-1.5**	23 sockets for 1.5 ml microtubes, depth 35 mm
❺	**B10-13**	Ø13 mm × 10 sockets, flat bottom, depth 30 mm
❻	**B5-29**	Ø29 mm × 5 sockets, flat bottom, depth 40 mm
❼	**B18-12**	18 sockets for Ø12 mm round bottom tubes, depth 58 mm

Different block types can be provided on request

ORDERING INFORMATION:	Cat. number
CH 3-150 without blocks	BS-010418-AAA
Optional blocks:	
B2-50	BS-010418-AK
B10-16	BS-010418-BK
B6-25	BS-010418-CK
B23-1.5	BS-010418-DK
B10-13	BS-010418-LK
B5-29	BS-010418-KK
B18-12	BS-010418-EK

DESCRIPTION

Combitherm-2 **CH3-150** is specially designed to thermostabilise materials at temperatures from –3 °C to +150 °C according to analysis methods. To obtain useful functionality and decrease foot-print of instruments Combitherm-2 thermoblocks combined in a common electronic circuit board as well as inside a common external body. The front keyboard's left part is responsible for setting parameters for cooling plug-in blocks and the right part — for heating plug-in blocks. Both of them are regulated independently and can realise up to 16 programs, including temperature and time in each program. Peltier technology is used for cooling below room temperature; PCB is used for heating till +150°C.

Separation of cooling and heating parts from each other increases durability of the instrument and speed of temperature changing after setting a new program.

SPECIFICATIONS

Heating Block Specifications:	
Temperature setting range	+25°C ... +150°C
Temperature control range	5°C above ambient ...+150°C
Setting resolution	1°C
Stability	±0.1°C
Temperature calibration coefficient range	0.936...1.063 (±0.063)
Cooling Block Specifications:	
Temperature setting range	–3°C ... +20°C
Temperature control range	23°C below ambient ... 5°C below ambient
Setting resolution	0.1°C
Stability	±0.1°C
General Specifications	
Digital time setting	1 min–99 h 59 min (increment 1 min)
Timer sound signal	yes
User adjustable programs (temperature and time)	16 (heating) +16 (cooling)
Display	LCD
Overall dimensions (W × D × H)	295 × 285 × 220 mm
Weight (without block)	5.6 kg
Nominal operating voltage	230 V, 50/60 Hz
Power consumption	430 W (1.8 A)

❶ B2-50 ❷ B10-16 ❸ B6-25 ❹ B23-1.5 ❺ B10-13 ❻ B5-29 ❼ B18-12

QB Series, Dry Block Heating Systems with Interchangeable Blocks

Equipment presented on pages 60–61 is produced by Grant Instruments (Cambridge) Ltd. Biosan is the sole distributor of Grant Instruments products in Russia, CIS and the Baltic States (Latvia, Lithuania, Estonia) and the official distributor for a number of other regions.

DESCRIPTION

A market-leading range of versatile, high-quality dry block heating systems with excellent temperature control, providing a source of precision heating for many sensitive analytical procedures.

A premium product range at an affordable price:

- Accurate, reproducible and safe heating of your samples — advanced temperature control combined with high quality, precision-engineered blocks providing excellent thermal contact;
- Versatile range of interchangeable heating blocks to fit any tube or plate you are using for your samples;
- Full range of models and options to cater for basic through to more sophisticated applications;
- Wide range of accessories.

Product video is available on the website

QBD4 with a lid

QBH2

Accessories

SPECIFICATIONS

Model (Cat. Num.)	QBD1 / QBD2 / QBD4	QBH2
Type	Digital	Digital
Number of blocks	1/2/4	2
Temperature range	amb. +5°C to 130°C	amb. +5°C to 200°C
Temperature setting range	+15°C to 130°C	+15°C to 200°C
Temperature stability @ 37°C	±0.1	±0.1
Temperature uniformity within the block @ 37°C	±0.1	±0.1
Display / Resolution	LED / 0.1°C	LED / 0.1°C
Safety: Overtemperature	Thermal fuse	
Timer with a sound alarm	1 min up to 72 h	
Heat up time from 25°C to 100°C	15 min	
Power consumption	150/300/600 W	300 W
Power supply	120 V or 230 V	

ORDERING INFORMATION: Catalogue number matches the name of the product

QB Series, Dry Block Heating Systems with Interchangeable Blocks: Accessories

Interchangeable blocks (Cat. Num.)		QBD1	QBD2	QBD4	QBH2	QBA1	QBA2
No. of blocks		1	2	4	2	1	2
QB-0 Plain block without holes		+	+	+	+	+	+
QB-10 24 × 10 mm Ø holes, 50 mm hole depth		+	+	+	+	+	+
QB-12 24 × 12 mm Ø holes, 50 mm hole depth		+	+	+	+	+	+
QB-13 12 × 13 mm Ø holes, 50 mm hole depth		+	+	+	+	+	+
QB-16 12 × 16 mm Ø holes, 50 mm hole depth		+	+	+	+	+	+
QB-17H for 10 × Falcon tubes tall 17 mm diam, 75 mm deep		+	+	+	+	+	+
QB-18 12 × 18 mm Ø holes, 50 mm hole depth		+	+	+	+	+	+
QB-24 5 × 24 mm Ø holes and universal bottles, 50 mm hole depth		+	+	+	+	+	+
QB-50 4 × 50 ml centrifuge tubes, glass universals, 50 mm hole depth		+	+	+	+	+	+
QB-H 56 × 0.2 ml microtube, 14 mm hole depth		+	+	+	+	+	+
QB-E0 24 × 0.5 ml microtube, 30 mm hole depth		+	+	+	+	+	+
QB-E1 24 × 1.5 ml microtube, 35 mm hole depth		+	+	+	+	+	+
QB-E2 24 × 2.0 ml microtube, 35 mm hole depth		+	+	+	+	+	+
QB-E5 12 x 5.0 ml microtube, 53.5 mm hole depth, 16.7 mm diameter		+	+	+	+	+	+
QB-DN Dolphin nose tube 24 × Ø 11.13 mm to Ø 6.1 mm		+	+	+	+	+	+
External Pt1000 temperature probe							
QBEP	Standard probe. For in-sample or in-block temperature control; encased in stainless steel sheath, Ø 3 mm × 30 mm long, with 350 mm of cable	+	+	+	+	–	–
QBEP-WM	Short-form probe. For in-sample or in-block temperature control; encased in stainless steel sheath, Ø 3 mm × 14 mm long, with 350 mm of cable	+	+	+	+	–	–
Microplate blocks of molecular biology and biotechnology applications Double-size blocks 140 × 100 × 75 mm supplied with additional extraction tool							
QDP-H	96 holes in microplate configuration for 0.2 ml microplates, strips or individual tubes. Uniformity ± 0.3°C within tubes across the block; 6.2 mm Ø holes, 14 mm hole depth	–	+	–	+	–	+
QDP-FL	Universal block for standard 96-well plates (u-well, v-well, flat bottom, high temperature) Uniformity ± 0.5°C between wells; supplied with hinged, double layer lid to create an insulated incubation chamber	–	+	–	+	–	+
Safety covers (not required with QDP-FL Microtiter blocks)							
	Made from tough clear acrylic for maximum visibility whilst preventing accidental touching of a hot block or contamination of samples from splashes. Clearance height 85 mm	QBL1	QBL2	QBL4	QBL2	QBL1	QBL2

ORDERING INFORMATION: Catalogue number matches the name of the product

THERMOSTATIC EQUIPMENT:

WATER BATHS, ORBITAL/LINEAR SHAKING BATHS, UNSTIRRED WATER BATHS, HEATING/COOLING CIRCULATORS

Optima™ Series

Stirred Thermostatic Baths and Heating Circulators

LT ecocool™

Energy Efficient Refrigerated / Heating Circulating Baths

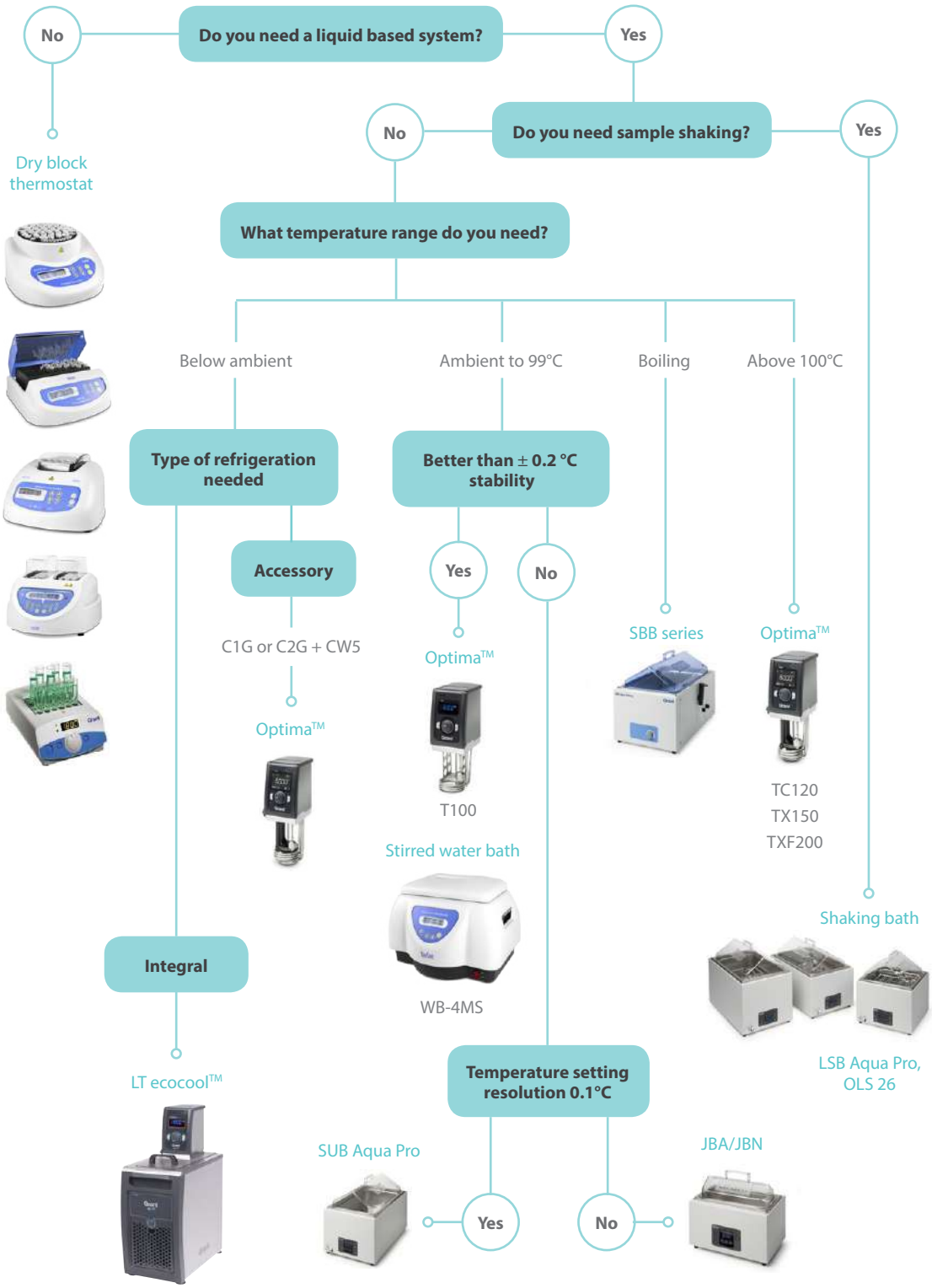
WB-4MS

Stirred water bath

Catalogue 2021

How to choose thermostat?

How to choose thermostat?



WB-4MS, Stirred water bath

DESCRIPTION

Stirred water bath **WB-4MS** is designed for chemical, pharmaceutical, medical and biological laboratory research, for processes requiring constant temperature ranging from ambient temperature to 100°C.

WB-4MS provides increased temperature stabilization (up to 0.1°C) due to a built-in magnetic stirrer (speed control range 250–1000 rpm).

Easy setup, high-temperature maintenance accuracy, compact size and attractive modern design make this water bath widely used.

Basic Plus
Product Class

WB-4MS with two adapters

Rack TR-16/19

SPECIFICATIONS

Tank capacity	4 l
Temperature setting range	+25°C ... +100°C
Temperature control range	5 °C above ambient ... +100°C
Temperature setting resolution	0.1°C
Temperature stability	±0.1°C
Temperature uniformity @ +37°C	±0.1°C
Stirring speed control range	250–1000 rpm
Digital time setting	1 min–96 h/non-stop (increment 1 min)
Timer sound signal	yes
Display	LCD, 2 × 16 signs
Digital setting of temperature, time and mixing speed	
Plastic lid with stainless steel interior included	
Quiet operation	
Working volume	235 × 135 × 110 mm
Overall dimensions (W×D×H)	340 × 270 × 250 mm
Weight	3.4 kg
Nominal operating voltage	230 V, 50/60 Hz or 120 V, 50/60 Hz
Power consumption	230 V, 50 Hz/600 W (2.6 A) 120 V, 60 Hz/670 W (5.6 A) 100 V, 50/60 Hz/600 W (6.0 A)
Maximum continuous operation time	24 h

ORDERING INFORMATION:

	Cat. number
WB-4MS with base **BP-1** and lid	BS-010406-AAA

Optional accessories:

Racks:	Diameter/tube volume	Capacity	Cat. number
❶ TR-5/30	Ø 30 mm	5 tubes	BS-010406-KK
❷ TR-16/19	Ø 16–19 mm	16 tubes	BS-010406-FK
❸ TR-30/13	Ø 10–13 mm	30 tubes	BS-010406-IK
❹ TR-44/11	2/1,5 ml	44 tubes	BS-010406-JK

Combined Orbital/Linear Shaking Bath **OLS26**

DESCRIPTION

Patented, combined orbital and linear shaking mechanism of the **OLS26** allows optimisation of aeration and shear forces mixing for reproducible results.

- Precision digital temperature control;
- 0°C to 99°C operating range;
- Stability ±0.1°C;
- Easy changeover from linear to orbital shaking;
- Adjustable shaking speed and stroke length;
- Polycarbonate lid included as standard;
- Drain tap for convenient emptying;
- 3 year warranty;
- TU26 included, other trays sold separately.

SPECIFICATIONS

Tank size	26 l
Minimum working depth	70 mm
Temperature control range	ambient +5 to 99°C. 0 to 99°C with accessory cooling
Temp. uniformity (DIN 12876-3) @ 70°C	±0.1°C
Temp. stability (DIN 12876-3) @ 70°C	±0.1°C
Display	2 × LED (individual displays and controls for temperature and shaking speed)
Orbital and Linear shaking speed	20 to 200 rpm (depending on load)
Orbital shaking radius	9 mm
Shaking speed display resolution	1 rpm
Linear shaking stroke length	18, 28, and 36 mm
Shaking tray area	380 × 235 mm
Timer	1 to 999 min
Dimensions (W×D×H)	335 × 590 × 475 mm
Heater power 120 V/230 V	1.05/1.4 kW
Drain tap	yes
Safety	over temperature protection/ low liquid level cut-out
Supply voltage	110–120 V or 220–230 V

ORDERING INFORMATION:	Cat. number
OLS26 with TU26 tray	OLS26

Equipment presented on pages 60–61, 67–79 is produced by Grant Instruments (Cambridge) Ltd. Biosan is the sole distributor of Grant Instruments products in Russia, CIS and the Baltic States (Latvia, Lithuania, Estonia) and the official distributor for a number of other regions.

Description and pictures of all available accessories can be found on page 69

Linear shaking bath — **LSB Aqua Pro** range

DESCRIPTION

World-renowned shaking water baths. High quality, robust design with unique magnetically coupled shaking mechanism for maximum reliability, consistency and quiet operation. Extensive range of accessories to provide the right solution for your application. Varied vessels types can be securely held using high-quality springs, clamps or racks.

FEATURES

- Ambient +5˚C to 99˚C operation;
- Stability ±0.1˚C;
- Choice of two models — 12 and 18 litres;
- Drain tap for convenient emptying;
- 3 year warranty;
- Polycarbonate lid included;
- Extensive choice of accessory shaking trays. Tray sold separately.

SPECIFICATIONS

	LSB12	LSB18
	9.2 kg W: 360 mm D: 385 mm H: 425 mm	11.2 kg W: 335 mm D: 565 mm H: 425 mm
Tank size	12 l	18 l
Minimum working depth	60 mm	
Temperature range	ambient +5 to 99°C	
Uniformity (DIN 12876-3) @ 70°C	±0.1°C	
Stability (DIN 12876-3) @ 70°C	±0.1°C	
Display	LED	
Linear shaking speed	20 to 200 strokes/min (depending on load)	
Shaking speed display resolution	1 strokes/min	
Linear shaking stroke length	20 mm	
Shaking tray area	240 × 235 mm	420 × 235 mm
Timer	1 to 999 min	
Heater power 120/230V	0.8/0.8 kW	1.05/1.4 kW
Drain tap	yes	
Safety	over-temperature protection/low liquid cut-out	
Supply voltage	110–120 V or 220–230 V	

ORDERING INFORMATION:

	Cat. number
LSB12, Linear shaking bath 12 l with TU12 tray	LSB12
LSB18, Linear shaking bath 18 l with TU18 tray	LSB18

Description and pictures of all available accessories can be found on next page

Accessories for Shaking Baths: **LSB 12, LSB 18 & OLS 26**

Accessories **LSB** and **OLS Aqua Pro** Product/description		**OLS26**	**LSB12**	**LSB18**
		Catalogue number		
	Universal tray with adjustable springs. Highly versatile for a variety of vessel types.	TU26	TU12	TU18
	Flask/plate tray — with threaded holes to accept flask clamps or holder for deep well plates (≥2ml). See option below.	TF26	TF12	TF18
	Test tube tray — compatible with SR racks or can be used alone to accommodate bags and miscellaneous vessels. See rack option below.	TS26 (holds up to 5 SR racks)	TS12 (holds up to 3 SR racks)	TS18 (holds up to 5 SR racks)
	Base tray — perforated stainless steel, allows bath to be used as an unstirred bath.	SBT26	SBT12	SBT26
	Cooling coil — the source of constant cooling to enable bath to be operated at or below ambient, down to 0 °C. LS200 lid (with an access hole for cooling coil) recommended.	CC26	—	
	Heat exchange coil — attach to a cold water supply or refrigerated circulator. Can be used down to 2°C above the temperature of the coolant. LS200 lid (with an access hole for cooling coil) recommended.	CW26	—	
	Stainless steel sloping lid, gabled.	LS200	LU14	LU28
	Replacement polycarbonate lid, clear, gabled.	AQL26	AQL12	AQL26

Flask clamps and plate holder for TF tray

Cat. number	Description	**OLS26** Capacity	**LSB12** Capacity	**LSB18** Capacity
SC-25	for 25 ml flask	28	18	33
SC-50	for 50 ml flask	24	14	26
SC-100	for 100 ml flask	15	9	17
SC-250	for 250 ml flask	8	5	14
SC-500	for 500 ml flask	6	4	6
SC-1000	for 1,000 ml flask	3	2	4
SH-DWP	1 × deep well plate	4	1	4

Test tube racks / microtube racks for TS tray

Cat. number	Tube diameter (mm)	Rack capacity
SR-10	10	48
SR-13	13	44
SR-16	16	24
SR-19	19	21
SR-25	25	12
SR-30	30	10
Cat. number	**Microtube size (ml)**	**Rack capacity**
SR-SE	0.5	119
SR-LE	1.5	48

ORDERING INFORMATION:

Catalogue number matches the name of the product

Unstirred Water Bath

SUB Aqua Pro — advanced water bath range with a choice of eight models. Supplied with a base tray, lid and drain on larger bath.

JB Academy — basic range with a choice of three models. Supplied with a base tray.

JB Nova - general purpose water bath range with a choice of four models. Supplied with a base tray, lid and drain on larger bath.

SBB Aqua Plus boiling bath range - basic range with a choice of three models. Supplied with a base tray.

- The reliability, quality and consistent performance of Grant products have made Grant a leading manufacturer of water baths for decades;
- A new era for Grant water baths — now all models from basic to advanced with digital controls;
- Proven performance — technology to deliver temperature control you can rely on;
- Set and Forget™ technology — minimal bath setup, maximum time for your work.

More information about offered Grant Instruments products can be found on Biosan web-site www.biosan.lv

SUB Aqua Pro Digital Unstirred Water Bath

DESCRIPTION

Built to the highest standard and specifications and incorporating the latest technology, the SUB Aqua Pro advanced water bath range supports even the most demanding applications, that require accurate temperature control. Choose from eight models with base tray and lid included as standard.

- Ambient +5°C to 99°C operation;
- Set and Forget™ technology — fast heat-up, accurate temperature control;
- Stability ±0.2°;
- Adjustable over temperature alarm — protect samples from overheating;
- Advanced dry start and run-dry protection;
- Three programmable temperature presets;
- 3 year warranty.

SPECIFICATIONS

	SUB Aqua Pro digital unstirred water bath range – summary of specifications							
	SAP2	SAP2S	SAP5	SAP12	SAP18	SAP26	SAP34	SAPD
	2.5 kg W: 185 mm D: 200 mm H: 200 mm	3 kg W: 335 mm D: 215 mm H: 150 mm	3 kg W: 335 mm D: 215 mm H: 200 mm	6 kg W: 360 mm D: 380 mm H: 225 mm	9.5 kg W: 335 mm D: 590 mm H: 275 mm	9 kg W: 335 mm D: 590 mm H: 275 mm	14.5 kg W: 335 mm D: 590 mm H: 275 mm	9 kg W: 545 mm D: 380 mm H: 225 mm
Tank capacity	2 l	2 l (shallow)	5 l	12 l	18 l	26 l	34 l	5 l & 12 l
Temperature range	ambient t°C + 5 to 99							
Temp. display and setting resolution	0.1°C							
Temp stability (DIN 12876) @ 70 °C	±0.2°C							
Temperature setting/energy regulation	digital							
User adjustable over temp. alarm	+							
Fixed thermal cut-out	+							
Dry start/boil dry protection	+							
Programmable temp. presets	3							
Countdown timer with audible alarm	1 to 999 min							
Working area D×W (mm)	117 × 131	139 × 289	131 × 281	281 × 306	485 × 281	481 × 278	635 × 281	131 × 281 & 281 × 306
Minimum fill level	50 mm	32 mm	50 mm	50 mm	50 mm	70 mm	70 mm	50 mm
Maximum fill level	25 mm below the top of the tank							
Drain tap included	–	–	–	+	+	+	+	+
Heater power 120 V/230 V kW	0.25/0.25	0.35/0.35	0.35/0.35	0.8/0.8	1.4/1.05	1.4/1.05	1.8/1.3	1.15/1.15
Supply voltage V	120 or 230							

ORDERING INFORMATION:

Catalogue number matches the name of the product

SUB Aqua Pro Digital Unstirred Water Bath

OPTIONS AND ACCESSORIES							
SAP2	**SAP2S**	**SAP5**	**SAP12**	**SAP18**	**SAP26**	**SAP34**	**SAPD**
2 l	2 l (shallow)	5 l	12 l	18 l	26 l	34 l	5 l & 12 l
Replacement polycarbonate transparent lids*							
AQL2	AQL5	AQL5	AQL12	AQL26	AQL26	—	AQL5, AQL12
Directs condensation away from immersed vessels, avoids contamination, reduces evaporation and saves energy							
Stainless steel sloping lids*							
—	LU6	LU6	LU14	LU28	LU28	LU36	LU6 & LU14
Flat lids*							
—	—	LF6 (2 ring sets)	LF14 (4 ring sets)	LF28 (6 ring sets)	LF28 (6 ring sets)	LF36 (8 ring sets)	LF6 / LF14
With ring sets of variable hole diameter to accommodate tall vessels whilst reducing evaporation							
Polypropylene spheres* (packs per bath)							
1 × PS20	1 × PS20	1 × PS20	1 × PS20	2 × PS20	2 × PS20	3 × PS20	2 × PS20
Useful alternative to a lid, minimises evaporation and heat loss whilst allowing easy access to vessels in the bath; particularly useful for tall vessels							
Raised shelves – reversible, allows two shelf depths. h = shelf height above tank base (mm)							
—	—	—	RS14H (h 40 or 78) shelf covers half area of SAP12	RS18H (h 40 or 135) shelf covers half area of SAP18	RS28H (h 45 or 135) shelf covers half area of SAP26	RS36H (h 45 or 135) shelf covers half area of SAP34	RS14H (h 40 or 78) shelf covers half area of SAPD
Racks (no. per bath)							
—	—	1 × J2	2 × J2	4 × J2	4 × J2	6 × J2	1 + 2 × J2
Choice of eight variants to accommodate different tube diameters and microtubes (see below)							
Replacement base trays							
AQBT2	AQBT5	AQBT5	AQBT12	AQBT26	AQBT26	SBT36	AQBT5 & AQBT12
Required if flat-bottomed flasks are to be placed directly on the base of the bath and to promote thermal convection in the bath							

* — Lid or spheres recommended for use above 60˚C

Unstirred Bath Racks

J2 Racks	Tube size Ø	Capacity	J2 Racks	Tube size Ø	Capacity
J2-10	10 mm	84	J2-25	25 mm	18
J2-13	13 mm	55	J2-30	30 mm	12
J2-16	16 mm	36	J2-SE	0.5 ml	105
J2-19	19 mm	32	J2-LE	1.5 ml	65

ORDERING INFORMATION

Catalogue number matches the name of the device

Optima™ Series, Stirred Thermostatic Baths and Heating Circulators

T100-P5

T100-P12
with lid

DESCRIPTION

A cost-effective range of multi-purpose systems combining Grant's legendary quality and reliability. Precise temperature control for a wide range of laboratory applications.

- **Accurate and safe temperature control** — for samples and users;
- **Intuitive programming and thoughtful design features** — makes working with Grant heated baths and circulators easy;
- **Robust, durable construction** — for longevity, reliability and long-term low cost of ownership;
- **A complete range** — 32 models to cover basic through to sophisticated needs, each model represents excellent value for money.

APPLICATIONS

Grant stirred baths and circulators provide a source of precision heating and cooling for many routines and sensitive analytical procedures including sample incubation, calibration and quality control testing. All models from the **TC120** upwards are suitable for unnecessary both open and closed-loop circulators (i.e. remote vessel open or closed).

For more powerful heating requirements, i.e. above 200 °C, contact marketing@biosan.lv for advice.

Heating Circulators Specifications on page 74 and all available accessories on page 76

Model selection (see next page):

Any of the four **Grant Optima™** digital thermostats can be combined with any of eight Grant tanks (five stainless steel and three plastic) to provide a choice of 32 models.

Optima™ Series, Heating Circulators Specifications

T100

TC120

TX150

TXF200

SPECIFICATIONS

Grant Optima™ Heating Circulators Specifications		General purpose Digital		Digital High Performance	
		T100	**TC120**	**TX150**	**TXF200**
Stability (DIN 12876) @ 70°C	°C	±0.05	±0.05	±0.01	±0.01
Uniformity (DIN 12876) @ 70°C	°C	±0.1	±0.1	±0.05	±0.05
Setting resolution	°C	0.1	0.1	0.1 (0.01 with Labwise™)	
Display		4 digit LED		full colour QVGA TFT	
Timer function		—	1 to 6,000 min	1 min to 99 h 59 min	
No. preset temperatures		3	3	3	3
Re-calibration points		2	2	5	5
Offset adjustment		—	—	+	+
Socket for external probe (TXPEP, TXSEP)		—	—	+	+
Communication interface		—	—	USB & RS232	USB & RS232
Programmable		—	—	remote via PC/laptop 1 program/ 30 segments	direct via user interface or remote via PC/laptop 10 programs / 100 segments
Relays		—	—	1	1
Safety	overtemperature	fixed	adjustable cut-out		
Safety	fluid level — float switch	+	+	+	+
Alarms (can be configured to switch a relay)		—	high, without relay	high and low	high and low
Heater power 230 V	kW	1.3	1.3	1.9	1.9
Electrical power 230 V	kW	1.4 (50–60 Hz)	1.4 (50 Hz)	2.0 (50 Hz)	2.0 (50–60 Hz)
Height above tank rim	mm	200	200	200	200
Depth below tank rim	mm	135	135	135	135
Grant Optima™ thermostat pumps (integral)					
Maximum pressure	water, mbar	—	210	310	530
Maximum flow	water, l/min	—	16	18	23 (adjusted flow rate)
Pipe bore	inlet/outlet, mm	—	6/11	6/11	6/11
Dimensions (H×D×W)	mm	315 × 145 × 115			

ORDERING INFORMATION:

Cat. number:	T100 EURO	TC120 EURO	TX150 EURO	TXF200 EURO

Optima™ Series, Water Bath Combinations and Accessories

Capacity (l)	Outer tank dimensions 1. Dimensions (H×D×W) Weight (kg) 2. Working area (D×W) 3. Min/max fluid depths 4. Inner tank dimensions (H×D×W)	T100 Temperature setting range	TC120 Temperature setting range	TX150 Temperature setting range	TXF200 Temperature setting range
ST5 – 5 l **Stainless steel**	1. 215 × 335 × 187 mm, 2.9 kg 2. 150 × 260 mm 3. 85/140 mm 4. 150 × 300 ×150 mm	**T100–ST5** amb.+15 to 100 °C	**TC120–ST5** 0 to 120 °C	**TX150–ST5** 0 to 150 °C	**TXF200–ST5** 0 to 200 °C
ST12 – 12 l **Stainless steel**	1. 215 × 332 × 360 mm, 4.5 kg 2. 205 × 300 mm 3. 85/140 mm 4. 150 × 325 × 300 mm	**T100–ST12** 0 to 100 °C	**TC120–ST12** 0 to 120 °C	**TX150–ST12** 0 to 150 °C	**TXF200–ST12** 0 to 200 °C
ST18 – 18 l **Stainless steel**	1. 215 × 545 × 340 mm, 7.3 kg 2. 385 × 300 mm 3. 75/130 mm 4. 150 × 505 ×300 mm	**T100–ST18** 0 to 100 °C	**TC120–ST18** 0 to 120 °C	**TX150–ST18** 0 to 150 °C	**TXF200–ST18** 0 to 200 °C
ST26 – 26 l **Stainless steel**	1. 270 × 535 × 340 mm, 7.7 kg 2. 385 × 300 mm 3. 125/180 mm 4. 200 × 505 × 300 mm	**T100–ST26** 0 to 100 °C	**TC120–ST26** –15 to 120 °C	**TX150–ST26** –15 to 150 °C	**TXF200–ST26** –15 to 200 °C
ST38 – 38 l **Stainless steel**	1. 260 × 733 × 338 mm, 11.9 kg 2. 575 × 300 mm 3. 125/180 mm 4. 200 × 690 × 300 mm	**T100–S38** 0 to 100 °C	**TC120–S38** –15 to 120 °C	**TX150–S38** –15 to 150 °C	**TXF200–S38** –15 to 200 °C
P5 – 5 l **Plastic**	1. 180 × 323 × 220 mm, 2.2 kg 2. 120 × 150 mm 3. 85/140 mm 4. 155 × 240 × 160 mm	**T100–P5** amb.+15 to 99 °C	**TC120–P5** amb.+15 to 99 °C	**TX150–P5** amb.+15 to 99 °C	**TXF200–P5** amb.+15 to 99 °C
P12 – 12 l **Plastic**	1. 180 × 412 × 340 mm, 3.4 kg 2. 210 × 280 mm 3. 85/140 mm 4. 155 × 325 × 280 mm	**T100-P12** amb.+5 to 99 °C	**TC120–P12** amb.+5 to 99 °C	**TX150–P12** amb.+5 to 99 °C	**TXF200–P12** amb.+5 to 99 °C
P18 – 18 l **Plastic**	1. 180 × 589 × 340 mm, 5.1 kg 2. 375 × 280 mm 3. 85/140 mm 4. 155 × 510 × 290 mm	**T100–P18** amb.+5 to 99°C	**TC120–P18** amb.+5 to 99°C	**TX150–P18** amb.+5 to 99°C	**TXF200–P18** amb.+5 to 99°C
OPTIONS AND ACCESSORIES					
Labwise™ PC software (optional)					
Allows two-way communication for status display, programming and data capture		—	—	+	+
External probes (optional)					
TXPEP flexible plastic probe, 3 m cable TXSEP stainless steel probe, 3 m cable		— —	— —	+ +	+ +
Remote switching device (optional)					
For switching appliances on and off (up to max. 8 Amps)		—	—	1	2
Vertical turbine pumps (optional)					
Low noise, compact design. Supplied with pipe connections and special lid for fitting to tank, pipe bore 12.7 mm					
VTP 1 **VTP 2**	max. pressure 1,000 mbar max. flow 9 l/min max. pressure 1,650 mbar max. flow 12 l/min	+ +	Required only where application demands a higher pressure than that delivered by the internal pump to maintain flow		

ORDERING INFORMATION:

Catalogue number matches the name of the product

Optima™ Series, Water Bath Accessories

ACCESSORIES

	Lids to help reduce evaporation/heat loss and avoid sample contamination	**Polypropylene spheres** (no. of packs required, 300 spheres in one pack)	**Rack systems** to optimise use of available bath capacity (no. of racks accommodated)	**Raised shelves** to allow shallow vessels to be accommodated	**Accessory cooling systems** to allow systems to operate at or below room temperature by means of cooling coil dipped into the bath; designed for minimal impact on working area		
					Refrigerated immersion coolers Consist of a cooling coil connected to a refrigeration unit by a flexible pipe. Extract heat continuously, with the bath control unit controlling temperature		**Heat exchange coil** Designed to be attached to a supply of cooling tap water or a refrigerated circulator
					C1G (0 to 40°C)	C2G (–15 to 40°C)	CW5 (2°C above coolant temperature)
ST5 – 5 L stainless steel	**STL5** flat stainless steel	1 ×PS20	1 × QR	—		—	
ST12 – 12 L stainless steel	**STL12** gabled, hinged (removable) stainless steel	1 × PS20	2 × VR	RS14		—	
ST18 – 18 L stainless steel	**STL26** gabled, hinged (removable) stainless steel	2 × PS20	4 × **VR**	RS22		—	
ST26 – 26 L stainless steel	**STL26** gabled, hinged (removable) stainless steel	2 x PS20	4 × VR	RS28			
ST38 – 38 L stainless steel	**STL38** gabled, hinged (removable) stainless steel	3 × PS20	6 × VR	RS28 or RS38			
P5 – 5 L plastic	**PL5** flat, stainless steel	1 × PS20	1 × QR	—	—	—	—
P12 – 12 L plastic	**PL12** curved plastic	1 × PS20	2 × VR	RS14	—	—	—
P18 – 18 L plastic	**PL18** curved plastic	2 × PS20	4 × VR	RS22	—		—

ORDERING INFORMATION

Catalogue number matches the name of the device

LT ecocool™

Energy Efficient Refrigerated / Heating Circulating Baths

DESCRIPTION

- Choice of three models, temperature range -30 °C to +200 °C (model dependent);
- Industry-leading 4 year warranty with renowned service and support, no registration required;
- Active cooling through the whole temperature range;
- True energy saving of up to 80% against standard compressor units.

A new range of innovative, eco-friendly, refrigerated heating circulating baths offering significant running cost savings whilst delivering powerful cooling.

All products in the LT ecocool™ range are supplied assembled as ready to use kits, complete with accessory hosing, clips and connectors as standard.

SPECIFICATIONS

29 kg H: 640 mm D: 430 mm W: 245 mm		LT ecocool™ 100	LT ecocool™150
Temperature range	°C	–20 to 100	–25 to 150
Temperature stability	°C	±0.05	±0.02
Flow rate (max)	l/min	17	14–22 (adjustable)
Pump pressure (max)	mbar	250	530
Tank volume	l	5	6
Calibration points		2	5
Cooling power (typical)	@ 20°C W	240	385
	@ 0°C W	200	205
	@ –10°C W	100	105
	@ –20°C W	30	60
Programs		—	1 × 30 segments via Labwise™
Communication interface		—	USB
Temperature probe socket		—	6 pin mini DIN
Display		4 digit LED	Full colour QVGA TFT
Languages		—	5 (EN, FR, DE, IT, ES)
Weight	kg	29	
Timer		1 min to 99 h 59 min	
Temperature presets		3	
Alarms		High	High and low
Electrical power (max) kW	120V/230V	2.16/2.07 (50–60 Hz)	2.28/2.76 (50–60 Hz)
Safety		Adjustable over temperature cut-out	
Ready to use kits	Assembled and supplied with standard tubing, insulation, clips and connectors		

LT ecocool™

Energy Efficient Refrigerated / Heating Circulating Baths

APPLICATIONS

- **PHARMACEUTICAL** — Mini pilot plant reactors
- **EDUCATION** — Rotary evaporator cooling, replacement of running tap water cooling, immersing small samples, photometry, chromatography systems
- **INDUSTRIAL** — QC testing, sample preparation, general cooling, reaction chemistry, temperature control, semi-conductor manufacturing, rheometry
- **FOOD** — Refractometry
- **LIFE-SCIENCE** — Electrophoresis cooling
- **HIGH TEMPERATURE COOLING** — Active up to 200°C

Options and accessories	LT ecocool™ 100	LT ecocool™150
Labwise™ PC software (optional)		
Allows two-way communication for status display, programming and data capture + USB cable provided	—	
External probes (optional)		
PEP plastic probe	—	+
SEP stainless steel probe	—	+
Vertical turbine pumps (optional) when pump is fitted, available working area is reduced.		
Low noise, compact design. Supplied with pipe connections and special lid for fitting to tank, pipe bore 12.7 mm		Required only where application demands higher pressure than that delivered by the internal to maintain flow. Note: The optional VTP pumps will transfer additional heat to the baths and reduce the net cooling power of the refrigeration unit. The above figures must be taken into consideration when choosing the refrigeration unit, when ordering a VTP pump, please specify which refrigeration base unit it is to be used with. Note: Other sizes of heat exchange coil can be made to your specification. Contact us for further information.
VTP1-LT max. pressure 1,000 mbar; max. flow 9 l/min		
VTP2-LT max. pressure 1,650 mbar; max. flow 12 l/min		
Hose Kits		
HOSE100 General purpose hose kit: –40 to 100 ˚C HOSE200 High temperature hose kit: –50 to 200 ˚C		Hose kit 2 × 2 m, assembled with Optima™ pump outlet plate and simple hose clips, no tools required.

Optima™ R series,
Refrigerated Thermostatic Baths and Circulators

TXF200-R4 TXF200-R5

Cost-effective and efficient multi-purpose systems for low-temperature applications.

- Powerful precision cooling, whether used in open-loop or closed-loop format
- Combining legendary quality, reliability and design for everyday usage — useful features, straightforward maintenance, compact design
- Robust, durable construction for longevity, reliability and long-term low cost of ownership
- Up to 4 years warranty

We recommend using the following liquids with refrigerated thermostatic baths and circulators:

- **–50 to 50°C:** Silicone oil — low viscosity (Bayer silicone M3);
- **–30 to 30°C:** 50% water 50% antifreeze (inhibited ethylene glycol);
- **0 to 30°C:** 80% water 20% antifreeze (inhibited ethylene glycol);
- **5 to 99.9°C:** Water.

Grant low-temperature circulators provide a source of precision cooling for many sensitive analytical procedures, including spectrophotometry, viscometry, refractometry and electrophoresis. They are suitable for use in both open and closed-loop circulation (i.e. remote vessel open or closed).

Alternatively, Grant RC series of recirculating chillers (closed circulators) can be used. These are generally needed for more powerful cooling requirements, e.g. the removal of mechanical or electrical heat produced in apparatus or machinery. Please contact marketing@biosan.lv for advice.

Model selection:

The R4 and R5 refrigeration ranges consist of two refrigeration units which can be combined with four heating circulators to offer a temperature range of –47°C to 100°C.

Capacity (l) Outer tank dimensions	• Working area (L×W) • Min/max liquid depths • Weight	**T100** H: 333 mm D: 172 mm W: 120 mm	**TC120** H: 333 mm D: 172 mm W: 141 mm	**TX150** H: 342 mm D: 172 mm W: 141 mm	**TXF200** H: 342 mm D: 172 mm W: 141 mm
R4 – 20 l stainless steel H: 550 mm D: 515 mm W: 393 mm; *Cat.num.: R4*	• 230 × 305 mm • 80/140 mm • 40.6 kg	T100–R4 0°C to 100°C	TC120–R4 –25°C to 100°C	TX150–R4 –30°C to 100°C	TXF200–R4 –30°C to 100°C
R5 – 12 L stainless steel H: 610 mm D: 590 mm W: 414 mm; *Cat.num.: R5*	• 260 × 115 mm • 120/180 mm • 48.3 kg	T100–R5 0°C to 100°C	TC120–R5 –25°C to 100°C	TX150–R5 –47°C to 100°C	TXF200–R5 –47°C to 100°C
Options and accessories					
Labwise™ PC software (optional)					
Allows two-way communication for status display, programming and data capture + USB cable provided		—	—	+	+
External probes (optional)					
TXPEP flexible plastic probe, 3 m cable TXSEP stainless steel probe, 3 m cable		— —	— —	+ +	+ +
Remote switching device (optional)					
For switching mains power appliances on and off (up to max. 8 Amps)		—	—	1	1
Vertical turbine pumps (optional)					
Low noise, compact design. Supplied with pipe connections and special lid for fitting to tank, pipe bore 12.7 mm			Required only where application demands a higher pressure than that delivered by the internal pump to maintain flow		
VTP 1 max. pressure 1,000 mbar; max. flow 9 l/min		+			
VTP 2 max. pressure 1,650 mbar; max. flow 12 l/min		+			

MAGNETIC STIRRERS, OVERHEAD STIRRER

Intelli-Stirrer MSH-300i

Magnetic Stirrer with hot plate

MMS-3000

High speed magnetic stirrer

MM-1000

Overhead Stirrer Multi Mixer

Catalogue 2021

MS-3000 and **MMS-3000,** Magnetic Stirrers

DESCRIPTION

MS-3000 and **MMS-3000** are compact magnetic stirrers with stainless steel working surface. Units provide stirring of liquids with the rotation speed of magnetic element up to 3,000 rpm. Up to date, it is the highest value of the maximal speed for magnetic stirrers of global producers.

Strong magnets hold the driven magnetic element firmly in the magnetic clutch. Stirring is performed without undesirable heating and noise.

Enclosures of stirrer **MS-3000** are made of strong steel and painted with powder enamel, which is chemically resistant to acids and alkali.

The stirrers are supplied with a cylinder-shaped magnetic stirring bar (6×25 mm) encapsulated in PTFE for universal use.

MMS-3000 is equipped with a detachable stand for supporting various sensor elements (temperature, pH and others) inside the stirred liquid.

Magnetic stirrer is an ideal laboratory instrument for PH-metering, extraction and dialysing with small quantities of substances.

Operation temperature range +4°C to +40°C (from cold rooms to incubators) at maximal relative humidity 80%.

Basic Plus
Product Class

Basic Plus
Product Class

MS-3000 and MMS-3000, Magnetic Stirrers

SPECIFICATIONS

	MS-3000	MMS-3000
Speed control range	0–3,000 rpm	
Stirring volume up to (H_2O)	5 L	20 L
Working surface material	Stainless steel	
SR-1, attachable stand size	—	Ø 8 × 320 mm
Max. length of magnetic stirring element (bar)	50 mm	70 mm
Stirring liquid viscosity	up to 1,170 mPa×s	
Maximum continuous operation time	24 h	
Operation in closed laboratory rooms	at ambient temperature from +4°C to +40°C	
Working plate size	110 × 110 mm	Ø 160 mm
Overall dimensions (W×D×H)	120 × 150 × 65 mm	185 × 230 × 75 mm
Weight	0.8 kg	1.5 kg
Input current/power consumption	12 V, 220 mA / 2.6 W	12 V, 250 mA / 3 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V	

MMS-3000

MMS-3000

ORDERING INFORMATION:

	Cat. number
MS-3000 white	BS-010301-AAF
MS-3000 blue (on request)	BS-010301-ABF
MMS-3000	BS-010305-AAF

Optional accessories for MMS-3000:

HTP-1, Holder for temperature probe (see page 85)	BS-010309-FK

MSH-300 and Intelli-Stirrer MSH-300i, Magnetic Stirrers with hot plate

DESCRIPTION

MSH-300 and **Intelli-Stirrer MSH-300i** are magnetic stirrers of the new generation. Enclosures of stirrers are made of metal painted with powder enamel chemically resistant to acids and alkali. The stirrers are equipped with a detachable stand for supporting various sensor elements (temperature, pH and others) inside the stirred liquid.

The stirrers are supplied with a cylinder-shaped magnetic stirring bar (6×25 mm) for universal use covered with Teflon.

Units are equipped with overheat protection providing an automatic switch-off of the device when overheating for the set temperature difference occurs.

Magnetic stirrers with heating can be used for laboratory operations such as organic synthesis, extraction, analysis of oil products, pH-measurements, dialysis, soil suspending, preparing buffer solutions, etc.

Additional protection disables the heating if the temperature of the plate exceeds the set temperature for 30°C.

Operation temperature range +4°C to +40°C (from cold rooms to incubators) at maximal relative humidity 80%.

Product video is available on the website

Basic Plus
Product Class

MSH-300 with the stand

DESCRIPTION

Intelli-Stirrer MSH-300i is a digital version of magnetic stirrer with heating; it is designed for laboratories with higher requirements. It offers digital setting and control of temperature and rotation speed.

A powerful magnet allows mixing solutions with glycerine viscosity level. Maximum volume of stirred liquid (water) is 20 litres.

An external probe provides direct control of the stirred liquids temperature.

External temperature probe:

Probe type	thermocouple
Connection	type K
The cable is covered with Teflon, mechanically strong, elastic and chemically stable against oils, acids, aggressive reagents and liquids	
Cable length	1 m
Operation temperature range	–50°C to +250°C

Premium
Product Class

Intelli-Stirrer MSH-300i with the stand, external probe and holder for temperature probe

MSH-300 and Intelli-Stirrer MSH-300i, Magnetic Stirrers with hot plate

SPECIFICATIONS

	MSH-300	Intelli-Stirrer MSH-300i
Speed control range	250–1,250 rpm	100–1,250 rpm (10 rpm increment)
Max. stirring volume (H_2O)	15 L	20 L
Plate temperature regulation range	+30°C ... +330°C	+30°C ... +330°C (1°C increment)
Temperature control range with external probe	—	20 °C ... +150°C
Display	—	LCD
Temperature uniformity on the plate	±3°C	
Working plate heating time till 330°C	15 min	11 min
Diameter of working plate	160 mm	
Plate material	Aluminium alloy	
SR-1, attachable stand size	Ø 8×320 mm	
Length of magnetic stirring element	10–50 mm	20–70 mm
Max. stirring liquid viscosity	up to 1,170 mPa·s	
Maximum continuous operation time	24 h	168 h
Fault indication	Outputs sound signal and turns off the heating	Outputs an error code on display, turns off the heating
Overall dimensions (W×D×H)	190 × 270 × 100 mm	
Weight	2.9 kg	3.2 kg
Nominal operating voltage	230 V; 50/60 Hz or 120 V; 50/60 Hz	
Power consumption (Stirring)	8.5 W	
Power consumption (Heating)	550 W	

Connecting external probe to the Intelli-Stirrer MSH-300i

External sensor installation:

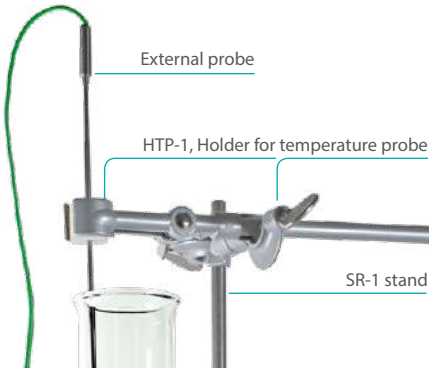


Plate heat up time for **MSH-300:**

from 25°C — 15 min — to 330°C

Plate heat up time for Intelli-Stirrer **MSH-300i:**

from 25°C — 11 min — to 330°C

ORDERING INFORMATION:

	Cat. number
MSH-300 with stand	BS-010302-OAA
Intelli-Stirrer MSH-300i with stand	BS-010309-AAA

Optional accessories:

External temperature probe	BS-010309-BK
HTP-1, holder for temperature probe	BS-010309-FK

MM-1000, Overhead Stirrer Multi Mixer

DESCRIPTION

Overhead Stirrer Multi Mixer **MM-1000** is designed for stirring liquids up to 20 litres. Quiet and reliable mixer can provide stable continuous mixing up to seven days. It can realise three types of motion:

1. **Rotational**
2. **Reciprocal**
3. **Vibration**.

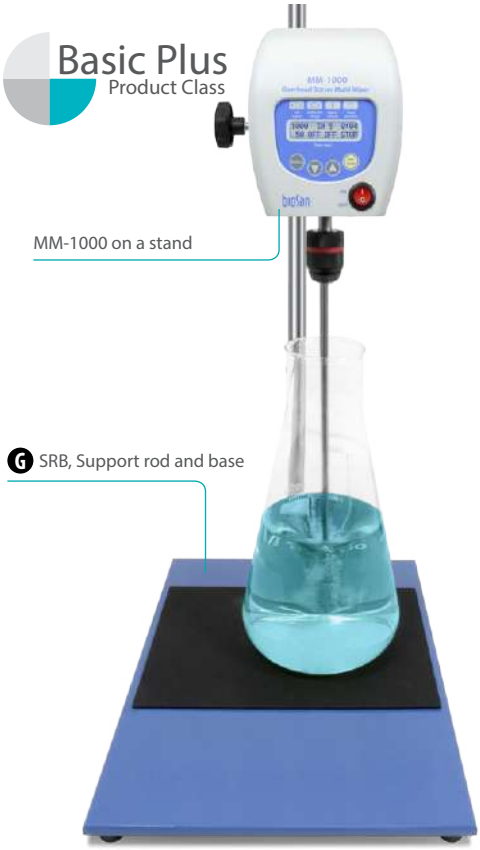
MM-1000 performs separate (mono–) (1; 2; 3), consecutive binary cycles *(c)* (1–2) × *c*; (1–3) × *c* and (2–3) × *c* and complex tri-cycles (1–2–3) × *c*.

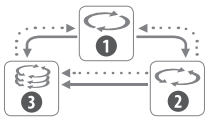
Speed, angle and time of stirrer rotation are under microprocessor control.

Multi Mixer can be used for stirring solutions up to the "medium viscosity" range (from 1,000 to 10,000 mPa·s). It is an ideal instrument for biotechnology, organic synthesis, analytical laboratories.

The innovative combination of three motion types provides a high level of homogeneity due to consecutive combination of laminar and turbulent flows that cause substances to dissolve faster.

Electrically safe and energy efficient — powered by 12 V external power supply.





Multi mixing

SPECIFICATIONS

Specifications of movement types:

1 Rotation:	
Speed regulation range	40–1,000 rpm
Time	0–250 s
2 Reciprocal motion:	
Turning angle	0°–360° (increment 30°)
Time	0–250 s
3 Vibro motion:	
Turning angle	0°–5° (increment 1°)
Timer	0–5 s
Timer sound signal	yes
Stirring volume up to (H_2O)	20 L
Digital time setting	1 min–96 h/non-stop (increment 1 min)
Overall dimensions (W×D×H)	140 × 135 × 250 mm
Weight	2.4 kg
Input current/power consumption	12 V, 700 mA / 8.4 W
External power supply	Input AC 100–240 V 50/60 Hz, Output DC 12 V

Accessories for MM-1000

ORDERING INFORMATION:

	Cat. number
MM-1000 without stirrers	BS-010306-AAH

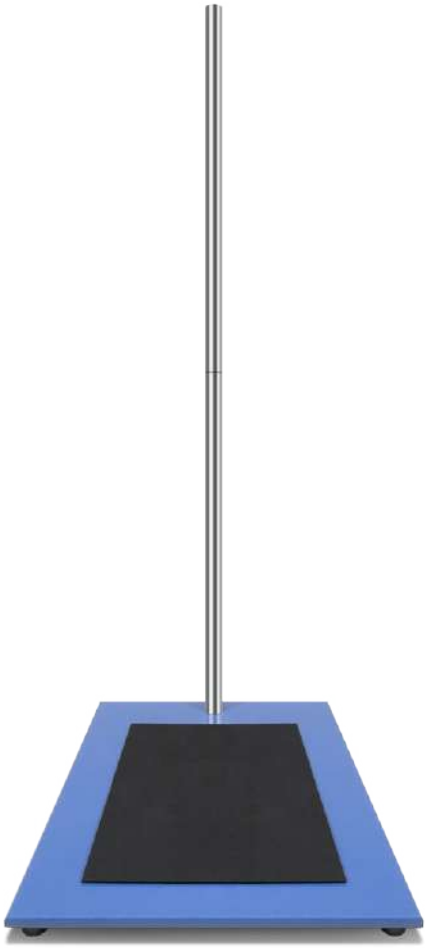
Optional accessories:	Type	Dimensions	Cat. number
A **MP-1**	Paddle stirrer	378 × (70 × 70) × 8 mm	BS-010306-AK
B **MP-2**	Propeller stirrer	2 folding blades (326 × 55 × 8 mm)	BS-010306-BK
C **MP-3**	Propeller stirrer	3 folding blades (325 × 50 × 8 mm)	BS-010306-CK
D **MA-1**	Anchor stirrer	332 × 90 × 8 mm	BS-010306-DK
E **MC-1**	Centrifugal stirrer	358 × 60 (110) × 8 mm	BS-010306-EK
F **Double clamp**	—	For device mounting	VELA00001301
G **SRB,** Support rod and base	—	For device mounting, 285 × 375 × 840 mm	BS-010306-KK

A MP-1

B MP-2

C MP-3

G SRB, Support rod and base



D MA-1

E MC-1

F Double clamp

BIOSAFETY EQUIPMENT:

BIOSAFETY AIR, BIOSAFETY SURFACE, WATER PURIFICATION SYSTEMS

UVC/T-M-AR

DNA/RNA UV-cleaner box

UVT-S-AR

DNA/RNA UV-cleaner box

UVR-Mi

UV Cleaner–Recirculator

Catalogue 2021

UVR-M and UVR-Mi, UV Cleaner–Recirculators

DESCRIPTION

How does UV-Air Flow Cleaner-Recirculator work?

Operation principle is based on a constant, forced air circulation through recirculator`s chamber in close vicinity to UV lamps, thus ensuring maximal efficiency of disinfection. The inner mirror surface of the recirculator chamber reflects ultraviolet rays thereby increasing the UV radiation density and enhancing the disinfection effect.

What does UV Air Flow Cleaner-Recirculator consist of?

UV Air Flow Cleaner-Recirculator consists of a germicidal UV lamp, a fan unit equipped with dust filters and a control unit confined in a flow-through chamber.

What are the Benefits of UVR-M and UVR-Mi recirculators?

- UV Air Recirculators are ideal for air disinfection in hospitals (especially in outpatient departments, operating rooms, emergency rooms, delivery rooms etc.), kindergartens, research laboratories, veterinary clinics
- Recirculators are effective against common airborne diseases by disinfecting the air and efficiently destroying disease-causing agents (viruses, microorganisms) by UV radiation
- Provide complete protection from UV radiation
- Easy to install, operate and maintain. Very low noise level
- Built-in timer allows controlling the UV lamp operating time (UVR-Mi model)
- Digital control unit allows tracking overall UV lamp operating time (UVR-Mi model)

Recirculator fixation:

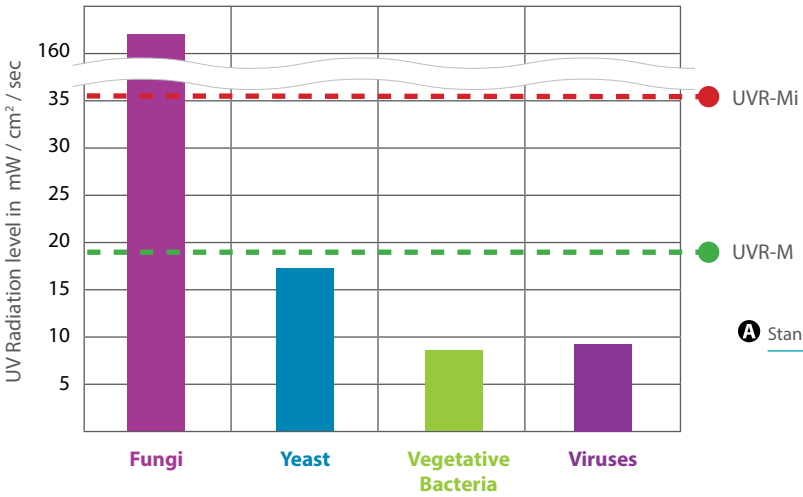
- Convenient fixation on walls (standard)
- Mounting on a movable stand (optional) Ⓐ

Basic Plus Product Class

Premium Product Class

Both product videos are available on the website

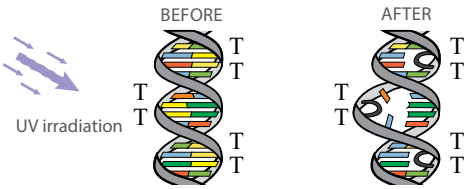
Sensitivity of microorganisms to UV radiation intensity in UV air recirculators UVR-M and UVR-Mi



UVR-M and UVR-Mi, UV Cleaner–Recirculators

	UVR-M	UVR-Mi
UV radiation source bactericidal UV-C, TUV 25W 1SL/25	1 lamp	2 lamps
UV radiation level	18 mW/cm²/s	36 mW/cm²/s
Air-flow productivity	14 m³/h	
Full user protection from direct UV light	Yes	
Display	—	LCD
UV lamp operation indicator	Yes	Yes
UV lamp lifetime counter	—	Yes
Timer	—	1 min–24 h/non-stop
Automatic switch ON/OFF	—	Yes
Lamp fault detection	—	Yes
Overall dimensions (W×D×H)	110 × 135 × 660 mm	110 × 135 × 660 mm
Weight	3.4 kg	3.4 kg
Nominal operating voltage	230 V, 50 Hz or 120 V, 60 Hz	230 V, 50 Hz
Power consumption (230/120 V)	125 VA (540 mA)/160 VA (1.3 A)	110 W (0.5 A)

Operation principle



T — thymine formations

ORDERING INFORMATION:

	Cat. number
UVR-M	BS-040105-AAA
UVR-Mi	BS-040110-AAA
Optional adapters:	
UVR-S (stand)	BS-040105-AK

See UVR-M and UVR-Mi, UV-air flow Cleaner-Recirculators Test Report on web page biosan.lv/uvr-test

UVC/T-AR, UVC/T-M-AR, UVT-B-AR and UVT-S-AR
DNA/RNA UV-Cleaner Boxes

DESCRIPTION

DNA/RNA UV-cleaner boxes (**UVC/T-AR, UVC/T-M-AR, UVT-B-AR** and **UVT-S-AR**) are designed for clean operations with DNA samples. They provide protection against contamination.

All models are bench-top type, made of metal framework, glass (or plexiglass) walls and working surface painted with powder enamel or made of stainless steel (See the specifications table on page 94).

UV-cleaner boxes are equipped with an open UV lamp installed in the upper hood. UV-radiation from the open lamps disinfects the working area inactivating DNA/RNA fragments during 15–30 min of exposure. A digital timer controls the duration of the direct UV irradiation. A daylight lamp provides proper illumination of the working surface.

UV-cleaner box is equipped with a flow-type bactericidal **UV cleaner–recirculator AR**, which provides constant decontamination inside the box during operation. They are recommended for operations with DNA/RNA amplicons.

UV cleaner-recirculator AR consists of a UV lamp, a fan and dust filters organized in a special body to protect a user working with a UV-cleaner box against UV light. Recirculator increases the maximum density of UV light, making it sufficiently effective for DNA/RNA inactivation. The UV–recirculator processes 100 UV-cleaner box volumes per hour, creating permanent aseptic operation conditions inside the UV-cleaner box.

Development and evaluation of DNA amplicon quantification video is available on the website

Advantages of Biosan UV-cleaner boxes:

- Ozone free high-density UV decontamination
- Long living UV lamps (9,000 hours average)
- Automatic switching off of UV-lamps when the protective screen is opened
- Bactericidal flow-type recirculator providing permanent decontamination inside UV-cleaner box during operation
- Shockproof glass walls
- Low noise, low energy consumption
- Tables for installation of UV-cleaner boxes
- UV-cleaner boxes with the bactericidal **UV cleaner–recirculator AR** is the patented Biosan solution

Premium
Product Class

UVC/T-M-AR

Basic Plus
Product Class

UVC/T-AR

Basic Plus
Product Class

UVT-B-AR

UVC/T-AR, UVC/T-M-AR, UVT-B-AR and UVT-S-AR
DNA/RNA UV-Cleaner Boxes

Premium
Product Class

DNA/RNA UV-cleaner box UVT-S-AR with equipment for nucleic acid extraction

Product video is available on the website

P-5, F-1, Shelves for DNA/RNA UV-cleaner boxes

A P-5, shelf for pipettes

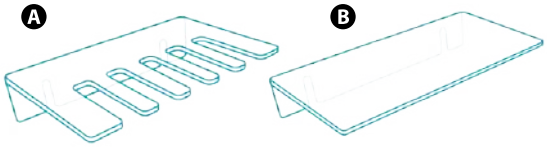
B F-1, shelf

Two types of shelves have been developed for DNA/RNA UV-cleaner boxes to increase the effective area of the box: **P-5** — shelf-holder for five pipettes and **F-1** flat shelf.

On the **F-1** shelf, you can place laboratory glassware, reagents and other items that are convenient to keep in close proximity.

A **P-5**, shelf for pipettes:	
Dimension (W×D)	230 × 140 mm
Capacity	5 pipettes

B **F-1**, shelf:	
Dimension (W×D)	400 × 140 mm



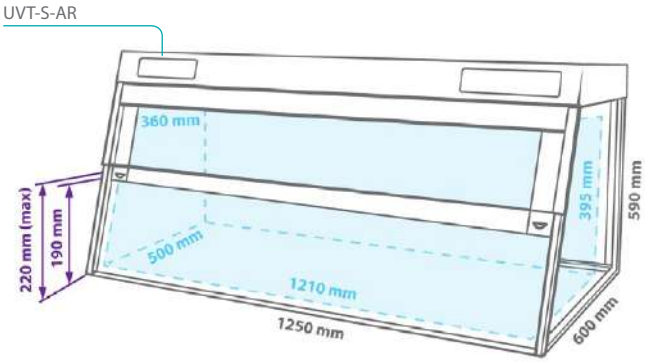
ORDERING INFORMATION:	Cat. number
UVC/T-AR with inlet	BS-040102-AAA
UVT-B-AR with internal socket and inlet	BS-040109-A06
UVC/T-M-AR with internal socket and inlet	BS-040104-A06
UVT-S-AR with internal sockets and inlet	BS-040107-AAA

Accessories:	Cat. number
P-5, shelf for pipettes	BS-040104-DK
F-1, shelf	BS-040104-CK

UVC/T-AR, UVC/T-M-AR, UVT-B-AR and UVT-S-AR
DNA/RNA UV-Cleaner Boxes

SPECIFICATIONS

Model	**UVT-S-AR** (double size)
Wall materials	Rear: stainless steel. Sides and front: glass (EUROGLASS,Germany)
Working surface material	Stainless steel
Open UV-lamp	2×30 W built-in bactericidal UV-C, TUV 30W 1SL/25
Recirculator UV radiation level	18 mW/cm²/s
Radiation type	UV (λ = 253.7 nm), ozone-free
Digital time setting of direct UV exposure	1 min–24 h/non-stop (increment 1 min)
UV–recirculator	1×30W (efficiency >99% per 1 h)
Daylight lamp (for working area illumination)	1×TLD-30W
Thickness of side panels	4 mm
Thickness of upper front panel	8 mm
Thickness of the front protective screen	5 mm
Optical transmission	95%
UV protection	>96% UV-protection film, type 4 mil, clear
Working area dimensions	1,210 × 500 mm
Opening size (W×H, fully raised protective screen)	1,185 × 190 mm
Safety features	Automatic open UV-lamp switching off when screen is open
Power outlets inside the unit (230/120 V)	3 built-in sockets max. 1000 W/600 W, Inlet for power cords
Nominal operating voltage	100–240 V, 50/60 Hz
Power consumption	135 W
Overall dimensions(W×D×H)	1250 × 600 × 590 mm
Weight (net/gross)	58/68,5 kg
Optional table	**T-4L** (W×D×H : 1290 × 600 × 770 mm)

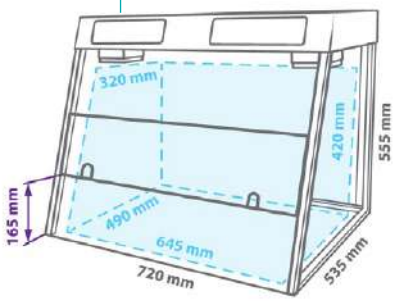


UVC/T-AR, UVC/T-M-AR, UVT-B-AR and UVT-S-AR
DNA/RNA UV-Cleaner Boxes

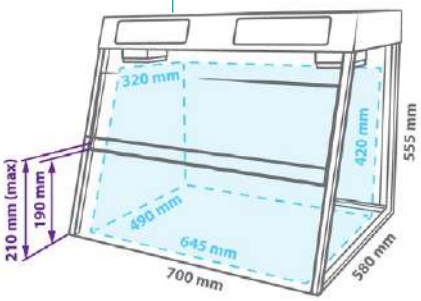
UVC/T-AR (compact)	**UVC/T-M-AR** (compact)	**UVT-B-AR** (compact)
Plexiglass: Polymethyl methacrylate (ALTUGLAS EX)	Rear: stainless steel. Sides and front: glass (EUROGLASS, Germany)	Rear: stainless steel. Sides: steel with chemical resistant powder coating. Front: glass (EUROGLASS,Germany)
Steel with chemical resistant powder coating	Stainless steel	
1 × 25 W built-in bactericidal UV-C, TUV 25W 1SL/25		
18 mW/cm²/s		
UV (λ = 253.7 nm), ozone-free		
1 min–24 h/non-stop (increment 1 min)		
1 × 25W (efficiency >99% per 1 h)		
1 × TLD-15W		
4 mm	4 mm	2 mm
8 mm		
8 mm	4 mm	4 mm
92%	95%	
>99.90% Polymethyl methacrylate ALTUGLAS EX	>96% UV-protection film, type 4 mil, clear	
645 × 490 mm		
645 × 165 mm	630 × 190 mm	
Automatic open UV-lamp switching off when screen is open		
Inlet for power cords	Inlet for power cords and 1 built-in socket, max. 1,000 W/600 W	
100–240 V, 50/60 Hz		
67 W		
720 × 535 × 555 mm	700 × 580 × 555 mm	
23/33 kg	28,8/39 kg	31,2/42 kg
T-4 (W × D × H : 800 × 600 × 745 mm)		

SPECIFICATIONS

UVC/T-AR

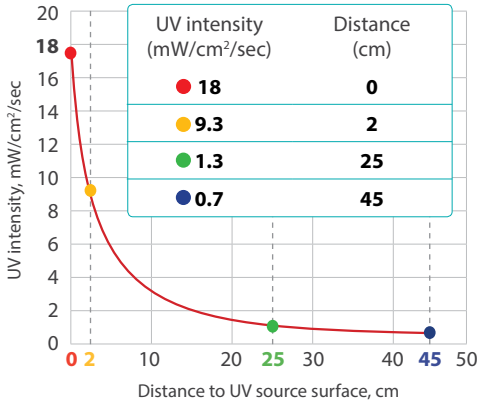


UVC/T-M-AR, UVT-B-AR

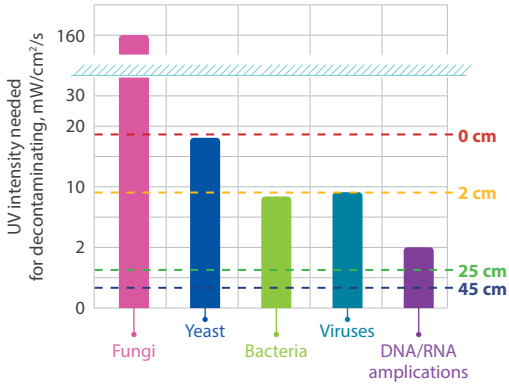


UVC/T-AR, UVC/T-M-AR, UVT-B-AR and UVT-S-AR
DNA/RNA UV-Cleaner Boxes

Germicidal, shortwave (254 nm) ultraviolet energy is used for complete destruction of various biological agents



PER 1 SECOND



Average dosage for different surfaces

Surface	Dosage after 15 min	Dosage after 30 min
Working surface (40–50 cm)	570–680 mW/cm²	1140–1360 mW/cm²
Side walls (10–50 cm)	570–2500 mW/cm²	1140–5000 mW/cm²
Front window (10–50 cm)	570–2500 mW/cm²	1140–5000 mW/cm²

More information

biosan.lv/uv-box

PDS-250 and PDS-10L, DNA/RNA decontamination solution

DESCRIPTION

Contamination is especially problematic in the highly sensitive PCR technique. Originating from aerosolized fragments, contaminant DNA can lead to cross-contamination, thus resulting in inaccurate data and, as a result, misinterpreted analysis.

PDS is a ready-to-use solution for eliminating DNA and RNA from the surface prior PCR reaction preparation. DNA/RNA is removed within seconds after use. The solution contains a non-alkaline and non-carcinogenic agent. **PDS** is intended for use at PCR cabinets and laminars (e.g. UVT-S-AR), lab devices — BioMagPure 12, TS-100, pipettors — Assist series pipettes, etc.

PDS is effective against amplicon, plasmid, or genomic DNA and RNA from most surfaces except light or non-ferrous metals (e.g. aluminium, copper, lead, nickel, tin, titanium, zinc etc.).

The use of **PDS** both before and after PCR analysis is fast, easy and ideal to maintain a clean work area, thereby saving time and expenses.

PDS is heat resistant and stable for several years.

The decontamination solution is also available in 10 l containers — **PDS-10L.**

ORDERING INFORMATION:

	Cat. number
PDS-250, DNA/RNA decontamination solution, spray 250 ml	BS-040107-DK
PDS-10L, DNA/RNA decontamination solution, 10 l	BS-040107-FK

Laboratory furniture

Modular design of laboratory furniture provides flexibility and ease of use.

A T-4, table

B T-4L, table

C LF-1, laboratory chest of drawers

A **T-4**, table for — UVC/T-AR, UVC/T-M-AR, UVT-B-AR	
Maximum load	50 kg
Drawers	1
Mobility	Wheels with brakes
Material	Laminated particle board
Overall dimensions (W×D×H)	800 × 600 × 745 mm
Weight	23 kg

B **T-4L**, table for — UVT-S-AR	
Maximum load	75 kg
Drawers	1
Mobility	Wheels with brakes
Material	Laminated particle board
Overall dimensions (W×D×H)	1290 × 600 × 770 mm
Weight	36 kg

C **LF-1**, laboratory chest of drawers	
Drawers	5
Mobility	Wheels with brakes
Material	Laminated particle board
Overall dimensions (W×D×H)	300 × 450 × 705 mm
Weight	28 kg

UVT-S-AR on T-4L table with two LF-1 laboratory chests

ORDERING INFORMATION:	Cat. number
T-4, table	BS-040101-BK
T-4L, table	BS-040107-BK
LF-1, laboratory chest of drawers	BS-050101-BK

Ultrapure water systems: **Labaqua series** NEW

DESCRIPTION

Labaqua ultrapure systems are multi-purpose water purification systems. The Labaqua systems produce ultrapure and pure water directly from tap water.

Ultrapure (Grade 1) water is dispensed through the point-of-use filter on the front panel. Pure (Grade 2) water is dispensed directly from the storage tank.

Labaqua ultrapure water can be used for the most demanding applications, including, but not limited to: Inorganic trace analysis, Liquid chromatography, Cell culture, Molecular biology.

With resistivity of 18.2 Mega — Ohm × cm (0.055 µS/cm), ultrapure water produced by a Labaqua system exceeds requirements of all relevant standards (ISO 3696 Grade 1, ASTM Type I, CLSI Type I). Purified water is collected in a storage tank. An integrated recirculation system ensures consistent quality of water and reduces total organic carbon (TOC) to very low levels: <2ppb.

Pure water produced by the Labaqua systems complies with ISO 3696 Grade 2 water requirements and can be used for labware washing, wet chemistry methods, flame spectrophotometers, etc.

All cartridges and filters are easily accessible, and no tools are required to replace them. The Labaqua system can be installed on a laboratory bench or mounted on a wall.

FEATURES:

- **Volumetric dispense** — enables the user to set accurate dispensing volume for each dispense cycle. The dispense volume can be set either from the keyboard or by using the "teaching" mode.
- **Water quality** — embedded recirculation loop ensures stable premium water quality and enables practical elimination of Total Organic Carbon (TOC).
- **Low running costs** — performance of the deionization and polishing modules is constantly monitored. Monitoring algorithm enables cutting running costs, as replacement of the modules is requested only when service life is close to the end.
- **Total organic carbon (TOC) monitor** — organic contaminants may not affect the conductivity of water, so conductivity sensors cannot be used for TOC monitoring. Therefore, a special TOC monitoring module is needed to measure TOC level.
- **Color graphic LCD display** — system component status is reflected on the display in an intuitive colour pattern (Green/Yellow/Red).
- **System flowchart** — shows all component status and water quality parameters at a glance.

The Labaqua systems include:

- Boost pump
- Pre-filter set
- Reverse osmosis module
- Deionization module
- Final stage polishing module
- 30 L storage tank with an integrated Grade 2 dispensing valve
- Recirculation system

Model specific modules:

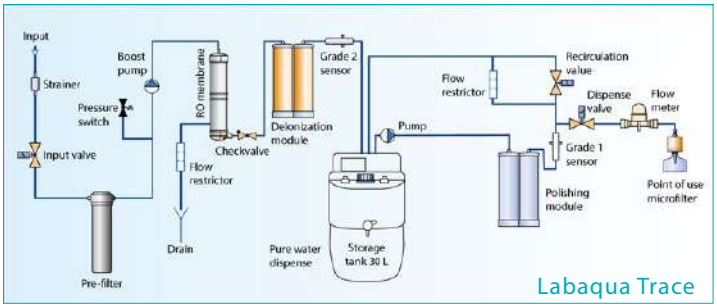
- **Labaqua Trace** — Point-of-use microfilter
- **Labaqua HPLC** — Point-of-use microfilter, TOC monitor
- **Labaqua Bio** — Point-of-use ultrafilter, UV sterilization module, TOC monitor

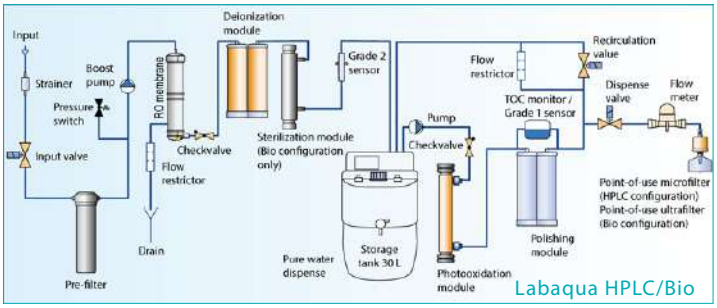
Ultrapure water systems: Labaqua series

Purified water specifications	Labaqua Trace	Labaqua HPLC	Labaqua Bio
Ultrapure (Grade 1) water resistivity	18.2 MΩ × cm		
Ultrapure (Grade 1) water conductivity	0.055 µS/cm		
Pure (Grade 2) water resistivity	>10 MΩ × cm		
Pure (Grade 2) water conductivity	<0.1 µS/cm		
TOC	<30 ppb	<2 ppb	
RNase	—	—	<0.01 ng/ml
DNase	—	—	<4 pg/ml
Bacteria	<1 CFU/ml		<0.01 CFU/ml
Endotoxins	<0.15 EU/ml		<0.001 EU/ml
Particles >0.22 µm	<1/ml		
Deionization module life (standard module)	1 m^3		
Dimensions (W×D×H)	320 × 560 × 620 mm		
Storage tank	30 l		
Feed water pressure	0.8–4 bar		
Feed water conductivity	<1,300 µS/cm		
Weight	24 kg	25 kg	26 kg
Nominal operating voltage	230 V, 50/60 Hz		
Power consumption	130 W		

	Application	Labaqua Trace	Labaqua HPLC	Labaqua Bio
General laboratory applications	Glassware rinsing	+	+	+
	Laboratory washers	+	+	+
	Autoclaves	+	+	+
	Electrochemistry	+	+	+
	Wet chemistry	+	+	+
	Spectrophotometry	+	+	+
	Buffer and media preparation	+	+	+
	Reagent preparation	+	+	+
Inorganic analysis methods	Flame atomic absorption spectrophotometry	+	+	+
	Graphite atomizer atomic absorption spectrophotometry	+	+	+
	Plasma mass-spectrometry (ICPMS)	+	+	+
	Plasma spectrophotometry (ICPOES)	+	+	+
	Ion chromatography	+	+	+
Organic analysis methodes	Liquid chromatography (HPLC/ UHPLC)		+	+
	Gas chromatography		+	+
	Total organic carbon measurements		+	+
Molecular Biology	Flow cytometry			+
	Cell and tissue culture			+
	Molecular biology			+

Ultrapure water systems: **Labaqua series**





Storage tank

ORDERING INFORMATION

	Cat. number
Labaqua Trace include 30 l tank, power cord	BS-070105-A02
Labaqua HPLC include 30 l tank, power cord	BS-070104-A02
Labaqua Bio include 30 l tank, power cord	BS-070106-A02
Optional accessories:	
External pre-filter set (polyphosphate/carbon/1 µm) with manometer	BS-070104-LK
External pre-filter set (carbon/1µm) with manometer	BS-070104-KK
Storage tank "Economy" with level switch, 50 l	BS-070102-DK
Storage tank "Comfort" with level switch, 60 l	BS-070102-EK
Storage tank "Comfort", 100 l	BS-070102-FK
Storage tank "Comfort", 200 l	BS-070102-GK
Storage tank "Comfort", 300 l	BS-070102-HK
Replacement parts	
Internal prefilter set	BS-070104-AK
Deionization module	BS-070104-IK
Polishing module	BS-070104-BK
Microfilter – 0.22 µm non sterile	BS-070104-EK
Microfilter – 0.22 µm sterile	BS-070104-FK
Ultrafilter	BS-070104-GK
UV bulb 254 nm	BS-070104-CK
UV bulb 185 nm	BS-070104-DK
0.22 µm air vent filter for the storage tank	BS-070102-AK

DENSITOMETERS, PHOTOMETER

DEN-1
Densitometer

DEN-1B
Densitometer

DEN-600
Photometer

Catalogue 2021

DEN-1 and DEN-1B, McFarland Densitometers

DESCRIPTION

Densitometers **DEN-1** and **DEN-1B** are designed for measurement of cell suspension's turbidity in the range:

0.0–6.0 McFarland units
(0–180 × 10^7 cells/ml);

Densitometers provide the opportunity to measure solution turbidity in a wider range (up to 15.0 McFarland units), however, it is necessary to remember that, in this case, the standard deviation values increase.

A densitometer is used for measurement of cell concentration (bacterial, yeast cells) during the fermentation process, determination of microorganism sensitivity to antibiotics, microorganism identification using various test-systems, for measurement of absorption at the definite wavelength, as well as for quantitative estimation of the colour solution concentration, absorbing green light.

The operation principle is based on the measurement of optical density with digital presentation of results in McFarland units. The unit is calibrated at the factory (for operation with 16 mm diameter glass tubes) and keeps calibration without power supply. However, if necessary, it is possible to calibrate the unit by 2–6 points in 0.0–6.0 McFarland unit range. Both commercial standards offered by Biosan and the cell suspensions prepared in a laboratory can be used for calibration.

Following polymer microparticles calibration kits and glass tubes are available on request:

- **CKG16** for glass tubes with diameter 16 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0 McFarland Turbidity Standards (latex particles)
- **CKG1802** for glass tubes with diameter 18 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0; 5.0 McFarland Turbidity Standards (BaSO4)
- **CKG12** for glass tubes with diameter 12 mm, set of 0.0 (blank); 0.5; 2.0; 3.0 McFarland Turbidity Standards (latex particles) (only for **DEN-1B**)
- **Glass sample tubes** without lid (diameter 16 mm, height 100 mm), which are suitable for working with **DEN-1, DEN-1B** factory calibration

Up to date information on calibration kits can be found on the website: www.biosan.lv

Two versions of the product are available:

1. **DEN-1** powered from external energy supply;
2. **DEN-1B** powered both from external energy supply and batteries (AA).

Basic Plus
Product Class

DEN-1

Premium
Product Class

DEN-1B

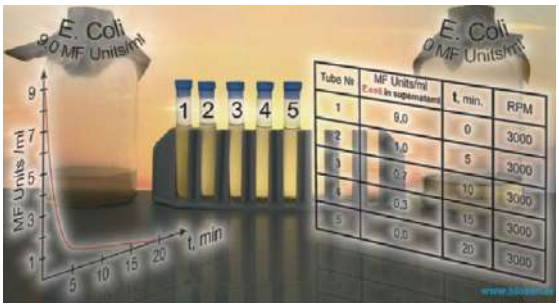
Adapter A-16

DEN-1B rear side with calibration controls

DEN-1 and DEN-1B, McFarland Densitometers

SPECIFICATIONS

	DEN-1	DEN-1B
Light source	LED	
Wavelength	λ = 565 ±15 nm	
Measurement range	0.00–15.00 McF	
Display resolution	0.01 McF	
Accuracy	(0.0–6.0 McF) ±3%	
Measurement time	1 s	
Sample volume	not less than 2 ml	
Tube external diameter	18 mm (without adapter) 16 mm (using included **A-16** adapter)	18 mm (without adapter) 16 mm (using included **A-16** adapter) 12 mm (using optional **A-12** adapter)
Possibility to restore factory calibration settings		
Display	LCD	
Overall dimensions (W × D × H)	165 × 115 × 75 mm	
Weight	0.7 kg	
Independent power supply	—	3 × AA batteries
Input current/power consumption	12 V, 7 mA/0.1 W	
External power supply	Input AC 100–240 V, 50/60 Hz, Output DC 12 V	
Standard set	Adapter A-16 External power supply	Adapter A-16 External power supply and 3 × AA batteries



Application of **DEN-1** for determining microbial cells concentration of supernatant in tubes during centrifugation. Turbidity is determined in McFarland units.

DEN-1B

ORDERING INFORMATION:

	Cat. number
DEN-1 with **A-16** adapter	BS-050102-AAF
DEN-1B with **A-16** adapter	BS-050104-AAF

Optional accessories:

A-12 adapter for 12 mm tubes (only for **DEN-1B**)	BS-050102-IK
CKG16 for glass tubes with diameter 16 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0 McF	BS-050102-BK
CKG1802 for glass tubes with diameter 18 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0; 5.0 McF	BS-050102-GK
CKG12 for glass tubes with diameter 12 mm, set of 0.5; 1.0; 2.0; 3.0 McF (only for **DEN-1B**)	BS-050102-DK
Glass sample tubes 16 mm diameter without lid (16 × 100 × 0.8 mm), 78 pcs. Fits DEN-1, DEN-1B factory calibrated	BS-050102-LK

DEN-600, Photometer NEW

DESCRIPTION

DEN-600 is a compact, portable, rechargeable battery-powered photometer. It comprises of 600 nm wavelength optical system, which enables to apply — 1) OD_{600} method estimates the total number of cells, 2) McFarland (McF) turbidity measurement method, 3) Bradford protein assay method for protein concentration measurement.

The device serves as an inexpensive alternative to a spectrophotometer commonly used for these applications. Because **DEN-600** is battery powered and compact, it can be comfortably located in a biosafety cabinet, anaerobic chamber or quickly moved to another lab room. Additionally, the vessel holding mechanism allows accommodating round bottom, conical vials or falcon tubes, therefore enabling to measure the absorbance (Abs) and turbidity in Abs, OD and McFarland units.

USB connectivity and DEN software allow for data transfer, data processing and calculation, software calibration for Bradford protein assay method or a custom calibration for a specifically applicable vessel.

Smart Plus
Product Class

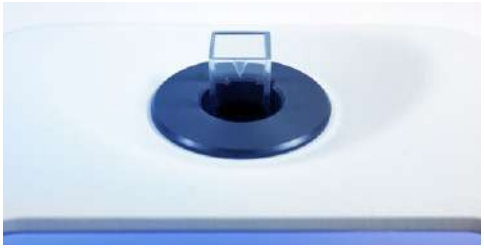
COMMON APPLICATIONS:

- Cell concentration measurement
- Cell growth data estimation
- Log phase estimation for microbial cells induction
- Competent cell preparation
- Bradford protein assay method
- Antibiotic susceptibility testing
- Inhibitory tests

SPECIFICATIONS

Light source	LED, self-calibrating
Photodetector	Silicone photodiode
Measurement wavelength (λ)	600 nm ±10 nm
Vessel type	Cuvettes, round bottom tubes, falcon tubes
Battery type	LiPo
PC system requirements:	Intel/AMD Processor, 1 GB RAM, Windows Vista/7/8/10, USB
Dimensions (W×D×H)	120 × 145 × 65 mm
Weight	0.5 kg
External power supply	Input AC 100–240 V 50/60 Hz, Output DC 12 V

Measurement modes	Absorbance	McFarland
Measurement range	0–3.0 Abs	0–16.00 McF
Resolution	0.001 Abs	0.01 McF
Accuracy	±0.006 @ 1 Abs	±0.1 @ 0–8 McF
Repeatability	±0.003 @ 1 Abs	±0.05 @ 0–8 McF



ORDERING INFORMATION

	Cat. number
DEN-600	BS-050109-AAA

ASPIRATORS, PIPETTES

Catalogue 2021

FTA-2i, Aspirator with Trap Flask

DESCRIPTION

Aspirator with trap flask **FTA-2i** is designed for aspiration or removal of alcohol, buffer and liquid from reaction vessels (e.g. during DNA/RNA purification or other macromolecule reprecipitation techniques).

The device can be applied for routine operations of cells washing from culture medium and resuspension in a buffer. Aspirator operation principle is based on creating negative pressure in trapping flask using built-in microcompressor. The collecting tip is connected with polyethylene tube to the trapping flask. Liquid is removed from the reaction vessel when the collecting tip is in contact with the solution. A tube holder-organizer is conveniently located at **FTA-2i** right-hand side; it accommodates two 1.5–2 ml tube slots (e.g. for hydrochloric acid solution and distillate) necessary for collecting tip washing and storing, so that a tip can be re-used.

FTA-2i is equipped with a level sensor that detects excess liquid with consequential prevention of the overflow by automatically switching off the pump with a sounding alarm indication.

The devices come, as standard, with a vacuum regulation control knob that allows to select a preferable aspiration speed smoothly.

Additionally, a hand operator can be purchased for a more comfortable usability of the new accessories. The autoclavable hand operator features a pressure-sensitive button that can control the aspiration speed.

Common applications:

Removal and disposal of liquid from various reaction vessels

SPECIFICATIONS

Aspiration speed	up to 10 l/min (air)
Vacuum regulation	-200 to -800 mbar (adjustable)
Trap flask	2 l, polypropylene (autoclavable)
Liquid level sensor type	Invasive
Timer sound signal	yes
Overflow protection	Motor stops, light and sound signal
Filtration: Hydrophobic microbiologic filter 2200/02 eliminates risk of contamination from the trap flask by bacteria, viruses and infected particles	
Filter pore diameter	0.027 micron
Input current/power consumption	12 V, 1 A/10.8 W
External power supply	Input AC 100–240V 50/60 Hz; Output DC 12 V
Dimensions (W×D×H)	185 × 290 × 390 mm
Weight*	1.85 kg

* — Accurate within ±10%.

Premium Product Class

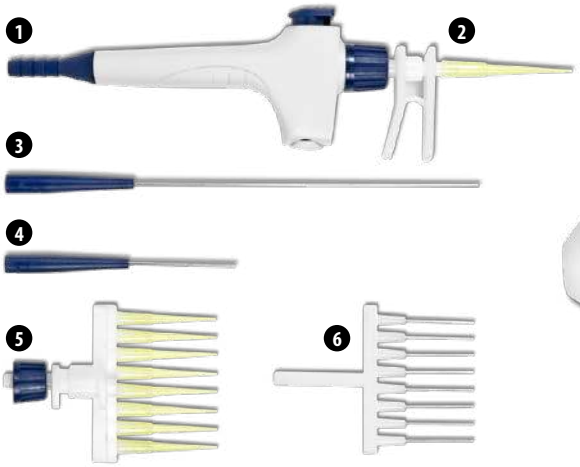
Product video is available on the website

FTA-2i, Aspirator with Trap Flask

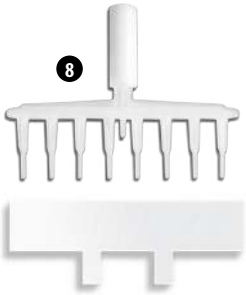
Optional accessories:

HAS-1, hand operator set

1. Handheld vacuum controller;
2. 1-channel adapter (with ejector) for 200 µL tips;
3. 1-channel adapter with 125 mm stainless steel pin;
4. 1-channel adapter with 40 mm stainless steel pin;
5. 8-channel adapter (with ejector) for 200 µL tips;
6. 8-channel adapter with 35 mm stainless steel pin;
7. Stand SH-6.



8 MA-8, 8-channel adapter manifold



ORDERING INFORMATION:	Cat. number
FTA-2i, with 2l trap flask, universal adapter **MA-U** (for 200/1000 µL single use tips)	BS-040120-A02
Optional accessories:	
HAS-1, hand operator set	BS-040118-PK
MA-8, 8-channel adapter manifol	BS-040108-BK
Extended tubing 2 m long, with fittings and MA-U adapter	BS-040120-DK
Replacement parts:	
Suction microbiologic hydrophobic filter	BS-040120-S10
MA-U, universal adapter for 200/1000 µL single use tips	BS-040118-AK

FTA-1, Aspirator with Trap Flask

DESCRIPTION

Aspirator with trap flask **FTA-1** is designed for aspiration/removal of alcohol/buffer remaining quantities from microtest tube walls during DNA, RNA purification and other macromolecule reprecipitation techniques.

The device can also be used for routine operations of cells washing from culture medium and resuspension in a buffer. Aspirator operation principle is based on creating negative pressure in trapping flask using built-in microcompressor. The collecting tip is connected with polyethylene tube to the trapping flask. Liquid is removed from the microtest tube when the collecting tip touches the solution surface. A tube holder-organizer is conveniently located at **FTA-1** right-hand side; it accommodates two tubes (e.g. for hydrochloric acid solution and distillate) necessary for collecting tip washing and storing, so that a tip can be reused.

❶ Suction microbiological hydrophobic filter type 2200/02: Suction microbiologic filter eliminates the risk of contamination with bacteria, viruses and infected particle from patient to suction pump or central vacuum distribution. Suction microbiological filter is hydrophobic with very high bacterial blocking efficiencies, up to 99.99999% particles bigger than 0.027 µm (which is smaller than Hepatitis A, B and C).

Basic Plus
Product Class

Product video is available on the website

SPECIFICATIONS

Vacuum	–500 mbar
Trap flask volume	1 l
Dimensions with trap flask (W×D×H)	160 × 210 × 340 mm
Weight with trap flask	1.7 kg
Input current/power consumption	12 V, 300 mA / 3.6 W
External power supply	Input AC 100–240 V; 50/60 Hz; Output DC 12 V

Optional 8-channel adapter manifold MA-8

ORDERING INFORMATION:

	Cat. number
FTA-1 with 1l trap flask	BS-040108-AAG
Optional accessories:	
MA-8	BS-040108-BK
Replacement parts:	
Suction microbiologic hydrophobic filter	BS-040108-S25

Assist, pipette series

I LOVE PIPETTE

DESCRIPTION

The Assist series pipettes are single, 8 or 12 channel variable volume pipettes designed to measure and transfer volumes.

Single-channel pipettes are produced in ten ranges of volumes from 0.1 µl to10,000 µl depending on the model.

Multichannel pipettes are produced in four ranges of volumes: 0.5-10 µl, 5-50 µl, 20-200 µl, 50-300 µl.

The pipettes are equipped with an analogue counter which shows the pipetting volume. The volume setting is done by turning the pipetting pushbutton knob or the black adjustment knob in the right direction. The volume range is shown on the pipetting pushbutton.

Common pipettes usage depending on the volume	
AP2, AP10, AP8-10, AP12-10	Measurement and transfer of micro-volumes, DNA sequencing and enzyme-assay applications.
AP20, AP50, AP100, AP200, AP250, AP1000, AP8-50, AP12-50, AP8-200, AP12-10, AP8-300, AP12-300	Measurement and transfer of general aqueous solution, acids and bases.
AP5000, AP10000	Measurement and transfer of large volumes.

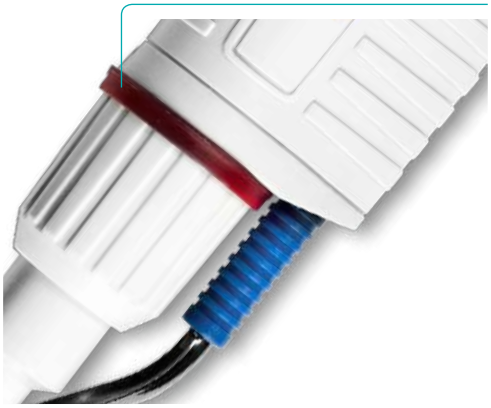
Pipette:	Volume (µl)	Colour code	Fit to tips	Cat. number
Single channel:				
AP2	0.1–2.0	🔴	10 µl	BS-010501
AP10	0.5–10.0	🔴		BS-010502
AP20	2–20	🟡	200 µl	BS-010503
AP50	5–50	🟡		BS-010504
AP100	10–100	🟡		BS-010505
AP200	20–200	🟡		BS-010506
AP250	50–250	🟢	300 µl	BS-010507
AP1000	100–1,000	🔵	1,000 µl	BS-010508
AP5000	500–5,000	○	5,000 µl	BS-010509
AP10000	1,000–10,000	○	10,000 µl	BS-010510
Multichannel:				
AP8-10 AP12-10	0.5–10	—	10 µl	BS-010511 BS-010512
AP8-50 AP12-50	5–50	—	200 µl	BS-010513 BS-010514
AP8-200 AP12-200	20–200	—		BS-010515 BS-010516
AP8-300 AP12-300	50–300	—	300 µl	BS-010517 BS-010518
Sets:				
AP10, AP20, AP200, AP1000, 4 position stand, demo tips				BS-010519
AP10, AP100, AP1000, AP5000, 4 position stand, demo tips				BS-010520

Assist, pipette series

Features:

- Contoured shape of the handle and light weight;
- Proven accuracy and precision;
- UV resistant & fully autoclavable;
- 5 & 10 ml shaft protected by filter;
- Available in 8 and 12-channel version;
- Colour coded for easy volume identification;
- The adjustable ejector height system – to accommodate virtually all brands of tips;
- Dual volume setting using the pushbutton or the thumbwheel;
- Soft spring system for smooth, effortless pipetting.

Colour coded for easy volume identification



Pipette stands:	Cat. number
❶ Carousel stand (rotating) for 6 pipettes	BS-010522
❷ Multiple stand (fixed) for 8 pipettes	BS-010523
❸ 1-position stand	BS-010524
❹ 4-position stand	BS-010525

❶

❷

❸

❹

Pipette tips:	Cat. number
❶ Pipette tips available in bulks – resealable plastic bags – keeping them safe from contamination. One bulk contains 200, 250 or 1,000 pieces of tips depending on the tip volume.	On request
❷ Tips racked in durable polypropylene box providing good stability on the lab bench. One rack contains 96 or 100 pieces of tips depending on the tip volume.	On request
❸ Stack racks secure the tips and save valuable space. One stack rack contains five trays with 96 tips. Available only for 10 µl and 200 µl tips. Can be used to refill standard racks.	On request

❶

❷

❸

Assistboy, pipette controller

Charging stand

DESCRIPTION

Assistboy pipette controller is a device intended for pipetting liquids with the use of measuring pipettes. It can work with all types of glass or plastic serological pipettes in the volume range from 0.5 ml to 100 ml.

Controller is equipped with an exchangeable filter membrane which protects shaft mechanism from aggressive liquid fumes.

Two dispense modes permit selection of dispensing intensity depending on the user's needs. The selected setting of the pipette controller mode is shown on display.

Safe and efficient work

- Protected by a PTFE filter blocking any liquid from entering the unit
- Autoclavable filter, the pipette holder and the nosepiece
- UV resistant body for safe sterilization
- Powerful, environmentally friendly 3 Ni-MH batteries enable many hours of continuous work
- LCD display showing battery charge level

Speed and working mode adjustment

- Function buttons for SPEED and working MODE control in a reach of a thumb
- Additional speed adjustment by the pressure applied to the trigger buttons

Working comfort

- Suitable for glass & plastic volumetric pipettes 0.5–100 ml
- Ergonomically shaped handle
- Well located function buttons
- Convenient charging stand

ORDERING INFORMATION:	Cat. number
Assistboy with charging stand	BS-010521

BIOPROCESSING:

CO_2 INCUBATOR, SHAKER-INCUBATORS, PERSONAL BIOREACTORS

S-Bt Smart Biotherm

Compact CO_2 Incubator

ES-20/80

Shaker-Incubator

RTS-1 and RTS-1C

Personal Bioreactors

Catalogue 2021

S-Bt Smart Biotherm, Compact CO_2 Incubator NEW

DESCRIPTION

S-Bt Smart Biotherm is designed for work in the areas of cell biology (operations with animal cell cultures and tissues), molecular biology (DNA/RNA reaction analysis, hybridization reactions), biotechnology (synthesis of target proteins and other molecules), immunology (synthesis of antibodies and other proteins of the immune system). Unit provides six-sided heating: the heating elements are located on the walls and on the door, thus providing excellent uniform temperature distribution, regardless of external factors, such as ambient temperature and positioning of the device.

Built-in infrared CO_2-sensor allows accurate control of the CO_2 level. The sensor makes measurement non-sensitive to changes in temperature and humidity inside the incubator.

The chamber is made of stainless steel with smoothed seams to minimize contamination and to facilitate cleaning.

S-Bt is equipped with a UV air recirculation system — 1 UV lamp and a fan are mounted behind the rear wall, providing decontamination of the working volume.

A convenient access port is built in the wall of the incubator for easy output of wire sensors or devices' installed inside. The access port is heated independently to prevent the formation of condensate.

Unit is equipped with error tracing and alarm systems, which significantly lower potential risks during operation.

Unit is equipped with a "black box" system that records temperature, humidity and CO_2 levels, as well as statuses for door opening, UV lamp, fan and errors, to the internal memory.

Bluetooth® connection to PC is available.

Smart Plus
Product Class

Bluetooth® connection

Product video is available on the website

SPECIFICATIONS

Chamber Material	Stainless steel (1 mm)
Temperature setting range	+25°C ... +60°C
Temperature stability	±0.1°C
Temperature uniformity @37°C	±0.3°C
Timer sound signal	yes
Working volume	46 l
Number of shelves	3 (max 6)
Inner door	Glass
Relative humidity	>90% @ 37°C
Humidity delivery	Water bath
CO_2 control range*	0–20%
CO_2 sensor	Infrared sensor
Temperature and CO_2 level input	Digital
UV lamp	1 × 6 W, TUV G6T5
Data transfer	Wireless
Access port	1 (Ø 26 mm)
Working voltage	230V, 50/60 Hz; 115 V, 50/60 Hz
Power consumption	600 W
Weight	37.7 kg
Dimensions (W×D×H)	500 × 560 × 550 mm
Inner chamber dimensions (W×D×H)	350 × 330 × 390 mm

* — At set temperature from ambient to 50 °C

APPLICATION AREAS

- **Cell biology:** operations with animal cell cultures and tissues;
- **Molecular biology:** DNA/RNA reaction analysis, hybridization reactions;
- **Biotechnology:** synthesis of target proteins and other molecules;
- **Immunology:** synthesis of antibodies and other proteins of immune system.

FEATURES

- Six-sided heating provides uniform distribution of the temperature inside the chamber;
- Infrared CO_2 sensor, non-sensitive to temperature and humidity changes;
- UV recirculation system for decontamination cycles;
- Bluetooth data transfer to PC;
- «Black box» parameter logging system;
- Error tracing and alarm system;
- Separately heated lockable port for chamber access for cables.

S-Bt Smart Biotherm, Compact CO_2 Incubator

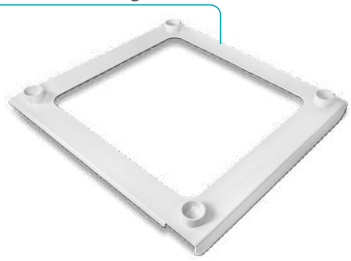
Simple CO_2 tank connection

Air UV recirculation system in the chamber

Gas purification filter

PC software

Incubator stacking device



ORDERING INFORMATION	Cat. number
S-Bt Smart Biotherm, PC software included + **RS6**, rack with 3 shelves	BS-010425-A01
S-Bt Smart Biotherm, PC software included + **RS2**, rack for CPS-20 installation	BS-010425-A10
Optional accessories:	
CPS-20, CO_2 Shaker	BS-010172-A01
Shelf	BS-010425-AK
USB Bluetooth® adapter	BS-010425-FK
Incubator stacking device	BS-010425-CK

CPS-20, CO_2 Shaker NEW

DESCRIPTION

CO_2 Shaker **CPS-20** provides regulated orbital motion of the platform and is designed for use in Biosan's S-Bt CO_2 Incubator. **CPS-20** is specifically designed for unnecessary harsh environments such as CO_2 and humidity and provides reproducible results for cell culture growth. A choice of five interchangeable platforms provides the possibility of performing various procedures and techniques in various cultivation vessels.

CPS-20 incorporates a brushless motor with a guaranteed service life of up to 35,000 hours. The unit is equipped with a triple eccentric mechanism for platform motion that provides supreme balancing characteristics, superior reliability and quiet operation. The specially designed remote controller allows for the protection of electronics from a CO_2 incubator environment, as well as, the remote control minimizes interference with the incubator environment and the ongoing experiment.

SPECIFICATIONS

Speed control range	50–250 rpm (increment 10 rpm) max. speed depends on the load and vessels' shape
Digital time setting	1 min–96 h/non-stop (increment 1 min)
Digital speed control	+
Maximum continuous operation time	168 h
Orbit	20 mm
Maximum load	3 kg
Overall dimensions (W×D×H)	255 × 255 × 100 mm
Weight	3.4 kg
Input current/power consumption	470 mA / 5.7 W
External power supply	Input AC 100–240 V; 50/60 Hz Output DC 12 V

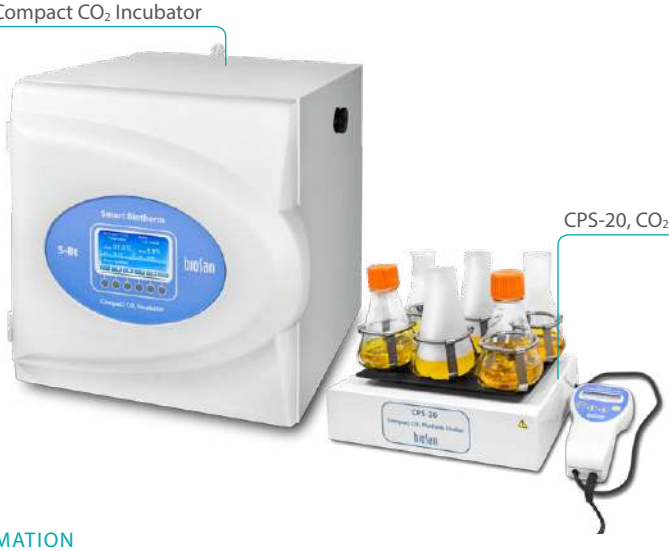
RS2, rack for CPS-20 installation

Platforms for CPS-20

Platform	Description	Dimensions (mm)	Working Area (mm)	Cat. number
UP-12	Universal platform with adjustable bars for different types of flasks, bottles and beakers with silicone mat	285 × 220 × 40	270 × 185 × 40	BS-010108-AK
Bio PP-4	Flat platform with silicone mat for Petri dishes, culture flasks, agglutination cards	255 × 255	230 × 230	BS-010116-AK
P-12/100	Platform with clamps for flasks, 100–150 ml (12 places)	250 × 190	250 × 190	BS-010108-EK
P-6/250	Platform with clamps for flasks, 250–300 ml (6 places)	250 × 190	250 × 190	BS-010108-DK
P-16/88	Platform with spring holders for up to 88 tubes up to 30 mm diameter (e. g. 10 ml, 15 ml, 50 ml tubes)	275 × 205 × 75	275 × 205 × 75	BS-010116-BK

S-Bt Smart Biotherm, Compact CO_2 Incubator

CPS-20, CO_2 Shaker



ORDERING INFORMATION	Cat. number
CPS-20, CO_2 Shaker	BS-010172-A01
RS2, rack for CPS-20 installation	BS-010425-HK

RTS-1 and RTS-1C, Personal bioreactors

Smart Plus
Product Class

USB connection

Product video is available on the website

Reverse–Spin®
Innovative Mixing Technology

Users articles: biosan.lv/report

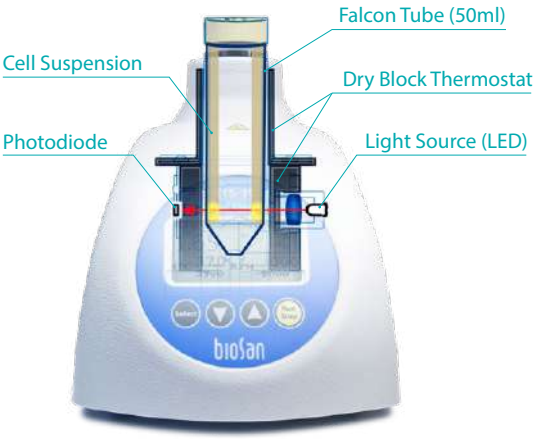
SPECIFICATIONS

	RTS-1	RTS-1C
Theoretically possible measurement range in OD_{850}, at 10 ml working volume*: Rod shaped bacteria (e.g. *E.coli*) Yeast (e.g. *P. pastoris*)	 0–25 (0–45.6 OD_{600} equivalent**) 0–50 (0–75 OD_{600} equivalent)	
E.coli BL21 Factory calibration measurement range, in OD_{850}: at 10–20 ml volume at 20–30 ml volume	 0–10 OD (0–19 OD_{600} equivalent) 0–8 OD (0–15.2 OD_{600} equivalent)	
Factory calibration measurement precision	±0.3 OD_{850}	
Mass transfer coefficient k_La (h^{-1})	Up to 350 ±26 h^{-1} at 5 ml	
Measurement Wavelength (λ)	850 ±15 nm	
Light source	LED	
Real time measurement	1–60 min	
Temperature setting range	+25°C ... +70°C (increment 0.1°C)	+4°C ... +70°C (increment 0.1°C)
Bottom control range point	5°C above ambient	15°C below ambient
Top control range point	70°C	
Stability	±0.°C	
Sample temperature accuracy: 20–45°C <20°C >45°C	 ±1 ±2 ±3	
Sample temperature heating/cooling rate	0.7°C/min	
Sample volume	5–30 ml	
Speed control range	50–2,000 rpm (increment 10 rpm)	
Speed control precision	±15 rpm	
Reverse-Spin Time	1–60 s (increment 1 s)	
Display	LCD	
Minimum PC requirements	Intel/AMD Processor, 1 GB RAM, Windows Vista/7/8/8.1/10, 2.0 USB port	
Optimal PC requirements	Intel/AMD Processor, 3 GB RAM, Windows 7/8/8.1/10, 2.0 USB port	
Overall dimensions (W×D×H)	130 × 212 × 200 mm	
Weight	1.7 kg	2.2 kg
Input current/power consumption	12 V DC, 3.3 A/40 W	12 V DC, 5 A/60 W
External power supply	Input AC 100–240 V 50/60 Hz; Output DC 12 V	

* — Highest k_La (h^{-1}) is achieved at 5 ml working volume which is optimal for aerobic cultivation
** — Conversion coefficients from OD_{850} to OD_{600} vary between strains and phases of growth

See the Reverse-Spin® Technology — Innovative Principle of Microbial Cultivation on web page biosan.lv/rts-tech

RTS-1 and RTS-1C, Personal bioreactors



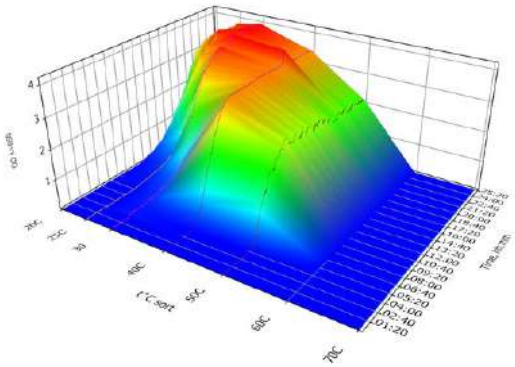


Figure 1. 3D graph of *E.coli BL21* growth kinetics showing the effect of different temperatures in 7 parallel RTS bioreactors.

RTS-1 and **RTS-1C** are personal bioreactors that utilize patented Reverse-Spin® technology that applies non-invasive, mechanically driven, low energy consumption, innovative type of agitation where cell suspension is mixed by the single-use falcon bioreactor tube rotation around its axis with a change of direction of rotation motion resulting in highly efficient mixing and oxygenation for aerobic cultivation. Combined with a near-infrared optical system, it is possible to register cell growth kinetics non-invasively in real-time.

FEATURES

- Reverse-Spin® mixing principle in 50 ml falcon tubes allows to achieve high k_La (h^{-1}) up to 450, which is essential for efficient aerobic cultivation;
- Individually controlled bioreactor accelerates optimization process;
- Possibility to cultivate microaerophilic and obligate anaerobic microorganisms (not strict anaerobic conditions);
- Reverse-Spin® mixing principle enables non-invasive biomass measurement in real-time ;
- Near-infrared optical system makes it possible to register cell growth kinetics;
- Free of charge software for storage, demonstration and analysis of data in real-time;
- Compact design with a low profile and small footprint for personal application;
- Temperature control for bioprocess applications;
- Active cooling for rapid temperature control, e.g. for temperature fluctuation experiments;
- Task profiling for process automatization;
- Cloud data storage possibility to remotely monitor the process of cultivation while at home or using a mobile phone.

TYPICAL APPLICATIONS

- Fermentation real-time growth kinetics
- Clone candidate screening
- Protein expression
- Temperature stress and fluctuation experiments
- Media screening and optimization
- Growth characterization
- Inhibition and toxicity tests
- Strain quality control

SOFTWARE FEATURES

- Real-Time cell growth logging;
- 3D graphical representation of OD or growth rate over time over unit;
- Pause option;
- Save/Load option;
- Report option: PDF and Excel;
- Connect up to 12 units (recommended) simultaneously to 1 computer;
- Remote monitoring option (requires internet connection);
- Cycling/Profiling options;
- User manual calibration possibility for most cells.

ORDERING INFORMATION

	Cat. number
RTS-1C including TubeSpin® Bioreactor 50, TPP®, 20 pcs.	BS-010160-A04
RTS-1 including TubeSpin® Bioreactor 50, TPP®, 20 pcs.	BS-010158-A04
Optional accessories:	
TubeSpin® Bioreactor 50, TPP®, 20 pcs.	BS-010158-AK
TubeSpin® Bioreactor 50, TPP®, 180 pcs.	BS-010158-CK
USB 2.0 Hub 10 × ports	BS-010158-BK

RTS-1 and RTS-1C, Personal bioreactors

Recommendations for creating personal settings for cultivation of microorganisms. Points that should be considered:

1. The growth rate directly depends on the tube's rotation speed, since it is directly proportional (in the range from 1,500 to 2,500 rpm) with the rate of saturation of the medium with oxygen.
2. Naturally, with aerobic metabolism, the change in OD over time will also proportionally increase depending on same as above.
3. This will also affect the specific growth rate ΔOD/Δt.
4. As well as the time for the growth curve to reach the stationary growth phase during aerobic fermentation (the higher the tube rotation speed, the faster the culture's exit to the stationary phase)
5. The saturation of the medium with oxygen will depend on the frequency of switching the tube rotation to the opposite (RST) (the more often the direction of rotation of the tube is reversed, the higher the oxygen mass transfer)
6. OD λ=850 — this wavelength is used to measure microorganism cell concentration because nutrient media and microorganism cells have colour. This must be taken into account when monitoring the specific dynamics of microorganism growth. In order to go into the "shadow" region (independent of the colour of the medium and microorganism), we offer the near infrared (not visible to the human eye) light scattering measurement range of — 850 nm. Since we are still in the sensitive range and, at the same time, are independent of the natural colouration of microorganism colonies. The conversion factor OD_{850}/OD_{600} is about 2.

It is known that the aerobic bacterial growth is influenced by efficient gas exchange. Figure 2 a-c, serves as an example of growth optimization and illustrates the relationship between RST and gas exchange. As RST decreased the specific growth rate, and biomass yield increased, the highest aeration and optimal growth conditions for *E.coli BL21* optimized at 2000 RPM 1 s RST.

Cell growth depending on rotation intensity

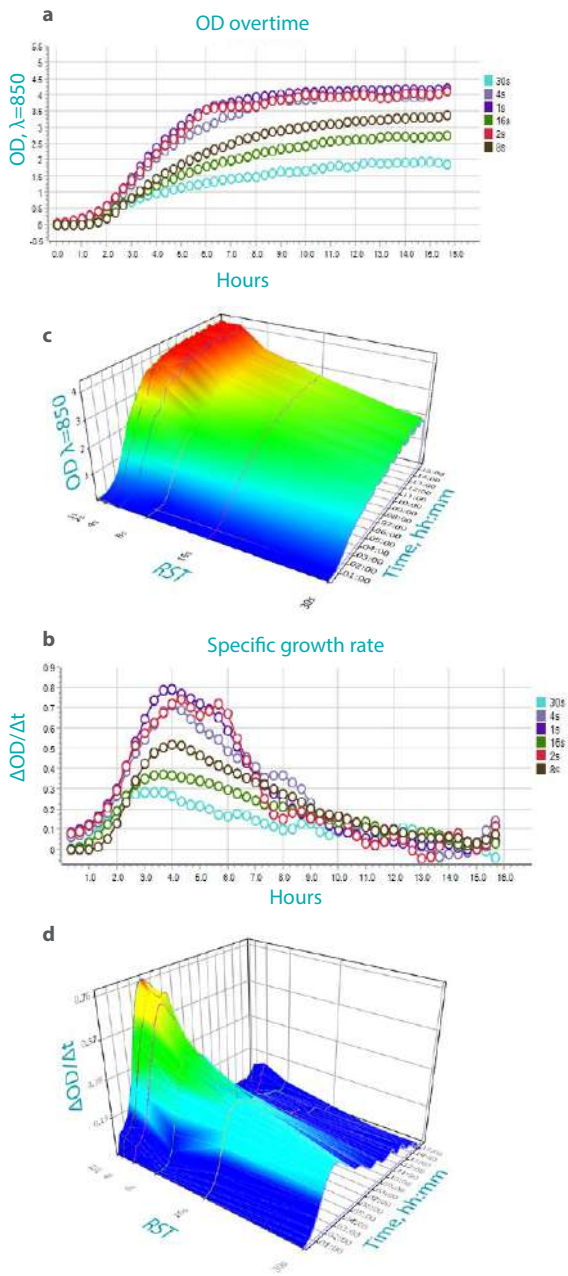


Figure 2, a-c. Influence of Reverse Spin Time (RST) on growth kinetics of *E.coli BL21* in OD_{600}. (a-c) Biomass growth; (b-d) Specific growth rate; throughout cultures were grown in 50 ml TPP Bioreactor tubes, 30% filling volume, 2,000 RPM, RST 1, 2, 4, 8, 16, 30 seconds, LB medium and 37°C temperature, to convert OD_{850} to OD_{600} simply multiply OD_{850} by 1.9.

RTS-1 and RTS-1C, Personal bioreactors

k_La (h^{-1}) results in RTS-1/C

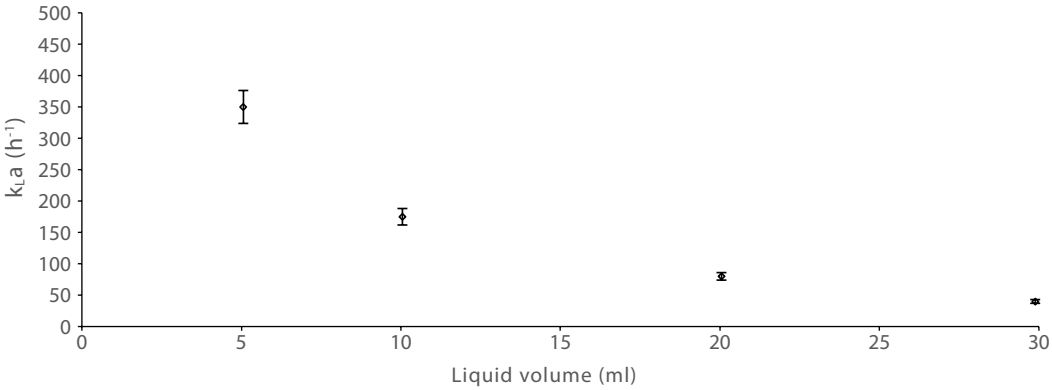


Figure 3. Determination of k_La in 50 ml TPP Bioreactor tubes. The bioreactor vessels were filled with 5, 10, 20, 30 ml deionized water, and measurements were made by non-invasive O_2 sensors and optics (PreSens, Regensburg, Germany) at 37°C using the gassing-out method. Mean and standard deviation of at least five independent experiments are shown.

The k_La was measured in 5, 10, 20, 30 ml of deionized water in 50 ml TPP Bioreactor tubes at agitation rate of 2,000 rpm and 1 s RST, this agitation rate was found optimal for Reverse-Spin® mixing principle during initial optimization studies. Over the working volume range, the k_La increased with the decrease of liquid volume (Figure 3). At the smallest working volume of 5 ml, the highest k_La of 350 ±26 h^{-1} was reached.

Cells successfully cultivated

Saccharomyces cerevisiae, Pichia pastoris, Yarrowia lipolytica, Bacillus subtilis, Escherichia coli, Lactobacillus acidophilus, Bifidobacterium bifidum, Pseudomonas aeruginosa, Hybridoma, Jurkat and CHO cells.

Types of recommended tubes

For aerobic microorganisms, it is recommended to use tubes that are supplied by TPP — TubeSpin® Bioreactor 50ml. For obtaining optimal results growing aerotolerant anaerobes, it is required to seal the screw cap of TPP TubeSpin® Bioreactor 50ml by tape or purchase TPP TubeSpin® 50 ml falcon tubes without the membrane filter. It is also possible to use other manufacturer tubes of the same type, e.g. Corning® 50 ml Mini Bioreactor, but the device rotor must be modified. It is possible to request this specific modification.

Factory calibration particle size and calibration coefficients 600nm/850nm

Factory calibration of the instrument is designed for rod-shaped bacteria size of *E.coli BL21*. In case of exceeding this size, the measurement system will not work correctly. Optical density OD_{850} to OD_{600} conversion coefficient of the factory calibration is equal to 1.9.

Factory calibration growth phase influence on measurement accuracy

During the growth transition of Escherichia coli culture from exponential growth to the stationary phase, many morphological and physiological changes occur, including cell volume decrease and cell shape change. Therefore, if cells were taken for referent measurement using a spectrophotometer at different stages from the stationary phase, then the correctness of measurement will be worse than specified.

Conversion rate coefficient of user calibration

Optical density OD_{850} to OD_{600} nm conversion rate coefficient depends on the cell size and volume. Therefore, the coefficient will be different for other cell sizes. The device can be calibrated at desired reference wavelength to meet user's needs, e.g. OD_{600}.

Do you want to test this system?

We can provide demo units for 50% of the price for testing or creating an application note. For such, inquiries please contact our R&D department directly at igor@biosan.lv.

RTS-8 and RTS-8 Plus, Multi-channel Bioreactors NEW

DESCRIPTION

RTS-8 and **RTS-8 plus** are multi-channel bioreactors that utilise patented Reverse-Spin® technology that applies non-invasive, mechanically driven, low energy consumption, innovative type of agitation where cell suspension is mixed by the single-use falcon bioreactor tube rotation around its axis with a change of direction of rotation motion resulting in highly efficient mixing and oxygenation for aerobic cultivation.

Combined with a near-infrared measurement system, it is possible to register cell growth kinetics and additionally on **RTS-8 plus** fluorescence and luminescence measurement systems used to register pH and O_2 non-invasively in real-time. For pH and O_2, innovative single-use sensor spots are used inside the tubes. Although O_2 supply is one of the major issues in the cultivation of aerobic organisms, especially in oxygen-limited conditions, adequate methods for real monitoring of dissolved oxygen were missing, and sufficient O_2 supply was usually assumed. Innovative non-invasive oxygen sensors integrated into falcon tubes now enable online oxygen monitoring and give new insights into metabolic activities.

The pH is one of the major issues in the cultivation of cells, yeast or bacteria. Cultivation vessels, that are sensor-limited, are widely applied in academic and industrial bioprocess development. As adequate methods for real monitoring of pH were not available, cumbersome at-line sampling was used, lacking high data density and interfering with growth. Non-invasive real-time pH measurement provides new insights into metabolic activity and changes in metabolic pathways.

SOFTWARE FEATURES

- Real-Time cell growth logging;
- 3D graphical representation of OD or growth rate over time over unit;
- Pause option;
- Save/Load option;
- Report option: PDF and Excel;
- Remote monitoring option (requires internet connection);
- Cycling/Profiling options;
- User manual calibration possibility for most cells.

only RTS-8 Plus

- Real-Time pH and O_2 measurement and logging

Tube for RTS-8 Plus with sensor

Smart Plus
Product Class

Reverse-Spin®
Innovative Mixing Technology

FEATURES

- Parallel cultivation of 8 tube bioreactors enables to save time and resources for bioprocess optimization;
- Individually controlled bioreactor accelerates optimization process;
- Possibility to cultivate microaerophilic and obligate anaerobic microorganisms (not strict anaerobic conditions);
- Reverse-Spin® mixing principle enables non-invasive biomass measurement in real time;
- Near-infrared optical system makes it possible to register cell growth kinetics;
- Free of charge software for storage, demonstration and analysis of data in real time;
- Compact design with low profile and small footprint for personal application;
- Individual temperature control for bioprocess applications;
- Active cooling for rapid temperature control, e.g. for temperature fluctuation experiments;
- Task profiling for process automatization;
- Cloud data storage to remotely monitor the process of cultivation while at home or using a mobile phone.

only RTS-8 Plus

- Non-invasive O_2 and pH measurement allows for accurate monitoring of metabolic activitiesf cultivation while at home or using a mobile phone

Advantages of the sensor spots:

- They are small;
- Their signal does not depend on the flow rate of the sample;
- They can be physically divided from the measuring system which allows a non-invasive measurement;
- They can be used in disposables;
- Therefore, they are ideally suited for the examination of small sample volumes, highly parallelized measurements in disposables,and biotechnological applications.

NEW RTS-8 and RTS-8 Plus, Multi-channel Bioreactors

USB connection

Product video is available on the website

TYPICAL APPLICATIONS

- Fermentation real time growth kinetics;
- Clone candidate screening;
- Protein expression;
- Temperature stress and fluctuation experiments;
- Media screening and optimization;
- Growth characterization;
- Inhibition and toxicity tests;
- Strain quality control;
- Initial bioprocess optimization studies.

SPECIFICATIONS

	RTS-8	RTS-8 Plus
Light source	Laser	
Measurement wavelength (λ)	850 ±15 nm	
Measurement range	0–100 OD_{600}	
E. coli factory calibration measurement range	0–50 OD_{600}	
P. pastoris factory calibration measurement range	0–100 OD_{600}	
Achievable user calibration measurement error (range 0.1–3 OD_{600})	±0.3	
Achievable user calibration measurement error (range 3–100 OD_{600})	≤15%	
Measurement periodicity per hour	1–60 (increment 1 min)	
Temperature setting range	+15°C ... +60°C	
Temperature control range	+15°C below ambient ... +60°C (increment 0.1°C)	
Temperature stability	±0.2°C	
Sample temperature accuracy (20–37°C)	±1°C	
Tube sockets	8	
Sample working volume range	3–50 ml	
Speed control range	150–2,700 rpm (increment 1 rpm)	
Display	LCD	
Dimensions (W×D×H)	350 × 690 × 300 mm	
Weight	20 kg	
Nominal operating voltage	AC 230 V, 50 Hz	
Power consumption	3.15 A / 500 W	
O_2 sensor*	—	+
pH sensor**	—	+

*O_2 sensor

Range	0–100%
Accuracy	±0.05% O_2 at 0.2%, ±0.4% O_2 at 20.9%
Drift	<0.03% O_2 within 30 days
Temperature range	up to 40°C
Response time (t90)	<6 s
Storage stability	18 months

**pH sensor

Range	4.0–8.5 pH
Accuracy	±0.10 pH at pH 7
Drift	<0.005 pH per day
Temperature range	up to 40°C
Response time (t90)	<120 s
Storage stability	18 months

ORDERING INFORMATION

	Cat. number
RTS-8 including TPP TubeSpin® Bioreactor vessels 50ml, 20pcs.	BS-010168-A01
RTS-8 Plus including TPP TubeSpin® Bioreactor vessels 50ml, 20pcs and sterile TPP TubeSpin® Bioreactor vessels, 50ml, with pH and O_2 sensors, 10pcs	BS-010170-A01

Optional accessories:

TubeSpin® Bioreactor 50, TPP®, 20 pcs.	BS-010158-AK
TubeSpin® Bioreactor 50, TPP®, 180 pcs.	BS-010158-CK
USB 2.0 Hub 10 × ports	BS-010158-BK
Sterile TPP TubeSpin® Bioreactor vessels, 50 ml, with pH and O_2 sensors	200001368

ES-20/60, Orbital Shaker–Incubator

DESCRIPTION

Orbital Shaker-Incubator **ES-20/60** for biotechnological and pharmaceutical laboratories is a professional category equipment designed to cultivate microorganisms and eukaryotic cells, including animal, plant and insect cells. It is also possible to cultivate thermophilic bacteria in **ES-20/60** shaker-incubator.

Shaker is equipped with a direct-drive mechanism for platform motion. It provides a reliable and stable operation for the long term experiments needed for cell growth.

Shaker–Incubator **ES-20/60** provides smooth or intensive mixing in flasks installed on the platform.

Built-in noiseless thermoresistant brushless fan provides precise temperature distribution inside the chamber (adjustable for up to +80°C). The inner chamber is made of stainless steel. State-of-the-art motor, newest thermal insulation materials, soft-start of the platform motion and temperature **PID–control** decrease the energy consumption and make the Shaker-Incubator highly energy efficient despite its relatively large size.

Premium
Product Class

Ø 20 mm orbit

Heat up time for **ES-20/60**

from 25°C — 90 min — to 80°C

ES-20/80, Orbital Shaker–Incubator NEW

DESCRIPTION

ES-20/80 shaker-incubator for biotechnological and pharmaceutical laboratories is a professional category equipment. The typical applications include microbial and cell culture cultivation, protein expression, solubility studies, general mixing, as well as other various applications in the fields of biology and chemistry. he unit is equipped with a newly developed triple eccentric mechanism for platform motion that provides supreme balancing characteristics, superior reliability and quiet operation. The achieved stability of the unit during vigorous mixing allows for stacking installation of up to 3 units which enables to save space. The new display and easy to use user interface provide a clear and intuitive control of parameters and also allow data logging, storage and display over time. Additional features like out-of-balance sensor and automatic thermostat failure detection make this shaker-incubator an advanced and safe product. Bluetooth connectivity to PC allows for data management, data logging, parameter control and profiling in the included software.

A built-in heat-resistant brushless fan provides precise temperature distribution inside the chamber (from 5°C above ambient up to +80°C). Additionally, excellent sample temperature uniformity of ±0.3°C at 37°C is achieved. The inner chamber is made of stainless steel. State-of-the-art motor, thermal insulation materials and parameter PID-control decrease the energy consumption and make the shaker-incubator highly energy efficient despite its relatively large size.

Smart Plus
Product Class

Ø 20 mm orbit

Bluetooth® connection

50-400 rpm

Heat up time for **ES-20/80**

from 25°C — 75 min — to 80°C

ES-20/60 and ES-20/80, Orbital Shakers-Incubators

SPECIFICATIONS

	ES-20/60	ES-20/80
Temperature setting range	+25°C... +80°C	
Speed control range	50–250 rpm	50–400 rpm
Temperature control range	10°C above ambient ... +80°C	5°C above ambient ... +80°C
Setting resolution	0.1°C; 10 rpm	0.1°C; 10 rpm
Temperature stability	±0.5°C	±0.1°C at 37°C
Temperature accuracy	±0.5°C	±0.1°C at 37°C
Temperature uniformity	±0.5°C	±0.3°C at 37°C
Orbit	20 mm	
Display	LCD, 2×16 signs	TFT, 5 inches
Digital time setting	1 min–96 h/non-stop (1 min increment)	
Timer sound signal	yes	
Maximum load	8 kg	10.6 kg
Data transfer	—	Bluetooth®
Stacking	—	up to 3*
Overall dimensions (W×D×H)	590 × 525 × 510 mm	620 × 530 × 510 mm
Dimensions of the inner chamber	460 × 400 × 310 mm	
Weight	41.1 kg	48 kg
Nominal operating voltage	230 V, 50/60 Hz or 120 V, 50/60 Hz	230 V, 50/60 Hz
Power consumption	450 W (2 A)/450 W (4.5 A)	500 W (2.2 A)
Software	—	yes

* Additional stacking kit required

ORDERING INFORMATION

	Cat. number
ES-20/60 without platform	BS-010135-AAA
ES-20/80 with software, without platform	BS-010167-A05
Optional accessories:	
USB Bluetooth® adapter	BS-010425-FK
Stacking kit for 2× **ES-20/80**	BS-010167-OK
Stacking kit for 3× **ES-20/80**	BS-010167-PK

Platforms cat. numbers for **ES-20/60** can be found on page 23

Platforms cat. numbers for **ES-20/80** can be found on page 126

Description of all platforms for ES-20/60 on page 23

Description of all platforms for ES-20/80 on page 126

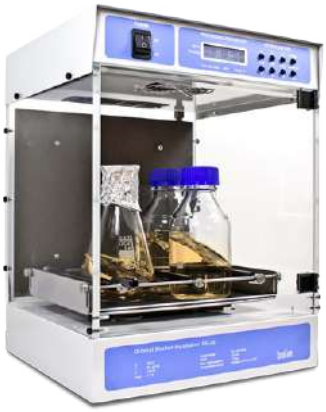
Platforms for **ES-20/80**

Platform		Description	Dimensions (Working Area)	Cat. number
HSP-30/100		Platform with 30 tight fit clamps for 100–150 ml flasks	360 × 400 mm (360×400 mm)	BS-010167-KK
HSP-16/250		Platform with 16 tight fit clamps for 250–300 ml flasks	360×400 mm (360×400 mm)	BS-010167-MK
HSP-9/500		Platform with 9 tight fit clamps for 500 ml flasks	360×400 mm (360 × 400 mm)	BS-010167-NK
HSP-6/1000		Platform with 6 tight fit clamps for 1,000 ml flasks	360×400 mm (360×400 mm)	BS-010167-LK
PP-400		Flat platform with non-slip silicone mat	360×400 mm (360 × 400 mm)	BS-010135-FK
UP-168		Tight fit clamp for 50, 100, 250, 500, 1,000 ml flask (for UP-168)	360 × 400 mm (360 × 400 mm)	BS-010135-JK
HSC-50 **HSC-100** **HSC-250** **HSC-500** **HSC-1000**		Tight fit clamp for 50, 100, 250, 500, 1,000 ml flask (for UP-168)	Ø 50 mm Ø 65 mm Ø 85 mm Ø 105 mm Ø 130 mm	BS-010167-DK BS-010167-EK BS-010167-FK BS-010167-JK BS-010167-IK
NEW **SPML**		Set of 3 double-sided adhesive strips as an alternative for regular flask clamps (for UP-168)	390 × 80 × 3 mm (2 per platform)	BS-010135-MK
TR-21/50		Test tube rack for 50 ml with 21 drillings (for UP-168)	340 × 124 mm (2 per platform)	BS-010135-KK
TR-44/15		Test tube rack for 15 ml with 44 drillings (for UP-168)	340 × 124 mm (2 per platform)	BS-010135-LK

ES-20, Orbital Shaker–Incubator

Basic Plus
Product Class

Ø 10 mm orbit



Product video is available on the website

Heat up time for **ES-20:**

from 25°C — 16 min — to 42°C

DESCRIPTION

The **ES-20** is a compact bench-top Shaker-Incubator used for mixing of biological liquids and incubation and cultivation of biological liquids according to the operator set program.

Built–in microprocessor thermocontroller provides constant temperature control in the incubator chamber. Forced heated air circulation inside the transparent plexiglass chamber guarantees even temperature distribution. Dismountable construction makes transportation easy.

Orbital shaking is controlled by the digital tachometer (rpm) and Digital time setting regardless of the temperature. The unit is equipped with a direct-drive system, ensuring the most reliable, stable long–time operation (up to 30 day nights).

The **ES-20** is extremely easy to operate, with a very straight-forward setup of temperature, speed and time, using the two-line set-up and status display, which clearly indicates both set and actual values for each of the three parameters.

DIFFERENT INTERCHANGEABLE PLATFORMS ALLOW USING **ES-20** FOR:

- Growing cell cultures in flasks and other laboratory glassware
- Extracting tissue samples at physiological temperatures
- Other sample preparation processes

SPECIFICATIONS

Temperature setting range	+25°C ... +42°C
Speed control range	50–250 rpm
Temperature control range	5°C above ambient ... +42°C
Setting resolution	0.1°C; 10 rpm
Temperature stability	±0.5°C
Temperature accuracy	±0.5°C
Temperature uniformity	±0.5°C
Orbit	10 mm
Display	LCD, 2 × 16 signs
Digital time setting	1 min–96 h/non-stop (1 min increment)
Timer sound signal	yes
Plexiglas walls thickness	7 mm
Maximum load	2.5 kg
Overall dimensions (W×D×H)	340 × 340 × 435 mm
Dimensions of the inner chamber	305 × 260 × 250 mm
Weight	13.2 kg
Nominal operating voltage	230 V, 50/60 Hz or 120 V, 50/60 Hz
Power consumption (230/120 V)	160 W (0.7 A)/ 170 W (1.6 A)

ORDERING INFORMATION:

	Cat. number
ES-20 without platform	BS-010111-AAA
Optional accessories:	
Platforms: **UP-12**	BS-010108-AK
PP-4	BS-010108-BK
P-12/100	BS-010108-EK
P-6/250	BS-010108-DK
P-16/88	BS-010116-BK

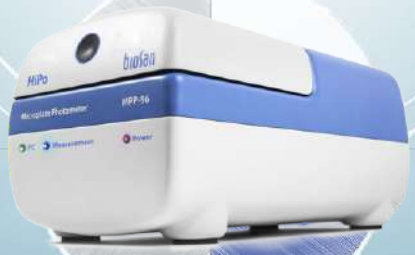
Description of all platforms for ES-20 on page 22

LAB DIAGNOSTICS:

DNA/RNA PURIFICATION, IMMUNODIAGNOSTICS

3D-IW8
Inteliwasher

PST-60HL
Plate Shaker-Thermostat



HiPo MPP-96
Microplate Photometer

Catalogue 2021

Automatic DNA/RNA extraction

Liquid Handling

Assist Series Pipettes

Incubation

TS-100

TS-100C

Sample resuspendation and droplet spin down

FVL-2400N

Automatic extraction

BioMagPure 12 Plus and reagents

Manual DNA/RNA extraction using magnetic beads technology

Sample resuspendation and droplet spin down

FVL-2400N

Sample preparation in UV–Cabinet for PCR

UVC/T-M-AR, or similar, see UV–Cabinets for PCR

Mixing and resuspendation

MPS-1

V-1 plus

Multi Bio RS-24

Capture of magnetic beads

MagSorb-16

Centrifugation

Microspin 12

Vacuum aspiration

FTA-1

FTA-2i

Incubation

TDB-120

TS-100C

Reagents

Reagents for extraction*

* — Information about current offers on the products of other manufacturers are available in the corresponding sections of our site www.biosan.lv/en/products

BioMagPure 12 Plus, Compact Bench-Top Robotic Workstation For Automated Nucleic Acid Purification

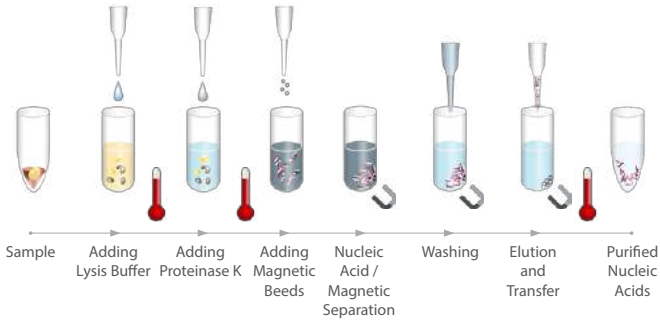
DESCRIPTION

The **BioMagPure 12 Plus** consists of a compact bench-top robotic workstation for automated nucleic acid purification. Usage of pre-filled reagent cartridges and disposable consumables enable a true walk-away automation and high-quality nucleic acid extraction solution. Proven magnetic separation technology makes purification efficient, easy to use, reliable, safe and cost-effective.

BioMagPure 12 Plus has an ingeniously designed polygonal reaction chamber with patented parts that ensure high efficiencies of lysis and elution through a large contact area of magnet and heating element allowing maximisation of magnetic bead recovery, minimisation of the residues of magnetic beads and alcohols in the final elute product. Specific formation of reaction chamber ensures unrivalled mixing ability and exclude conventional mixing by tip or pipetting thus eliminates cross-contamination possibility.

Reagent kit contains everything for extraction procedure performance, including all necessary plastics, pre-filled reagent cartridges, incubation buffers and solutions for sample pre-treatment (if needed),

With the flexibility of processing 1–12 samples per run, the **BioMagPure 12 Plus** is tailor-made to fit small clinics and early-stage laboratories. By occupying minimal counter space and greatly reducing technician man-hours, this series allows organizations to operate facilities in a much more cost-effective fashion.



NEW

Product video is available on the website

3 easy steps

1 LOAD

2 RUN

3 OBTAIN

SPECIFICATIONS

Processing time	45–60 min
Processing capability	1–12 samples per run
Extraction technology	magnetic particle separation technology
Protocol	programmed by scanning a barcode
Protocol input	barcode scanner
Sample volume	10–2,000 µl (depending on the kit)
Elution volume	50–400 µl
Connection to PC	not required
Display	LCD (20 × 4)
Certification	CE IVD
Nominal operating voltage	110–240 V, 50/60 Hz
Dimensions (W×D×H)	560 × 590 × 510 mm
Weight	55 kg

Features:

- Advanced magnetic bead technology;
- Reaction chamber with patented parts;
- Piercing-pin system for elimination of cross-contamination;
- Walk-away automation;
- Reliable quality;
- No PC required;
- Ready-to-use reagent cartridges;
- 3 easy steps: LOAD-RUN-OBTAIN.

Reagents for **BioMagPure 12 Plus**

ORDERING INFORMATION:

Name	Description	Cat. number
BioMagPure 12 Plus	Compact Bench-Top Robotic Workstation For Automated Nucleic Acid Purification.	BS-060202-AAA
Blood DNA Extraction Kit 200	Blood DNA Extraction Kit is used with the BioMagPure 12 Plus instrument to extract DNA from 10-400µl mammalian whole blood, suspension of mammalian blood cells.	BS-060201-AK
Blood DNA Extraction Kit 1200	Blood DNA Extraction Kit is used with the BioMagPure 12 Plus instruments to extract gDNA from 400-1000µl mammalian blood, suspension of mammalian blood cells.	BS-060201-BK
Viral Nucleic Acid Extraction Kit	Viral Nucleic Acid Extraction Kit is used with the BioMagPure 12 Plus instrument to extract Viral DNA or RNA from human biological specimens such as serum, plasma, and other cell-free fluids.	BS-060201-CK
Tissue DNA Extraction Kit	BioMagPure 12 Plus Tissue DNA Extraction Kit is used with the BioMagPure 12 Plus instrument to extract genomic DNA from a variety of animal tissues, swab samples and bloodstain.	BS-060201-DK
Cultured Cell DNA Extraction Kit	Cultured Cell DNA Extraction Kit is used with the BioMagPure 12 Plus instrument to extract genomic DNA from culture cells and buffy coat.	BS-060201-EK
Bacterial DNA Extraction Kit	Bacterial DNA Extraction Kit is used with the BioMagPure 12 Plus instrument to extract genomic DNA from both Gram-positive and Gram-negative bacteria.	BS-060201-FK
HPV DNA Extraction Kit for Swab	HPV DNA Extraction Kit is used with the BioMagPure 12 Plus instrument for DNA extraction of the Human Papillomavirus (HPV) from cervical cell samples which collected by cervical brush or genital swab in liquid-based Medium (e.g. Hologic Thinprep PreservCyt®, BD SurepathTM, etc.) or other STM (sample transport media) preservation solutions(e.g. QIAGEN DNA PAP Cervical sampler, Roche Cobas® PCR Cell Collection Media, Hybribio cell preservation solution, etc.).	BS-060201-GK
TB DNA Extraction Kit	TB DNA Extraction Kit is used with the BioMagPure 12 Plus instrument for extraction of genomic DNA of *Mycobaceteria spp.* (e.g. *Mycobacterium tuberculosis*) from different specimen.	BS-060201-IK
FFPE DNA Extraction Kit	FFPE DNA Extraction Kit is used with the BioMagPure 12 Plus instrument for extraction of genomic DNA from FFPE (Formalin-Fixed, Paraffin-Embedded) tissue samples. Providing good quality, high integrity DNA for Molecular diagnosis and research works	BS-060201-JK
Forensic DNA Extraction Kit	Forensic DNA extraction kit is used to extract and isolate genomic DNA from forensic samples.	BS-060201-KK
Viral/Pathogen Nucleic Acids Extraction Kit A	Viral/Pathogen Nucleic Acids Extraction Kit A is used with the BioMagPure 12 Plus instrument to extract Viral and bacterial DNA/RNA from cell-free samples, such as serum, plasma, and other cell-free body fluids.	BS-060201-LK
Viral/Pathogen Nucleic Acids Extraction Kit B	Viral/Pathogen Nucleic Acids Extraction Kit B is used with the BioMagPure 12 Plus instrument to extract viral and bacterial DNA/RNA from swab samples (cell-rich samples).	BS-060201-MK
Viral RNA Extraction Kit	Viral Nucleic RNA Extraction Kit is used with the BioMagPure 12 Plus instrument to extract Viral RNA from human biological specimens such as serum, plasma, and other cell-free fluids.	BS-060201-NK
Plant DNA Extraction Kit	Plant DNA Extraction Kit is used with the BioMagPure 12 Plus instrument to extract genomic DNA from plants (leaf, seeds and spores) and fungal tissues. Up to 100 mg of tissue can be used for purification.	BS-060201-OK
Total RNA E xtraction Kit	Total RNA Extraction Kit is used with the BioMagPure 12 Plus instrument to extract total RNA from whole blood, blood cells, animal tissue, plant tissue, yeast or cultured cells.	BS-060201-PK
Viral Nucleic Acid Large Volume Extraction Kit	Viral Nucleic Acid Large Volume Extraction Kit is used with the BioMagPure 12 Plus instrument to extract Viral DNA or RNA from human biological specimens such as serum, plasma, and other cell-free fluids.	BS-060201-QK
CFC DNA Extraction Kit Large Volume	CFC DNA Extraction Kit Large Volume - is used with the BioMagPure 12 Plus instrument to extract circulating DNA from plasma serum or cell-free body fluids sample volume ranging up to 5 ml.	BS-060201-RK

MagSorb-16,
Magnetic rack for manual nucleic acid extraction

DESCRIPTION

MagSorb-16 is a magnetic rack designed to isolate nucleic acids utilizing magnetic particles. High-performance permanent neodymium magnets are built into the rack.

MagSorb-16, consists of two convenient quick-detachable tube holders that hold up to 16 tubes (1.5–2 ml) and a magnetic stand on which the tube holders are placed.

Magnetic beads based NA extraction methods offer quick and efficient separation of genetic material from cellular leftovers. Wide variety of commercially available extraction kits manufactured by companies like ThermoFisher Scientific, Promega, Qiagen etc. are available in the market.

Our **MagSorb-16** magnetic rack can be used together with any manufacturers magnetic beads based NA extraction reagents that allow working in 1.5–2.0 ml tube format.

SPECIFICATIONS

Number of places in stand	16
Tube's volume	1.5–2 ml
Type of tubes	Eppendorf or equivalent

ORDERING INFORMATION	Cat. number
MagSorb-16, magnetic rack	BS-010601

PCR Analysis

Sample resuspendation and droplet spin down

FVL-2400N
(tubes)

CVP-2
(PCR-plates)

Real time PCR detection

BioQuant-96

Reagents

abTes COVID-19 qPCR kit
(Reagents are CE-IVD certified — among WHO listed kits.)

NEW BioQuant-96, Real-time PCR detection system

DESCRIPTION

BioQuant-96 is the newest product of Biosan Molecular diagnostic product family.

It has adopted innovative thermoelectric refrigeration technology, brand-new light source and light path design. Detection from the top allows using different consumables – 0,2 tubes, 8-tube strips and semi-skirted and non-skirted 96-well PCR plates. The unique constant current power and 6-zone independent temperature control method ensure more rapid, correct and stable fluorescence quantitative analysis, while maintaining its excellent performance in lowest possible energy consumption.

Device is available in 5-channel and 6-channel configuration. Meanwhile, it has been added with functions including independent temperature control, low temperature storage of sample at 4°C and FAST mode for more faster cycling (confirm reagent compatibility with fast mode).

BioQuant-96 is comprehensively realizing automatic gain setting and improving user experience. It will fully meet the demand of scientific research laboratories and registered as I (A) class Medical device in EU it also will fully meet the requirements of any diagnostic laboratory.

SPECIFICATIONS

Sample capacity	0.2 ml single tube (transparent cap), 96 × 0.2 (0.1) ml Plate (transparent cap), 8-strip tubes (transparent cap)
Dynamic range	1~10^{10} copies
Excitation wavelength	300–800 nm
Emission wavelength	500–800 nm
Channels	5
Temperature setting range	4~105°C (increment: 0.1°C)
Heating/coolling rate	6.0°C/s / 5.5°C/s
Temperature accuracy	≤±0.1°C
Temperature fluctuation	≤±0.3°C
Temperature uniformity	≤±0.3°C
Temperature control mode	BLOCK/Tube simulation mode (automatic control based on sample volume)
Sample volume	5~100 µl
Gradient temperature range	1~36°C
Hot-lid temperature range	30~110°C (adjustable default: 105°C, Automatic Hot-lid)
Repeatability	5%
Scan mode	Entire plate or designated line
Program	Max. 20 segments for each program, max. 99 cycles
Continuous operation	+
Scan period	5.5 s
Software	BioQuant-96 Software included
Operating system	Windows 7/8/10
Minimum PC requirements	Memory: 512 MB, HD: 10 GB, CPU: Pentium® 4, Virtual Memory: ≥1,000 MB
Nominal operating voltage	100–240 V; ~50/60 Hz
Power consumption	600 W
Dimensions (W×D×H)	490 × 290 × 391 mm
Number of sockets	USB adapter, Bluetooth adapter
Certification	CE-IVD
Interface	Built-in Touchscreen

ORDERING INFORMATION

	Cat. number
BioQuant-96	BS-050110

abTes COVID-19 qPCR kit, Reagents

COVID-19 is a single-stranded, positive-sense RNA virus that caused a nationwide outbreak of serious respiratory problems across the world. This RNA virus is capable of person-to-person transmission, spreading very rapidly and affecting almost every country. It is genetically highly related to SARS and MERS coronaviruses.

Together with our partners, AITbiotech, we are participating in the global fight against COVID-19, providing reliable Real-Time PCR kits to detect nCoV-2019 virus in clinical samples.

Kit is CE-IVD certified
and is among WHO listed kits.

The **abTES COVID-19 qPCR I Kit** is a qualitative real-time polymerase chain reaction (qPCR) kit that enables simultaneous detection of two COVID-19 — specific signature regions from its non-structure polypeptide (orf1a) in a single reaction. It also includes detection of the human housekeeping gene, GAPDH, as an Internal Control (IC) to identify possible PCR inhibitions from sample processing.

The kit contains all the necessary PCR reagents for rapid, sensitive, and specific detection using target-specific primers and double-labelled hydrolysis probes. This kit has been validated on samples extracted from sputum, nasopharyngeal and throat swabs.
Amount per kit — **100 tests**

Sensitivity: 2.2 copies/µl or 11 copies/rxn

Validated sample types (as recommended by CDC):

- Nasopharyngeal wash/aspirate or nasal aspirate;
- Nasopharyngeal & oropharyngeal swabs;
- Bronchoalveolar lavage;
- Tracheal aspirate;
- Sputum;
- Serum.

ORDERING INFORMATION:	Cat. number
abTES COVID-19 qPCR Kit	300141

Enzyme-linked immunosorbent assay (ELISA)

Sample preparation in laminar flow cabinet

Biological Safety Cabinet class II

Incubation

PST-60HL

PST-60HL-4

PSU-2T

Washing (Automated)

IW-8

3D-IW8

Washing (Manual)

FTA-1 with MA-8

FTA-2i

Reading and Analysis

+

HiPo MPP-96
Microplate Photometer
with QuantAssay software

Reagents of ELISA*

* — Information about current offers on the products of other manufacturers are available in the corresponding sections of our site www.biosan.lv/en/products

IW-8, Intelispeed Washer

CE IVD Certification available

Premium
Product Class

DESCRIPTION

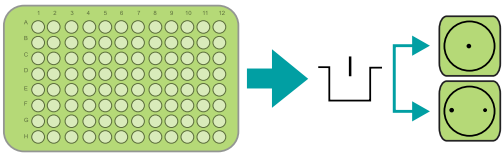
Intelispeed Washer IW-8 is designed to wash standard flat-bottom (two point aspiration) and U-shape (only in single point aspiration) 96 well plates and microstrips. The unit is fully programmable, ensuring multi-step solution ripening, aspiration (aspiration, combination of aspiration/liquid dispensing and soaking, as well as soaking cycle during a particular time).

The unit has 100 user-defined programs. Standard version is supplied with an 8-channel washing head for dispensing/aspiration, three bottles for washing and rinsing solutions, a waste bottle and bottle with filter. Optional 4-channel washing solution weight logger, **4 CHW Logger** is available.

The unit is designed for washing standard 96-well plates during analyses.

The unit provides:

- Washing mode;
- Rinsing mode;
- Mixing mode;
- Single point, two point aspiration;
- Possibility of additional solution mixing during time gap between two work cycles;
- Possibility to use microtest plates by different manufacturers, ensured by automated plate set up (adjusting to different depths of plate wells);
- Plate and strip washing mode;
- User-defined programs with adjustable parameters;
- Saving work programs.



ORDERING INFORMATION:

	Cat. number
IW-8	BS-060106-AAI
IW-8 IVD	BS-060106-IVD1
4 CHW Logger	BS-060102-AK

IW-8, Intelispeed Washer

4-channel washing solution weight logger, **4 CHW Logger** provides automatic control of rinsing solutions and waste volume. The washer shows the remaining volume for each bottle as a percentage and gives a warning message in case of low solution volume or full waste bottle when **4 CHW Logger** is connected.

4 CHW Logger Specifications:

Max. loading per scale cup	2 kg
Dimensions (W×D×H)	267 × 252 × 97 mm
Weight	3 kg

Choice of 3 washing liquid bottles	
Minimum dispense volume	25 µl
Maximum dispense volume	1,600 µl
Dispense increment	25 µl
Dispensing accuracy	±2.5%
Allowed residual liquid volume not more than 2 µl in plate well	
Number of wells washed simultaneously	8
Number of washing cycles for each channel	1–15
Timer sound signal	yes
Aspiration time	0.2–3 s
Aspiration/dispensing speed	3 levels
Max. number of channels in a program	2
Soaking time	0–300 s (increment 10 s)
Shaking time	0–150 s (increment 5 s)
Number of washed rows	1–12
Time of plate single wash (350 µl), not more	45 s
Number of programs	101
Plate platform and washing head movement	automated
Indication of operation modes	8-line LCD
Dimensions (W×D×H)	375 × 345 × 180 mm
Weight with accessories	9.6 kg
External power supply	DC 12 V, 5 A
Consumed power	22 W

The unit is designed for use in closed laboratory rooms at temperatures from +4 to +40°C and relative humidity up to 80% at +31°C decreasing linearly to 50% relative humidity at 40°C

3D-IW8, Inteliwasher

Premium
Product Class

CE IVD Certification available

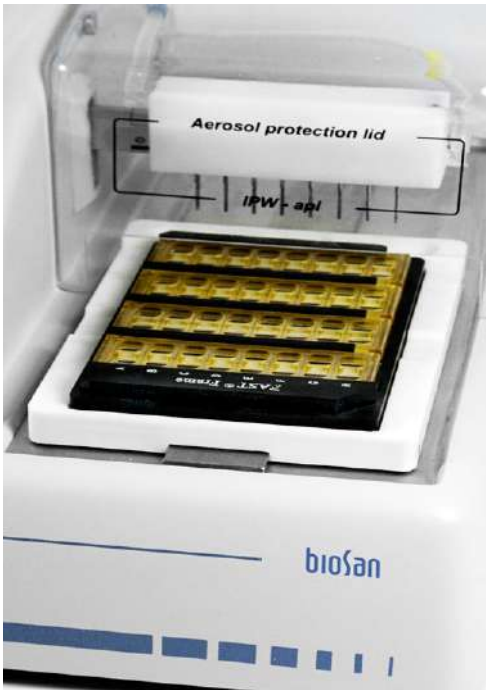
Product video is available on the website

DESCRIPTION

Inteliwasher **3D-IW8** series microplate washer is designed to wash various types of standard 96-well microtitre plates, microstrips as well as microarrays on FastFRAME (rectangular well shape). It is suitable for washing wells with different bottom shapes: flat, U-shape and V-shape. The unit is fully programmable, ensuring multi-step solution ripening, aspiration (aspiration, combination of aspiration/liquid dispensing and soaking, as well as soaking cycle during a particular time). Dispense system of liquid dosage for each channel separately.

The unit provides:

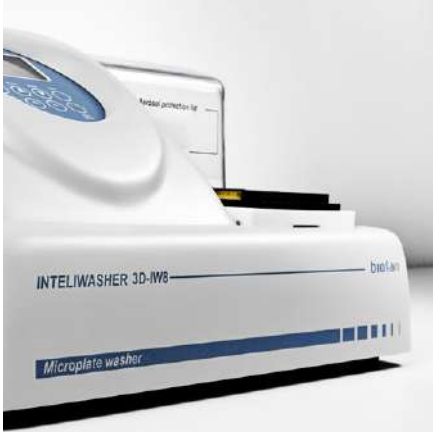
- Washing mode;
- Rinsing mode;
- Mixing mode;
- Single point, two point, circular (circle or rectangular path) aspiration;
- Possibility of additional solution mixing during time gap between two work cycles;
- Possibility to use microtest plates by different manufacturers, ensured by automated plate set up (adjusting to different depths of plate wells);
- Round-bottom plate and strip washing mode;
- Possibility of user-defined programs with adjustable parameters.



ORDERING INFORMATION:

	Cat. number
3D-IW8	BS-060102-AAI
3D-IW8 IVD	BS-060102-IVD1
4 CHW Logger	BS-060102-AK

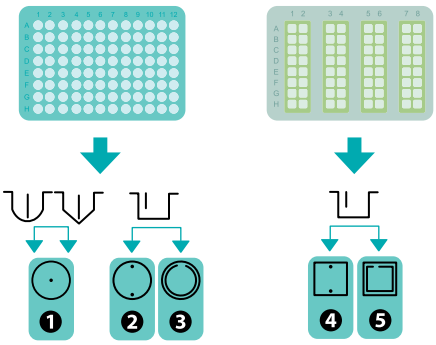
3D-IW8, Inteliwasher



The unit has 50 programs divided into 5 following aspiration categories (see figure bellow):

1. **Type 1** (1.0–1.9) **IPF96 U/V** is intended for round and V-shape immunoplates, 1 point aspiration.
2. **Type 2** (2.0–2.9) **IPF96 FLAT-2** is intended for flat-bottom shape immunoplates, 2 point aspiration.
3. **Type 3** (3.0–3.9) **IPF96 FLAT-C** is intended for rectangular shape immunoplates, full-circle aspiration direction.
4. **Type 4** (4.0–4.9) **FastFRAME-2** is intended for multi-slide plate* with rectangular wells, 2 point aspiration.
5. **Type 5** (5.0–5.9) **FastFRAME-C** is intended for multi-slide* plate with rectangular wells, full-square aspiration direction.

* — The **Fas tFRAME** multi-slide plate or analog plate of another manufacturer, that is compatible with standard 25×76 mm (1×3 inch) glass slides.



SPECIFICATIONS

Minimum dispense volume	25 µl
Maximum dispense volume	1,600 µl
Dispense increment	25 µl
Dispensing accuracy	±2.5%
Allowed residual liquid volume in plate well, not more	2 µl
Number of wells washed simultaneously	8
Number of washing cycles	1–15
Timer sound signal	yes
Aspiration time	1–3 s
Final aspiration time	1–3 s
Aspiration/dispensing speed	3 levels
Max. number of channels in a program	2
Choice of 3 washing liquid bottles	
Soaking time	0–300 s (increment 10 s)
Shaking time	0–150 s (increment 5 s)
Number of washed rows	1–12
Time of one plate wash (300 µl), not more	45 s
Number of programs	50
Plate platform and washing head movement	automated
Indication of operation modes	LCD, 8-line
Dimensions (W×D×H)	375×345×180 mm
Weight with accessories	9.9 kg
External power supply	Input AC 100–240 V 50/60 Hz, Output DC 12 V
Input current/ power consumption	12 V, 1.8 A / 22 W
The unit is designed for use in closed laboratory rooms at temperatures from +4°C to +40°C and relative humidity up to 80% at +31°C decreasing linearly to 50% relative humidity at 40°C.	

4-channel washing solution weight logger, **4 CHW Logger,** provides automatic control of rinsing solution and waste volumes. The washer shows the volume for each bottle as a percentage and gives a warning message in case of low solution volume or full waste bottle when **4 CHW Logger** is connected.

4 CHW LOGGER SPECIFICATIONS:

Max. loading per scale cup	2 kg
Dimensions	267 × 252 × 97 mm
Weight	3 kg

HiPo MPP-96, Microplate Photometer

DESCRIPTION

Microplate Photometer HiPo is a compact tabletop device for measuring optical density — results of ELISA and microbiological studies in 96-well microplates. Photometer is controlled and outputs data via computer. An extensive range of additional interference filters is available (with average increment of 10 nm).

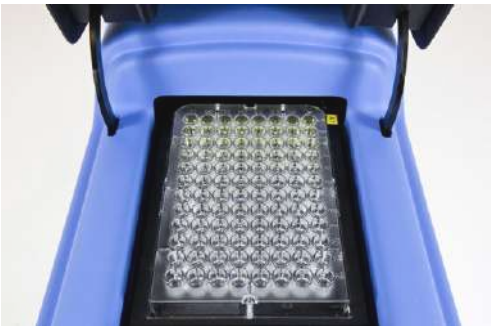
The device is supplied with specialized software **QuantAssay**. Features of **QuantAssay** software:

- ELISA assays of any complexity can be carried out via robust assay editor with help of Assay Wizard
- Quantitative assay, includes up to 20 standards
- Avidity/Affinity assays
- Multiplex assays with up to 7 assays on one plate
- Qualitative assay includes up to 11 controls
- BestFit function for selecting the best calibration curve
- User-friendly interface: get your results in 3 clicks
- Save, load and export results
- LIMS export integration
- Creates visual reports

Smart Plus
Product Class

USB connection

Product video is available on the website



SPECIFICATIONS

Detection mode	Absorbance
Light source	LED, self-calibrating
Photodetector	8 silicon photodiodes
Plate type	96-well microplates (including strip-well microplates)
Reading Speed	5–8 s per wavelength
Measurement modes	Endpoint, Kinetic
Measurement channels	8
Reference channel	1
Measurement range	0–4.3 OD
Resolution	0.0001 OD
Wavelength range	400–700 nm
Wavelength selection	up to 8* filters on wheel standard filters 405, 450, 492 and 620 nm
Shaking	4 amplitudes, 4 speeds
Software	**QuantAssay**
PC system requirements	Intel/AMD Processor, 1 GB RAM, Windows Vista/7/8/10, USB
Overall dimensions (W×D×H)	140 × 300 × 130 mm
Weight	4.6 kg
External power supply	Input AC 100–240 V 50/60 Hz, Output DC 12 V

* — It is possible to install up to 4 additional filters on request. Additional filters are available in two specifications: optical absorption not less than 3.5 OD or 4.3 OD

Accuracy (405, 450, 492, 620 nm)	
0.000–2.000 OD	≤ (0.5 % ±0.010 OD) typical
2.000–3.000 OD	≤ (1 % ±0.010 OD) typical
Precision / Reproducibility (405, 450, 492, 620 nm)	
0.000–2.000 OD	≤ (0.5 % ±0.005 OD)
2.000–3.000 OD	≤ (1.0 % ±0.005 OD)

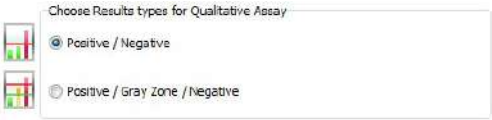
ORDERING INFORMATION:	Cat. number
HiPo MPP-96	BS-050108-A02
Optional accessories:	
OD Plate, Verification tool	BS-050108-AK
Additional filters*	On request

SOFTWARE UPDATE Quant Assay, Software for HiPo MPP-96

Software video
is available on the website

ELISA assays of any complexity can be carried out via robust assay editor with help of **Assay Wizard:**

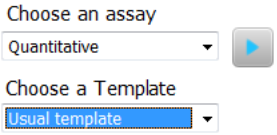
Qualitative assay includes up to 11 controls;
Results can be outputted as Positive/Negative or Positive/Gray Zone/Negative;
Gray zone can be set as symmetric and non-symmetric;
Positivity ratio can be outputted



Avidity/Affinity results be outputted as Positive/Negative or Positive/Gray Zone/Negative;
Avidity index margins can be easily set;
Avidity Index can be outputted

		Margin			Result
If AI	<	0.30			+
If AI	>=	0.30	and	0.50 <	++
If AI			>=	0.50	+++

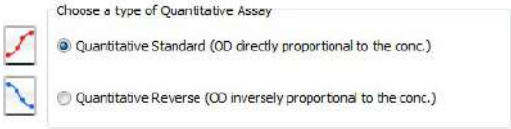
User-friendly interface: get your results in 3 clicks:
Choose an assay, a template and press Play



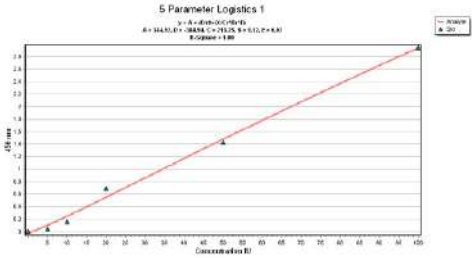
Save, load and export results

Creates reports: Excel, PDF, CSV

Quantitative assay includes up to 20 standards;
User can choose Standard/Reverse type of curves



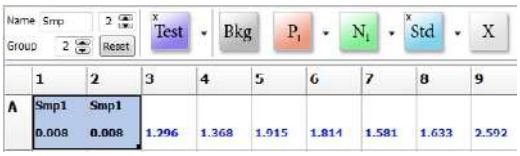
BestFit function for selecting the best calibration curve from following models:
4/5 Parameters logistics, Piece-wise linear, Linear, Index/Logarithm/Exponent/Cubic regression models



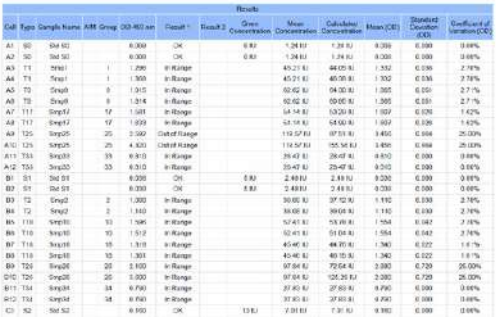
Install up to 7 assays on one plate by using **multiplex**

	1	2	3	4	5	6	7
A	Smp1 0	Smp1 1	Smp1 2	Smp1 3	Smp1 4	Smp1 5	Smp1 6
B	Smp2 0	Smp2 1	Smp2 2	Smp2 3	Smp2 4	Smp2 5	Smp2 6
C	Smp3 0	Smp3 1	Smp3 2	Smp3 3	Smp3 4	Smp3 5	Smp3 6

Easy fill of the samples



PDF report contains: Experiment information, Results table, List of variables and it's calculations, Interpretation parameters



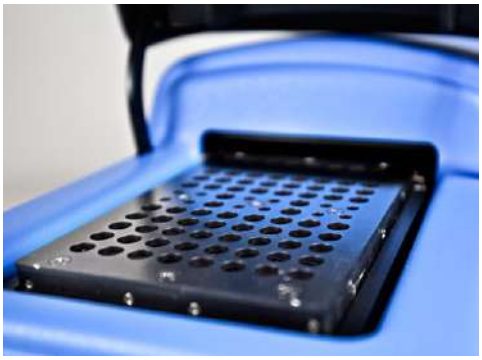
OD Plate, Verification Instrument for MPP-96 HiPo

DESCRIPTION

OD Plate is the measurement verification instrument for microplate photometer MPP-96 HiPo. The instrument is designed to verify the accuracy and precision of measurements of the photometer at six levels of nominal optical density: 0.3; 0.6; 1.0; 2.0; 3.0; 4.0 OD. The instrument is supplied with the following verification wavelength range: 405–700 nm.

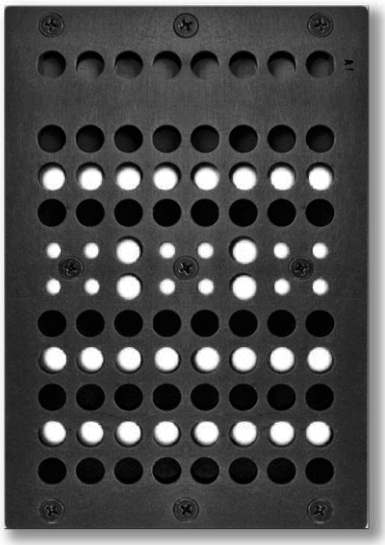
Instrument is provided in a shockproof container with an USB flash drive containing:

- Copy of measurement results
- User manual



SPECIFICATIONS

Nominal optical density levels	0.3; 0.6; 1.0; 2.0; 3.0; 4.0 OD (±0.1 OD)
Verification wavelength range	405, 414, 450, 480, 492, 515, 540, 550, 560, 568, 580, 594, 620, 630, 650, 690, 700 nm
Instrument dimensions	128 × 86 × 12 mm
Net weight	0.3 kg



ORDERING INFORMATION:

	Cat. number
OD Plate, Verification tool	BS-050108-AK

General Information

Safety
All Biosan laboratory equipment meets the requirements of International Standard IEC 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use, and applicable specific parts e.g. IEC 61010-2-010: particular requirements for laboratory equipment for the heating of materials, IEC 61010-2-020: particular requirements for laboratory centrifuges, IEC 61010-2-051: particular requirements for laboratory equipment for mixing and stirring.

CE Mark
All Biosan laboratory equipment bears a CE mark to indicate that it meets the requirements of all applicable European Directives.
Compliance with the Low Voltage Directive is demonstrated by meeting EN 61010 (as indicating in paragraph on safety) and the EMC Directive by meeting EN61326-1: EMC requirements for electrical equipment for measurement, control and laboratory use. Some products also fall within the scope of IVD Directive.

Electrical Supplies
All standard Biosan laboratory equipment is available for voltages within the range 220–240 V, 50 or 60 Hz. Most of the equipment is also available for voltages 100–120 V, 50 or 60 Hz.

Quality
The Biosan Quality Management System complies with the requirements of LVS EN ISO 9001:2015, the scope of supply is development, production, sales and service of laboratory equipment.
High quality customer service and readiness to meet ever growing customer requirements to modern equipment are the main goals of ISO 9001 compliance (certified since 2004).

Environmental Conditions
Biosan laboratory equipment is designed for operation in cold rooms, incubators (excluding CO_2 incubators) and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

Guarantee and After Sales Service
Biosan equipment is reliable, designed and built to provide years of trouble-free service. Most Biosan equipment is guaranteed for two years against faulty materials and workmanship and premium product class up to 3 years upon registration in our website support section. Warranty terms and conditions are indicated in the product manual. All Grant standard laboratory equipment is guaranteed for three years against faulty materials and workmanship. Local distributors and service centres provide necessary technical assistance within and outside the warranty period.Biosan technical support team provides direct support offering the best solution for assistance upon receipt of request via e-mail service@biosan.lv or forms available at Technical Support section of Biosan web-site.

World Wide Availability and Support for Biosan Laboratory Equipment
Biosan laboratory equipment and specialist technical support is available world-wide. Please, visit multilingual (English, French, German, Italian, Latvian, Russian, Spanish) web-site http://www.biosan.lv for further product information (videos, brochures, manuals, articles), placing enquiries and locating your locally appointed distributor or contact customer service direct at service@biosan.lv.

As Biosan is committed to a continuous program of improvement, specifications may be changed without notice.

PRODUCT CLASS FEATURES	Basic Plus Product Class **Basic Plus**	Premium Product Class **Premium**	Smart Plus Product Class **Smart Plus**
Designed to complete basic sample preparation tasks	•	•	•
Designed to complete sophisticated sample preparation tasks		•	•
Advanced specifications and special features		•	•
PC interface for logging, control, programming, alarms, online monitoring functions			•
Modern Bioform design	•	•	•
Small footprint	•	•	•
Low power consumption	•	•	•
Safe 12V DC	•	•	•
High quality	•	•	•
2 year warranty + 3rd year purchased via distributors	•		•
2 year warranty + 3rd year for free upon product registration		•	

Applications and Articles

Reverse-Spin® Technology — Innovative Principle of Microbial Cultivation.
biosan.lv/rts-tech

Investigation of the effect of aeration on growth dynamics, respiratory rate and pH changes of the aerobic bacterium *E. coli* BL21 cultivated in RTS-8 PLUS single-use bioreactor.
biosan.lv/rts-growth

Development and evaluation of DNA amplicon quantification.
biosan.lv/uv-box

UVR-M and UVR-Mi, UV Air Recirculators Test Report.
biosan.lv/uvr-test

Germicidal and Antiviral decontamination of air by UV irradiation and UV recirculator method.
biosan.lv/uv-effect

how to choose

A PROPER SHAKER, ROCKER, VORTEX

biosan
Medical–Biological Research & Technologies

Sample volume 10^3 ... 10^2 ml

Erlenmeyer flask and Cultivation flask

PSU-20i, Orbital Shaker

ES-20/80, Orbital Shaker-Incubator

Applications:
- *Microbiology*
- *Extraction*
- *Cell cultivation*

PSU-10i, Orbital Shaker

ES-20, Orbital Shaker-Incubator

Applications:
- *Agglutination*
- *Gel staining/destaining*

MR-12, Rocker-Shaker

Sample volume 10^1 ml

Petri dishes, vacutainers and tubes up to 50 ml

Multi Bio RS-24, Programmable rotator

Multi RS-60, Programmable rotator

Bio RS-24, Mini-Rotator

Applications:
- *Microbiology*
- *Extraction*
- *Cell cultivation*
- *Hematology*

V-1 plus, Vortex

RTS-1 and RTS-1C, Personal bioreactor

MSV-3500, Multi Speed Vortex

MR-1, Mini Rocker-Shaker

Applications:
- *Nucleic acid Analysis*
- *Molecular Analysis*
- *Protein Analysis*
- *Genomic Analysis*

Multi Bio 3D, Mini Shaker

Applications:
- *Agglutination*
- *Extraction*
- *Blot hybridisation*
- *Gel staining/destaining*

Sample volume 10^0 ... 10^{-3} ml

PCR plates, microtest plates and Eppendorf type tubes

PST-100HL, Thermo-Shaker

PST-60HL-4, Thermo-Shaker

TS-DW, Thermo-Shaker for deep well plates

PST-60HL, Thermo-Shaker

Applications:
- *ELISA Analysis*
- *Genomic Analysis*
- *Hybridization*
- *Immunology*

MPS-1, Multi Plate Shaker

PSU-2T, Mini-Shaker

CVP-2, Centrifuge vortex for PCR plates

TS-100, TS-100C, TS-100C Smart Thermo-Shakers

V-32, Multi-Vortex

COVID-19

The global coronavirus (COVID-19) outbreak marks the necessity of fast and reliable sample preparation as well as safe working environment. To facilitate products selection here are shown ready product lines to rapidly start COVID-19 sample analysis.

Preventive

Decontamination

UVR-M/UVR-Mi
UV Cleaner–Recirculators

PDS-250, PDS-10L
DNA/RNA decontamination solution

Air — Surface

ELISA based detection methods

Steps

Incubation

PST-60HL-4
Plate Shaker-Thermostat

PST-60HL
Plate Shaker-Thermostat

PSU-2T
Mini-shaker for immunology

Washing

Assist
Pipette series

Assistboy
Pipette controller

FTA-2i
Aspirator with Trap Flask

3D-IW8
Inteliwasher

Detection and analysis

HiPo MPP-96
Microplate Photometer

+

Quant Assay
Software for HiPo MPP-96

NA based detection methods

Manual preparation

Working area

UVT-S-AR
DNA/RNA UV-cleaner box

Resuspension of probes and reagents

V-1 Plus
Personal Vortex

MSC-3000
Centrifuge/Vortex Multispin

Sample lysis

TDB-120
Dry block thermostat

Sample wash

Assist
Pipette series

FTA-2i
Aspirator with Trap Flask

Elution of NA

MagSorb 16
Magnetic Rack for Manual Nucleic Acid Extraction

Microspin 12
High-speed Mini-centrifuge

Automated preparation

TS-100C Smart
Programable Termo-Shaker with cooling for microtubes and PCR plates

Biomagpure 12 Plus
Compact Bench-Top Robotic Workstation for Automated Nucleic Acid Purification (+ reagents)

Sample detection and analysis

Preparation

CVP-2
Plate centrifugation and vortexing

MSC-6000
Tube centrifugation and vortexing

Real time PCR detection

BioQuant-96
Real time PCR instrument

abTes COVID-19 qPCR kit (Reagents are CE-IVD certified – among WHO listed kits.)

Manual and automatic DNA/RNA extraction

Liquid Handling — **Assist Series Pipettes**

Incubation — **TS-100, TS-100C or TS-100C Smart**

Sample resuspendation and droplet spin down — **FVL-2400N**

or

Automatic extraction — **BioMagPure 12 Plus and reagents**

Mixing and resuspendation — **MPS-1**

Centrifugation — **Microspin 12**

Sample preparation in UV–Cabinet for PCR — **UVC/T-M-AR**

Centrifugation — **FTA-1**

FTA-2i

ncubation — **TDB-120**

Reagents — **Reagents for extraction***

* — Information about current offers on the products of other manufacturers are available in the corresponding sections of our site www.biosan.lv/en/products

Manual DNA/RNA extraction using magnetic beads technology

Sample resuspendation and droplet spin down

FVL-2400N

Sample preparation in UV–Cabinet for PCR

UVC/T-M-AR, or similar,
see UV–Cabinets for PCR

Mixing and resuspendation

MPS-1

V-1 plus

Multi Bio RS-24

Capture of magnetic beads

MagSorb-16

Centrifugation

Microspin 12

Vacuum aspiration

FTA-1

FTA-2i

Incubation

TDB-120

TS-100C

Reagents

Reagents for extraction*

* — Information about current offers on the products of other manufacturers are available in the corresponding sections of our site www.biosan.lv/en/products

PCR Analysis

Sample resuspendation and droplet spin down

FVL-2400N
(tubes)

CVP-2
(PCR-plates)

Real time PCR detection

BioQuant-96

Reagents

abTes COVID-19 qPCR kit (Reagents are CE-IVD certified — among WHO listed kits.)

Reagents

* — Information about current offers on the products of other manufacturers are available in the corresponding sections of our site www.biosan.lv/en/products

Enzyme-linked immunosorbent assay (ELISA)

Sample preparation in laminar flow cabinet

Biological Safety Cabinets class II

Incubation

PST-60HL

PST-60HL-4

PSU-2T

Washing (Automated)

IW-8

3D-IW8

Washing (Manual)

FTA-1 with MA-8

FTA-2i

Reading and Analysis

+

HiPo MPP-96
Microplate Photometer
with QuantAssay software

Reagents of ELISA*

* — Information about current offers on the products of other manufacturers are available in the corresponding sections of our site www.biosan.lv/en/products

Microbial Cell Cultivation

Sample preparation in laminar flow cabinet

Biological Safety Cabinet class II

ES-20/80

Cultivation

ES-20

ES-20/80C

Measurement

DEN-1

DEN-1B

DEN-600

or

Cultivation and Real-time OD Measurements and Logging

RTS-1

RTS-1C