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Medical-Biological Research & Technologies

DEN-1, Densitometer (suspension turbidity detector)

Basic Plus Product Class

DESCRIPTION

Densitometer is designed for measurement of cell suspension's turbidity in the range of 0.0–6.0 McFarland units (0 – 180 × 10^7 cells/ml).

Densitometer provides 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 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 concentration of colour solution, absorbing green light.

The operation principle is based on 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. We recommend to use Biosan standards to ensure full reliability, but it is acceptable to use other commercial as well as self prepared standards (e.g. BaSO4). Possibility to restore factory calibration settings.

Following calibration kits 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).
  Cat.Nr.: BS-050102-BK
- Calibration kit for glass tubes with diameter 18 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0; 5.0 McFarland Turbidity Standards ($BaSO_4$).
  Cat.Nr.: 70900
- Calibration kit for glass tubes with diameter 12 mm, set of 0.0 (blank); 0.5; 2.0; 3.0 McFarland Turbidity Standards (latex particles).
  Cat.Nr.: 21255

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 from batteries (AA).

CAT. NUMBER

BS-050102-AAF	230VAC 50/60Hz Euro plug
BS-050102-AAK	100-240VAC 50/60Hz Multi plug (EU, UK, AU, US)
BS-050102-DK	IQ OQ document
BS-050102-EK	PQ document

SPECIFICATIONS

Measurement range	0.00–15.00 McF
Display resolution	0.01 McF
Light source	LED
Measurement wavelength (λ)	λ = 565 ±15 nm
Accuracy (0.0–6.0 McF)	±3%
Measurement time	1 s
Sample volume	not less than 2 ml
Tube external diameter	12 mm, 16 mm (using A-12, A-16 adapter) or 18 mm (without adapter)
Possibility to restore factory calibration settings	+
Display	LCD
Overall dimensions (W×D×H)	165 × 115 × 75 mm
Weight	0.7 kg
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	External power supply, A-16

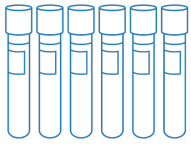
ACCESSORIES

Glass test tubes 16mm
BS-050102-MK

Glass Test Tubes 16x100mm, high borosilicate, PP Cap with silicone pad.
Packing - 100 pcs/box

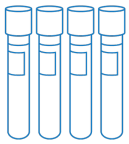
CKG16
BS-050102-BK
Calibration kit

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).



Calibration kit
70900
d18mm

McFarland Turbidity Standards, Ø18mm



Calibration kit
21255
d12mm

McFarland Turbidity Standards, Ø12mm

Glass test tubes 18mm
BS-050102-NK

Glass Test Tubes 18x100mm, high borosilicate, PP Cap with silicone pad.
Packing - 100 pcs/box

A-12
BS-050102-IK
adapter

A-12, adapter for work with tubes which are 12 mm in external diameter.

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DEN-1B, Densitometer (suspension turbidity detector)

Premium Product Class

DESCRIPTION

Densitometer is designed for measurement of cell suspension's turbidity in the range of 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 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 concentration of colour solution, absorbing green light.

The operation principle is based on 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. We recommend to use Biosan standards to ensure full reliability, but it is acceptable to use other commercial as well as self prepared standards (e.g. BaSO4). Possibility to restore factory calibration settings.

Following calibration kits 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).
  Cat.Nr.: BS-050102-BK
- Calibration kit for glass tubes with diameter 18 mm, set of 0.5; 1.0; 2.0; 3.0; 4.0; 5.0 McFarland Turbidity Standards ($BaSO_4$).
  Cat.Nr.: 70900
- Calibration kit for glass tubes with diameter 12 mm, set of 0.0 (blank); 0.5; 2.0; 3.0 McFarland Turbidity Standards (latex particles).
  Cat.Nr.: 21255

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 from batteries (AA).

CAT. NUMBER

BS-050104-AAF	230VAC 50/60Hz Euro plug
BS-050104-AAK	100-240VAC 50/60Hz Multi plug (EU, UK, AU, US)
BS-050104-AK	IQ OQ document
BS-050104-BK	PQ document

SPECIFICATIONS

Measurement range	0.00–15.00 McF
Display resolution	0.01 McF
Light source	LED
Measurement wavelength (λ)	λ = 565 ±15 nm
Accuracy (0.0–6.0 McF)	±3%
Measurement time	1 s
Sample volume	not less than 2 ml
Tube external diameter	12 mm, 16 mm (using A-12, A-16 adapter) or 18 mm (without adapter)
Possibility to restore factory calibration settings	+
Display	LCD
Independent power supply	3 × AA batteries
Overall dimensions (W×D×H)	165 × 115 × 75 mm
Weight	0.7 kg
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	External power supply, A-16 and 3 × AA batteries

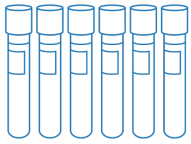
ACCESSORIES

Glass test tubes 16mm
BS-050102-MK

Glass Test Tubes 16x100mm, high borosilicate, PP Cap with silicone pad.
Packing - 100 pcs/box

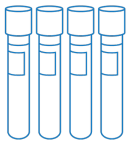
CKG16
BS-050102-BK
Calibration kit

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).



Calibration kit
70900
d18mm

McFarland Turbidity Standards, Ø18mm



Calibration kit
21255
d12mm

McFarland Turbidity Standards, Ø12mm

Glass test tubes 18mm
BS-050102-NK

Glass Test Tubes 18x100mm, high borosilicate, PP Cap with silicone pad.
Packing - 100 pcs/box

A-12
BS-050102-IK
adapter

A-12, adapter for work with tubes which are 12 mm in external diameter.

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DEN-600, Photometer

Smart Plus Product Class

DESCRIPTION

DEN-600 is a compact, portable, rechargeable battery powered photometer. DEN-600 comprises of 600 nm wavelength optical system, which enables to apply - 1) OD600 method that estimated total number of cells, 2) McFarland (McF) turbidity measurement method, 3) Bradford protein assay method for protein concentration measurement, 4) other methods that can be adjusted or optimized using 600 nm wavelength.

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 standard 10 mm path cuvettes, round bottom, conical vials or falcon tubes, therefore enabling to measure the absorbance and turbidity in Abs, OD or McF 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 and custom turbidity standards.

Common applications include:

- 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

CAT. NUMBER

BS-050109-AAA	230VAC 50/60Hz Euro plug
BS-050109-AAK	100-240VAC 50/60Hz Multi plug (EU, UK, AU, US)

SPECIFICATIONS

Light source	LED
Photodetector	Silicone photodiode
Measurement wavelength (λ)	600 nm ±10 nm
Vessel type	Cuvettes, round bottom tubes, falcon tubes
Measurement modes	Absorbance (Abs), McFarland (McF)
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
Battery type	Li-Ion
PC system requirements:	Intel/AMD Processor, 1 GB RAM, Windows Vista/7/8/10/11, USB
Overall dimensions (W×D×H)	120 × 145 × 65 mm
Weight	0.5 kg
Input current/power consumption	12 V, 0.2 A / 2.5 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V

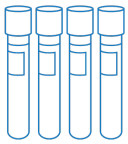
ACCESSORIES

Glass test tubes 16mm
BS-050102-MK

Glass Test Tubes 16x100mm, high borosilicate, PP Cap with silicone pad.
Packing - 100 pcs/box

CKG16
BS-050102-BK
Calibration kit

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).



Calibration kit
21255
d12mm

McFarland Turbidity Standards, Ø12mm

Verification set for Abs
BS-050109-AK

Certified reference material, neutral density glass filter set of 4 Abs calibration points - 0.3532, 1.0512, 2.0425, 2.927 (the values may vary slightly from batch to batch)

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HiPo MPP-96, Microplate Photometer

Smart Plus
Product Class

DESCRIPTION

Microplate Photometer HiPo MPP-96 is a compact tabletop device for measuring the results of ELISA and microbiological studies in 96-well microplates. Photometer is controlled and outputs data via computer. The device is supplied with specialized software QuantAssay.

Microplate Photometer HiPo MPP-96 can be used with IDEXX xChekPlus™ software. Please contact your distributor for more information.

Features of QuantAssay software:

- ELISA assays of any complexity can be carried out via robust assay editor with help of Assay Wizzard
- 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
- Creates visual reports

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)

* - optical absorption of standard filters 3.5 OD
** - up to 4 custom filters can be fitted on demand, up to 4.3 OD

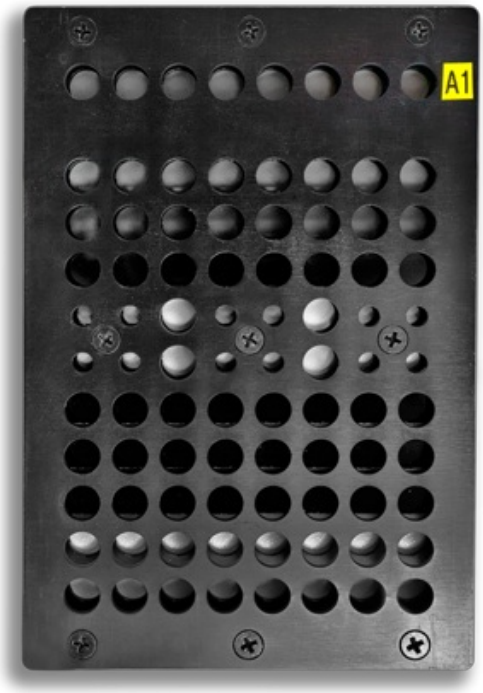
CAT. NUMBER

BS-050108-A02	230VAC 50/60Hz Euro plug
BS-050108-A03	230VAC 50/60Hz UK plug
BS-050108-A05	100VAC 50/60Hz US plug, 120VAC 60Hz US plug
BS-050108-DK	IQ OQ document
BS-050108-EK	PQ document
Optional light filters	Optional light filters
400	400 nm
455	455 nm
458	458 nm
460	460 nm
470	470 nm
480	480 nm
486	486 nm
488	488 nm
500	500 nm
508	508 nm
510	510 nm
515	515 nm
520	520 nm
532	532 nm
535	535 nm

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 and multi-label measurements
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 speed control range	4 amplitudes, 4 speeds
Software	QuantAssay Reader is compatible with IDEXX xChekPlus software
PC system requirements:	Intel/AMD Processor, 1 GB RAM, Windows Vista/7/8/10/11, USB
Overall dimensions (W×D×H)	140 x 300 x 130 mm
Weight	4.6 kg
Input current/power consumption	12 V, 5 A / 60 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V

540	540 nm
546	546 nm
550	550 nm
560	560 nm
568	568 nm
580	580 nm
589	589 nm
594	594 nm
600	600 nm
610	610 nm
632	632 nm
636	636 nm
640	640 nm
647	647 nm
650	650 nm
656	656 nm
660	660 nm
671	671 nm
676	676 nm
680	680 nm
685	685 nm
690	690 nm
694	694 nm



OD Plate

BS-050108-AK

Verification instrument for Hipo MPP-96

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 6 levels ...

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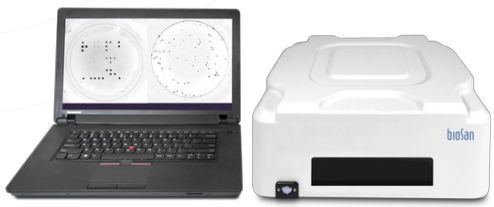
ImagerBio C, Combined Colorimetric MicroArray and ELISPOT Imager

DESCRIPTION

ImagerBio C is a compact and portable instrument designed for imaging colorimetric Microarrays and Elispots. The instrument by standard operates in brightfield and darkfield illumination modes with bottom and top illuminations respectively. The instrument is able to work with 96-well plate, a 12×8 well strip, as well as microscopic glasses (placed in a special adapter). The device is equipped with a highly sensitive CMOS camera. The instrument has an automatic mechanism of 96 well plate ejection outside the body.



Unit uses various autofocus methods.

The instrument can be operated by a 20V portable lithium-ion battery, which makes the device usable in the field studies or point-of-care.

The compact design allows the device to be carried in the hand luggage of the aircraft.

Software Features:

- Working in Microarray or Elispot interface
- End-User interface, with simplified functional, where user just chooses assay, loads samples and gets results. Visual validation step is optional
- Automated image acquisition, analysis and report generation (up to 12×12 array in 96 well plate in under 3 minutes)
- Automatic array finder via machine learning and image recognition
- Grid lay-outing (Manual and Automatic)
- Password protected Assay Developers interface with full access to the vast software parameters
- Analysis of images by the average/median intensity of the spots
- Qualitative/quantitative analysis of the arrays
- Creating Qualitative/quantitative analysis assays
- Quantitative assays with 4/5 parameter logistics functions, etc.
- Setting multi level interpretation thresholds for different type of samples in the same well (e.g. tolerance to egg and lettuce)
- Reports available in PDF, CSV, EXCEL files
- Control of camera exposure, gain, XYZ kinematics.

CAT. NUMBER

BSM000101-A01	230VAC 50/60Hz Euro plug

SPECIFICATIONS

Illumination	Channels Brightfield, Darkfield (bottom, top illumination)
Arbitrary units measurement range	0 to 65,535
NIST Certified OD measurement range (for brightfield)	0.1 to 2.0 OD
NIST Certified Diffused reflectance meas. range (for darkfield)	2 to 99
Plates and Vessels	96 well plate / 12 × 8 well strip / 4 microscope slides
Light source	LED
Lifetime of the light source	>10,000 hours
Data interface for unit controls / camera	USB 2.0 / USB 3.0
Camera	CMOS
Standard image resolution	1280×1280 pixels
Resolution	6 µm per pixel, 5–7 per user request
Image formats	png or tiff, 16 bit
Focus	Manual, Automatic, adjustable via PC
Software	Included
PC requirements	CPU: Intel i7, RAM: 8 GB Video card: Nvidia GTX 1050 Ti 4GB, or better (Capability only with Nvidia cards) SSD: 256 GB, OS: Windows 10/11 (64 bit)
Overall dimensions (W×D×H)	330×345×150 mm
Weight, w/o power supply	not more than 6 kg
External power supply	Input AC 100–240 V 50/60 Hz, Output DC 20–24 V, 2.5A

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ImagerBio F, Fluorescent MicroArray Imager

DESCRIPTION

ImagerBio F is a compact and portable fluorescent imager designed for imaging fluorescent microarrays. The instrument by standard operates on 2 channels: CY3 and CY5. The instrument is able to work with 96-well plate, a 12×8 well strip, as well as microscopic glasses (placed in a special adapter). The device takes images from the below, so the wells must have a transparent bottom. The device is equipped with a highly sensitive CMOS camera capable of taking more sensitive images in a shorter exposure times, which saves operating time. Image filtering goes through fluorescent filters. The instrument has an automatic mechanism of tray ejection outside the body.

The instrument can operate with a 20V portable lithium-ion battery, which makes the device usable in the field studies or point-of-care.

The device is available in 2, 3 or 4 channel configuration: DAPI, FITC, CY3, CY5. Qdot options are also available.

The compact design of 2/3 channel version allows the device to be carried in the hand luggage of the aircraft.

Software Features:

- Automatic array finder via machine learning and image recognition
- Grid layouting (Manual and Automatic)
- Analysis of images by the average/median intensity of the spots
- Qualitative/quantitative analysis of the arrays
- Creating Qualitative/quantitative analysis assays
- Quantitative assays with 4/5 parameter logistics functions, etc.
- Setting multi level interpretation thresholds for different type of samples in the same well (e.g. tolerance to egg and lettuce)
- Report exports to PDF, CSV, EXCEL
- Control of camera exposure, gain, XYZ kinematics

CAT. NUMBER

	2 channels
BSM000102-A01	230VAC 50/60Hz Euro plug
	3 channels
BSM000103-A01	230VAC 50/60Hz Euro plug
	4 channels
BSM000104-A01	230VAC 50/60Hz Euro plug

SPECIFICATIONS

Fluorescence channels	CY3, CY5
Optional Fluorescence channels	DAPI, FITC, CY3, CY5, Qdots
Arbitrary units measurement range	0 to 65,535
Plates and Vessels	96 well plate / 12 × 8 well strip / 4 microscope slides
Light source	Laser
Lifetime of the light source	>10,000 hours
Data interface for unit controls / camera	USB 2.0 / USB 3.0
Camera	3 MP, CMOS
Standard image resolution	1280×1280 pixels
Resolution	6 µm per pixel, 5–7 per user request
Image formats	png/tiff 16 Bit, or other on request
Focus	Manual, adjustable via PC
Exposure	Controllable, up to ~10 s
Software	Included
PC requirements	CPU: Intel i7, RAM: 8 GB Video card: Nvidia GTX 1050 Ti 4GB, or better (Capability only with Nvidia cards) SSD: 256 GB, OS: Windows 10/11 (64 bit)
Overall dimensions (W×D×H)	330×345×150 mm (2/3 channel)
Weight, w/o power supply	not more than 8 kg (2 channel)
External power supply	Input AC 100–240 V 50/60 Hz, Output DC 20–24 V, 2.5A

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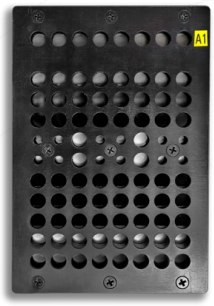
OD Plate, Verification instrument for Hipo MPP-96

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 6 levels of nominal optical density: 0.3; 0.6; 1.0; 2.0; 3.0; 4.0 OD. The standard range is at following 17 Centre Wavelengths (CWL (± 1 nm)): 405, 414, 450, 480, 492, 515, 540, 550, 560, 568, 580, 594, 620, 632, 650, 690, 700.
Optionally, the plate can be verified at any following Centre Wave-lengths (CWL (± 1 nm)): 400, 405, 414, 420, 422, 430, 436, 440, 442, 445, 450, 455, 458, 460, 470, 473, 480, 486, 488, 492, 500, 505, 508, 510, 515, 520, 532, 540, 546, 550, 560, 568, 580, 589, 594, 600, 610, 620, 632, 636, 640, 647, 650, 656, 660, 671, 676, 680, 685, 690, 694, 700 nm.

Instrument is provided in a shockproof case and USB drive containing the verification data and software.
Included is copy of the calibration certificate of reference materials issued by accredited bodies.



SPECIFICATIONS

Nominal optical density levels	0.3; 0.6; 1.0; 2.0; 3.0; 4.0 OD (±0.1 OD)
Available verification wavelengths range	400 - 700 nm
Overall dimensions (W×D×H)	86 x 128 x 12 mm
Weight	0.3 kg

CAT. NUMBER

BS-050108-AK	OD Plate, verification instrument

HiPo MPP-96
BS-050108-A02
Microplate Photometer

Microplate Photometer HiPo MPP-96 is a compact tabletop device for measuring the results of ELISA and microbiological studies in 96-well microplates. Photometer is controlled and outputs data via computer. The ...

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RTS-1, Personal bioreactor

Smart Plus Product Class

DESCRIPTION

RTS-1 is personal bioreactor which 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 singleuse 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.

- Reverse–Spin® mixing principle in 50 ml falcon tubes allows to achieve high kLa (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 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 to remotely monitor the process of cultivation while at home or using a mobile phone

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 10 units simultaneously to 1 computer
- Remote monitoring option (requires internet connection)
- Cycling/Profiling options
- User manual calibration possibility for most cells

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

CAT. NUMBER

	Including TPP TubeSpin® Bioreactor vessels 50ml, 20pcs
BS-010158-A04	230VAC 50/60Hz Euro plug
BS-010158-A05	230VAC 50/60Hz UK plug
BS-010158-A03	230VAC 50/60Hz AU plug
BS-010158-A02	100VAC 50/60Hz US plug, 120VAC 60Hz US plug

SPECIFICATIONS

Measurement range	0–10 OD at 10–20ml volume (0–19 OD λ600 nm equivalent) 0–8 OD at 20–30ml volume (0–15.2 OD λ600 nm equivalent)
Measurement precision	±0.3 OD
Light source	NIR Light diode
Measurement wavelength (λ)	850 nm
Measurement periodicity per hour	1–60
Cultural media volume	10–30 ml
Temperature setting range	+25°C ... +70°C
Temperature control range	5°C above ambient ... +70°C
Temperature stability	±0.1°C
Display	LCD
Speed control range	50–2,000 rpm
Max. number of units connected to the software	10
Type of tube for aerobic cultivation	50 ml tube with membrane filter (TubeSpin® Bioreactor 50, TPP®)*
Type of tube for anaerobic cultivation	50 ml tube with membrane filter (TubeSpin® Bioreactor 50, TPP®)* * — it is also possible to use other manufacturer tubes of the same type, e.g. Corning® 50ml Mini Bioreactor, but the device rotor must be modified. It is possible to request this modif.
Minimum PC requirements	Intel/AMD Processor, 1 GB RAM Windows Vista/7/8/8.1/10/11, USB 2.0 port
Optimal PC requirements	Intel/AMD Processor, 3 GB RAM Windows Vista/7/8/8.1/10/11, USB 2.0 port
Overall dimensions (W×D×H)	130 × 212 × 200 mm
Weight	1.7 kg
Input current/power consumption	12 V, 3.3 A / 40 W
External power supply	Input AC 100–240 V, 50/60 Hz; Output DC 12 V

ACCESSORIES

USB 2.0 Hub 10 × ports
BS-010158-BK

TubeSpin® Bioreactor 50 - 20
BS-010158-AK

50 ml tubes with membrane filter TPP TubeSpin® Bioreactor 50, 20 pcs.

TubeSpin® Bioreactor 50 - 180
BS-010158-CK

50 ml tubes with membrane filter TPP TubeSpin® Bioreactor 50, 180 pcs.

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RTS-8, Personal multi-channel bioreactor with non-invasive real time OD measurement

Smart Plus Product Class

DESCRIPTION

RTS-8 is a personal bioreactor that utilizes 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

- 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

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

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

CAT. NUMBER

	Including TPP TubeSpin® Bioreactor vessels 50ml, 20pcs
	Calibration E.coli
BS-010168-A01	230VAC 50Hz Euro plug
BS-010168-A04	230VAC 50Hz UK plug
BS-010168-A03	120VAC 50/60Hz US plug
BS-010168-A05	230VAC 50/60Hz AU plug
	Calibration S.Cerevisiae - optional
BS-010168-A09	230VAC 50/60Hz Euro plug
BS-010168-A07	230VAC 50/60Hz UK plug
BS-010168-A08	120VAC 50/60Hz US plug
BS-010168-A06	230VAC 50/60Hz AU plug
	Calibration E.coli and S.Cerevisiae - optional
BS-010168-A10	230VAC 50/60Hz Euro plug

SPECIFICATIONS

Light source	Laser
Measurement wavelength (λ)	850 ± 15 nm
Measurement range	0-100 OD600
E.coli factory calibration measurement range	0-50 OD600
S.cerevisiae factory calibration measurement range	0-75 OD600
Achievable user calibration measurement error (range 0.1-6 OD600)	± 0.3
Achievable user calibration measurement error (range 6-50 OD600)	≤ 5%
Achievable user calibration measurement error (range 50-75 OD600)	≤ 10%
Measurement periodicity per hour	1-60
Temperature setting range	+4°C ... +60°C
Temperature control range	+15 °C below ambient ... +60 °C
Temperature stability	±0.3 °C
Sample temperature accuracy (20°C – 37°C)	±1 °C
Tube sockets	8
Sample working volume range	3–50 ml
Speed control range	150–2700 rpm
Reverse spin time setting range 150-250 rpm	0 s
Reverse spin time setting range 250–300 rpm	2-60 s
Reverse spin time setting range 300–2700 rpm	0-60 s
Display	LCD
Minimum PC requirements	Intel/AMD Processor, 1 GB RAM, Windows Vista/7/8/8.1/10/11, USB 2.0 port
Overall dimensions (W×D×H)	350 x 690 x 300 mm
Weight	20 kg
Nominal operating voltage	AC 230 V, 50 Hz
Power consumption	3.15 A / 500 W

ACCESSORIES

USB 2.0 Hub 10 × ports
BS-010158-BK

TubeSpin® Bioreactor 50 - 20
BS-010158-AK

50 ml tubes with membrane filter TPP TubeSpin® Bioreactor 50, 20 pcs.

TubeSpin® Bioreactor 50 - 180
BS-010158-CK

50 ml tubes with membrane filter TPP TubeSpin® Bioreactor 50, 180 pcs.

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RTS-8 Plus, Personal multi-channel bioreactor with non-invasive real time OD pH and pO2 measurement

DESCRIPTION

RTS-8 plus is a personal bioreactor that utilizes 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, fluorescence and luminescence measurement systems, it is possible to register cell growth kinetics, 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 in 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 which 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.

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
- Non-invasive O_2 and pH measurement allows for accurate monitoring of metabolic activities

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, for highly parallelized measurements in disposables, and for biotechnological applications

SOFTWARE FEATURES

- Real–Time cell growth logging
- Real-Time pH and O_2 measurement and logging
- 3D graphical representation of OD or growth rate over time over unit
- Pause option
- Save/Load option
- Report option: PDF and Excel

CAT. NUMBER

	Including TPP TubeSpin® Bioreactor vessels 50ml, 20pcs and sterile TPP TubeSpin® Bioreactor vessels, 50ml, with pH and O2 sensors, 10pcs
	Calibration E.coli
BS-010170-A01	230VAC 50Hz Euro plug
BS-010170-A04	230VAC 50Hz UK plug
BS-010170-A03	120VAC 50/60Hz US plug
BS-010170-A05	230VAC 50/60Hz AU plug
	Calibration S.Cerevisiae - optional
BS-010170-A08	230VAC 50/60Hz Euro plug
BS-010170-A09	230VAC 50/60Hz UK plug
BS-010170-A06	120VAC 50/60Hz US plug
BS-010170-A07	230VAC 50/60Hz AU plug
	Calibration E.coli and S.Cerevisiae - optional
BS-010170-A11	230VAC 50/60Hz Euro plug

- Remote monitoring option (requires internet connection)
- Cycling/Profiling options
- User manual calibration possibility for most cells

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

To fully use RTS-8 plus capabilities, the device must be connected to a PC and RTS-8 plus software. The device cannot be used as a standalone unit.

SPECIFICATIONS

Light source	Laser
Measurement wavelength (λ)	850 ± 15 nm
Measurement range	0-100 OD600
E.coli factory calibration measurement range	0-50 OD600
S.cerevisiae factory calibration measurement range	0-75 OD600
Achievable user calibration measurement error (range 0.1-6 OD600)	± 0.3
Achievable user calibration measurement error (range 6-50 OD600)	≤ 5%
Achievable user calibration measurement error (range 50-75 OD600)	≤ 10%
Measurement periodicity per hour	1-60
Temperature setting range	+4°C ... +60°C
Temperature control range	+15 °C below ambient ... +60 °C
Temperature stability	±0.3 °C
Sample temperature accuracy (20°C – 37°C)	±1 °C
Tube sockets	8
Sample working volume range	3–50 ml
Speed control range	150–2700 rpm
Reverse spin time setting range 150-250 rpm	0 s
Reverse spin time setting range 250–300 rpm	2-60 s
Reverse spin time setting range 300–2700 rpm	0-60 s
Display	LCD
Minimum PC requirements	Intel/AMD Processor, 1 GB RAM, Windows Vista/7/8/8.1/10/11, USB 2.0 port
Overall dimensions (W×D×H)	350 x 690 x 300 mm
Weight	20 kg
Nominal operating voltage	AC 230 V, 50 Hz

Power consumption	3.15 A / 500 W
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02 sensor	+
Range	0-100%
Accuracy	±0.05% O2 at 0.2%, ±0.4% O2 at 20.9%
Drift	<0.03% O2 within 30 days
Temperature range	up to 40°C
Response time (t90)	<6 s
Storage stability	18 months
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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

ACCESSORIES

USB 2.0 Hub 10 × ports
BS-010158-BK

TubeSpin® Bioreactor 50 - 20
BS-010158-AK

50 ml tubes with membrane filter TPP TubeSpin® Bioreactor 50, 20 pcs.

TubeSpin® Bioreactor 50 - 180
BS-010158-CK

50 ml tubes with membrane filter TPP TubeSpin® Bioreactor 50, 180 pcs.

TubeSpin® Bioreactor 50ml with pH and O2 sensors
BS-010170-AK

Sterile TPP TubeSpin® Bioreactor vessel, 50 ml, with pH and O2 sensor spots, 1 pce.