DASGIP Parallel Bioreactor Systems

Unparalleled Results in Microbial Application

Systems Microbiology

Technology

Using DASGIP Parallel Bioreactor Systems scientists benefit from an advanced bioreactor technology gaining superior results in strain characterization, process development and gene expression.

DASGIP systems combine the conveniences of simple systems such as shaking flasks with benefits of large-scale bioreactors: Small working volumes allow high experimental throughput with minimal input. Precision and comprehensive process control result in highly scalable and reproducible output. Users working with *E. coli*, *Pichia pastoris*, yeast and fungi have experienced the DASGIP system as customized and highly efficient biological processing tool.

Components

DASGIP Parallel Bioreactor Systems consist of tried and true components, each one designed to fit into the modular DASGIP system and adaptable to 3rd party systems, too. DASGIP's fermentations systems can easily be adjusted to meet microbiology requirements.

■ Process Control

The integrated control software allows easy operation and real parallelization of work flows, no matter if serving 4, 8 or 16 vessels within one set-up. Vital parameters are monitored and controlled by preset values, profiles or by triggered automation. A comprehensive documentation utilizes all data for further processes. Special software packages cover individual requirements such as in-depth metabolic studies.

■ Temperature and Agitation Control

Temperature and agitation in up to 4 vessels can be controlled independently from another with one module. Combined with magnetic stirring, overhead drives, heating blankets or the Bioblock, this module features various ways to control these parameters.

■ pH, DO and Level Control

DASGIP control modules monitor pH, DO and level. This provides reliable data for precise gas supply, anti foam control and triggered feed.

■ Substrate Feed

The Multi Pump Modules MP4 and MP8 not only satisfy continuous nutrient addition to fast growing cells, but also allow the optimization of pH control on 4 or 8 channels per module. Batch and fed-batch operation are available.

■ Aeration and Gas Supply

With the gas mixing systems up to 4 vessels can be provided with an individual mixture of air, nitrogen, oxygen and carbon dioxide via one module. Mass flow controllers for each gas outlet are available as well as simple rotameter gassing. The MF4 controls 4 separate mass flow controlled gas leads for 4 freely selectable gasses.

■ Off-Gas Analyzer

The DASGIP Off-Gas Analyzer is an oxygen and carbon dioxide analyzer providing mass flow controlled data of 4 independent gas flows without needing a multiplexer. With the oxygen uptake rate, carbon dioxide evolution rate and the respiratory quotient calculated in real-time, the off-gas analyzer gives deep insight into the cells' metabolic activities.

■ Vessels

Fermentation vessels at scales from 60 mL to 4 L working volume give users the bioreactor at hand they need. Simple stirred vessels are available and so are fully instrumented bioreactors. DASGIP vessels are autoclavable and can be operated with headspace and submerged gassing.

Quality System certified by DQS ■ DIN EN ISO 9001 ■ Reg.-No. 63431

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Components	Specifications
DASGIP Control	
■ Parallel set-up and control of 4, 8 or 16 vessels ■ Triggering Automation Package (optional) ■ Metabolic Activity Package (optional) 	■ Microsoft Windows XP Pro or Vista ■ USB Pen Drive (1 GB), network interface and uninterruptible power supply included ■ Electrical supply: 115 or 230VAC, 50 - 60Hz
Temperature and Agitation Module TC4SC4*	
■ Individual and independent temperature and agitation control of 4 vessels. ■ Drives: Magnetic stirring plates or overhead drive ■ Temperature: Conventional heating blankets, pads as well as cooling valves 	■ Supports 4 heating and cooling outputs ■ Heating power per output: 250 W (115 - 230 VAC, 50/60 Hz) ■ Permissible load on cooling output: 10 W (115 - 230 VAC, 50/60 Hz) ■ Supports 4 stirring points ■ Ranges: 2 - 250 [C], 60 - 1200 [B/F], 100 - 1600 rpm [D]
DASGIP Sensor Module PH4PO4 & PH8PO8*	
■ Monitoring of pH and pO2 incl. simultaneous calibration and level control on 4 (PH4PO4) or 8 channels (PH8PO8) ■ Additional level/anti foam control redox analysis 	■ Supports standard pH- and DO-sensors ■ Temperature measurement: - Pt100 hand-held (max. 2 inputs) - NTC integrated in DO sensors ■ Automated temperature compensation ■ Optional: level detection / foam sensor
Gas Mixing Station MX4/4 and MX4/1*	
■ 4 independently operated outputs ■ Thermal mass flow controlled individual mixture of Air, N_2, O_2 and CO_2 	■ Gas flow rates (min. - max.): **MX4/4** 0; 0.5 to 250 sL/h [H] or 0; 0.1 to 50 sL/h **MX4/1** 0; 0.5 to 20 sL/min
Multipump Modules MP4 and MP8*	
■ 4 or 8 independently operated peristaltic pumps with variable speed drives ■ Continuous delivery or dispense mode ■ Operation in dispense mode at flow rates below minimum (MP4: 0.01 L/h, MP8: 0.3 mL/h) 	■ Tube ID ref. to Media flow rates (min.-max.) **MP4**: 0.5 mm (0.01 to 0.07 L/h) 0.8 mm (0.02 to 0.22 L/h) 1.6 mm (0.06 to 0.74 L/h) 2.4 mm (0.13 to 1.57 L/h) 3.2 mm (0.23 to 2.72 L/h) 4.8 mm (0.43 to 5.04 L/h) **MP8**: 0,25 mm (0.3-9.5 mL/h) 0.5 mm (1.3 to 42 mL/h) 2 mm (13 to 420 mL/h) 1 mm (4 to 122 mL/h)
Off-Gas Analyzer GA4*	
■ Continuous monitoring and analyzing of O_2 and CO_2 off gas concentration in up to 4 bioreactors ■ Real-time calculation of oxygen uptake rate, carbon dioxide evolution rate and respiratory quotient 	■ Mass flow sensors' type and range: Carbon Dioxide: IR, 0 - 25 % (others available) Oxygen: ZrO_2, 1 - 50 % (others available)
DASGIP Bioblock	
■ 4 temperature-controlled positions for heating and cooling ■ Integrated magnetic stirring plates for agitation ■ Suitable for DASGIP TC4SC4B 	■ Temperature range: 10 K above ambient to 60°C 10 K above cooling agent to 60°C with external chiller
DASGIP Bioblock Stirrer	
■ 316L stainless steel head plate (5 PG13.5 and 4 6mm ports) ■ Aeration: Headspace and/or submerse Gassing ■ Agitation: Magnetic driven stir bar or Pitched Blade Impeller 	■ Working volumes: 60-200 mL, 150-300 mL ■ Suitable for DASGIP Bioblock
DASGIP Bioblock Advanced Stirrer Line SR	
■ 316 L stainless steel head plate (7 PG13.5 and 1 6mm port) ■ Aeration: Headspace and/or submerse Gassing ■ Agitation: Overhead-driven Rushton Impeller 	■ Working volumes: 200-1000 mL, 200/500-1500 mL, 400-2000 mL ■ Suitable for DASGIP Bioblock
DASGIP Benchtop Bioreactor Line DR	
■ 316 L stainless steel head plate (8 M18x1.5mm and 8 6mm ports) ■ Aeration: Headspace and/or submerse Gassing ■ Agitation: Overhead-driven Rushton Impeller 	■ Working volumes: 0.7-2.7 L and 0.8-3.8 L ■ Aeration: Headspace or submerged gassing ■ Not suitable for DASGIP Bioblock

* Up to 3 modules stackable

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