

The Micropump – A New Heartbeat in Microfluidics

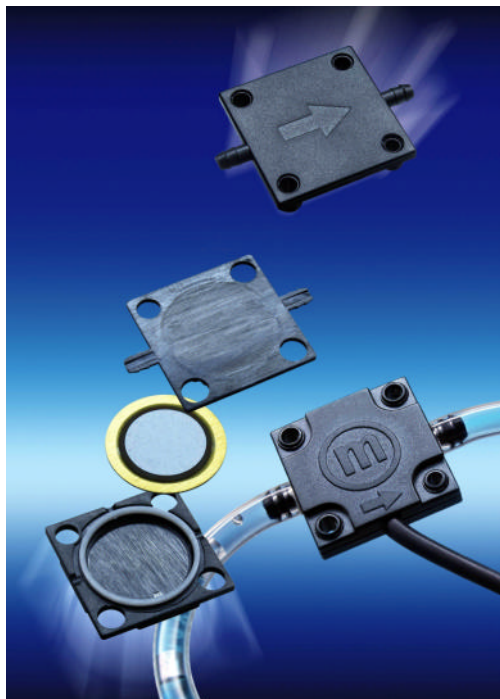
Starting from „classic“ microsystems technology, micropumps are mainly produced on silicon basis. By that the precise transport of fluids was quite dear till now. Because the natural crystallization levels of silicon permitting only certain geometries that always lead to a complex multilayer design.

With the new serial produced micropump of Bartels Mikrotechnik the pumping of microscopic volumes becomes more flexible and lower in price now. The pump is made of injection-moulded plastic and can therefore easily fabricated in serial production. Just as big as a cent coin the easy designed mini-pump can cope with most particles in fluids. And the low price allows its using as disposable.



Small, smart and low in price: the new micropump from Bartels.

For much more simple and flexible use of the micropump Bartels Mikrotechnik offers now in addition to the manual "basic"- and "extended"-pump-control a new control device. It gives users the opportunity to configure the pump rate comfortably by a small USB-Stick on PC. These systems can be ordered as starter kits for testing purpose. Please contact us for further details.



Smart and reliable: Due to its easy design the micropump copes with most particles in fluids.

Advantages

The complete micropump is made of plastic (polyphenyl sulphone/polyimide) except to the active element. The so called actuator consists of a piezoceramic sticking on a plastic membrane. The membrane itself covers a small pump chamber that is fed by two double valves controlling the flow. This easy design makes the pump highly reliable and robust towards particles in fluids. Further advantages are:

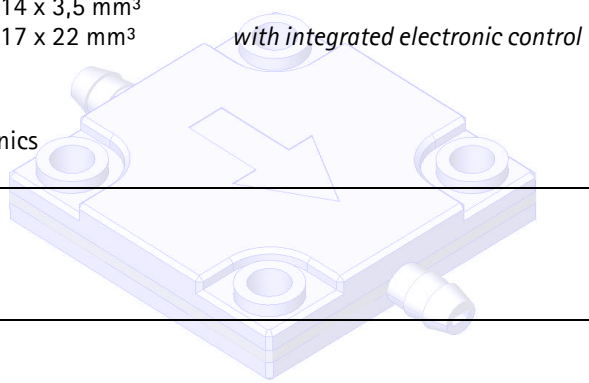
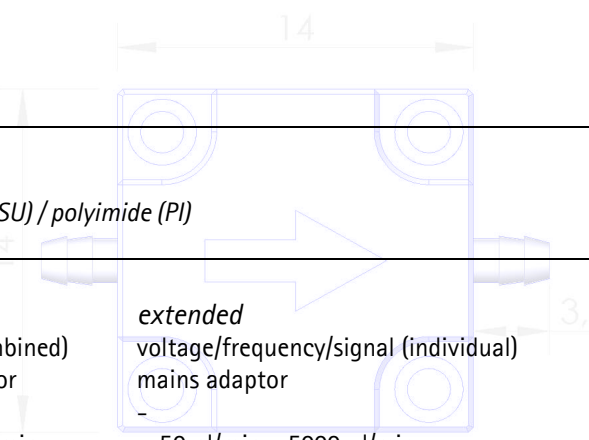
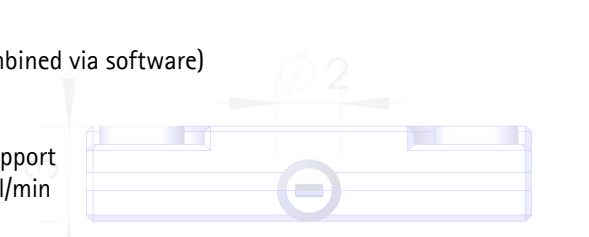
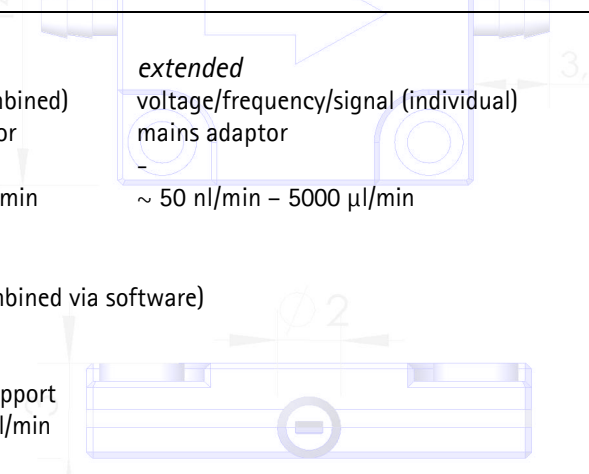
- high variability of performance characteristics by small changes in design,
- comfortable modulation of the pump rate (also via PC/USB now),
- easy integration in fluidic systems,
- standardized fittings for easy connection to the macro world,
- serial production by micro injection moulding or hot embossing techniques.

Applications

Typical micro fluidic applications like:

- medical technology, pharmacology,
- chemical analytics,
- biotechnology,
- environmental engineering,
- generic engineering (cooling systems, lubrication, ventilation, gas dosing).

Technical Data of the Micropump mP 5

		mP 5	
size	mP5	14 x 14 x 3,5 mm ³	
	mP5-i	20 x 17 x 22 mm ³	
weight		0,8 g	
fluidic connections		2mm <i>outer diameter</i>	
current consumption		depends on the electronics	
pumped media		<i>gases, liquids</i>	
viscosity		< ~ 120 mPas	
particle tolerance		Ø < 50 µm	
flow range			
liquids:		50 nl/min – 5 ml/min	
gases:		50µl/min – 15 ml/min	
feed pressure			
liquids:		max. 500 mbar	
gases:		max. 60 mbar	
operating temperature		0 °C – 80 °C	
durability		> 7000 h	
materials (in contact with media)		<i>polyphenyl sulphon (PPSU) / polyimide (PI)</i>	
control devices			
manual			
control	<i>basic</i>	<i>extended</i>	
power supply	voltage/frequency (combined)	voltage/frequency/signal (individual)	
current consumption	battery or mains adaptor	mains adaptor	
flow range	ca. 30mA	-	
	~ 50 µl/min – 3000 µl/min	~ 50 nl/min – 5000 µl/min	
PC-supported			
control	<i>USB-Stick</i>		
power supply	voltage/frequency (combined via software)		
current consumption	USB-interface		
software (incl.)	-		
flow range	open source / online support		
	~ 150 µl/min – 3000 µl/min		

custom-built designs on request

Last update: June 2005

Patent pending