

Multipump Module MP4

4-fold Parallel Fluid Transfer

Technology

The Multipump Module MP4 provides 4 controlled high-precision pumps for multiple fluid transfer while occupying little lab space.

■ Parallel and Highly Precise

The speed of each peristaltic pump is controlled electronically and can be adjusted individually. Both speed and flow set points are exactly maintained.

■ Flow Rates Between 0 and 5 L/h

Several operation modes and variable tube types, allow flow rates between 0 and 5 L/h. The in built calibration ensures reproducible results. Continuous operation with preset or triggered flow rates is available from 0.01 to 5 L/h. Lower flow rates can be operated in dispense mode with a preset volume and freely selectable flow rate.

■ DASGIP Control: Powerful PC Software

Multi-Pump Modules MP4 are tried and tested components of the DASGIP Cultivation Systems fedbatch-pro® and cellferm-pro® for microbiology and cell culture. Up to 16 vessels can be operated in parallel with DASGIP Control.

For stand alone application the MP4 Module has its own microprocessor. One or more modules can be operated with a PC using the DASGIP EasyAccess Software, delivered with eIP Module.

Digital and analog* interface allow perfect integration into the professional lab.



Module MP4

Applications

The MP4 Module has been developed for applications in research and development focusing on lab and pilot scales. Larger peristaltic pumps and larger tube diameters compared to DASGIP's micropump module MP8, expand application of the parallel bioreactor systems to working volumes of about 50 L in cell culture.

■ Microbiology and Cell Culture

The parallel design makes the MP4 Module perfect for all applications where several liquid media have to be dispensed with high precision at low flow rates up to 5 L/h. May it be high cell density fermentation up to 2 L or cell expansion up to 50 L: substrate limitations can be almost excluded.

Not only feed of fast growing cells and microorganisms but also perfusion and pH control can be optimized with the MP4.

■ Laboratory, Production, Quality Assurance

Whether the MP4 Module is used in laboratories, in production or as part of quality assurance - it easily exceeds highest demands. DASGIP supports and meets the requirements for products and processes as part of the PAT.

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

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Benefits

“By making our system suitable for volumes, which are required within the pilot scale quite often, we want to economize up-scaling processes”, says Dr. Matthias Arnold, CSO DASGIP. The following features contribute:

■ **Highest Precision on Minimal Lab Space**

Peristaltic pumps provide highest precision on 4 channels for each of 4 vessels. Continuous flow down to 0.01 L makes sure cells and microorganisms receive exactly what they need, at any time. This leads to good scalability and reproducible results. The parallel, modular design requires only a minimum of lab space. Up to three modules can be stacked to save even more precious space.

■ **Graphical Display and Logging of All Data**

The built-in microprocessor and the serial interface allow straightforward PC* support. With the included software all pumps can be calibrated individually and all read out data will be displayed graphically and numerically. Operation as single module as well as integration into third-party systems is possible.

All data can be continually logged on the PC*. The saved data is immediately accessible for evaluation using e.g. Microsoft Excel®. This allows the comparison of parameters such as volumes, flow rates or substrates themselves. Users gain higher productivity. Data are also available for quality assurance and comprehensive documentation.

■ **Software Integration, Process Automation**

Being part of the DASGIP cultivation systems integration into any DASGIP system not older than 3 years is guaranteed. The latest process control software DASGIP Control 3.0 provides a concise depiction of all or single reactors, intuitive handling and added automation features.

The included ActiveX®/COM® and .Net® programming libraries support all established programming languages. Furthermore, Labview®, the leading product of the lab automatization, is supported.

Technical Data

MODULE

Dimensions (WxDxH)	300 x 320 x 190 mm
Ambient Conditions	5°C to 40°C; max. 80% rH; do not use outdoors
Max. Altitude	2000 m over NN
Electrical Supply	115 to 230 V, 50/60 Hz, max. 120 VA
Power Supply	60 VA
Weight	Approx. 10 kg
Interface	RS232 / RS485; analog interface: 0-10 V*

*The PC and the analog interface are not part of the delivery

PUMPS

Count	4
Type	Pump with 2 wheels, spring loaded tube bed
Drive	Speed controlled with planetary gear
Operating Modes	Continuous / Dispense
Features	Autom. Switch to dispense mode when speed is lower than min. continuous flow rate

TUBES

Material	Bioprene®, Pharmed®, Marprene®, Silicone
Wall Thickness	1.6 mm
Inner Diameter	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)