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Multi Channel Bioreactor RTS-8 PLUS

With Non-Invasive Real-Time OD pH and pO_2 Measurement

Description

RTS-8 PLUS uses the patented ReverseSpin® technology. This is an innovative and energy-saving mixing technique that leads to highly efficient mixing and oxygen supply for aerobic cultivation. By rotating the Falcontubes around their own axis and changing the direction of rotation, the cell suspension is optimally mixed.

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 value 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.

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.

Mehrkanal Bioreaktor RTS-8 Plus

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

- Real-Time cell growth logging
- Real-Time pH and O2 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
- Remote monitoring option (requires internet connection)
- Cycling/Profiling options
- User manual calibration possibility for most cells

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General Technical Data

Order No.	103.4060
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	+15°C bis +60°C
Temperature control range	15°C below ambient up to +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 sec
Reverse spin time setting range 250–300 rpm	2 – 60 sec
Reverse spin time setting range 300–2700 rpm	0 – 60 sec
Display	LCD
Minimum PC requirements	Intel/AMD Processor, 1 GB RAM, Windows Vista/7/8/8.1/10/11, USB 2.0 port
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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Specifications

- The parallel cultivation of eight tubes makes it possible 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

Technical Data 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 sec
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 sec
Storage stability	18 months

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