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DE → Seite 14

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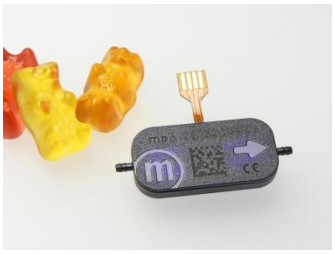


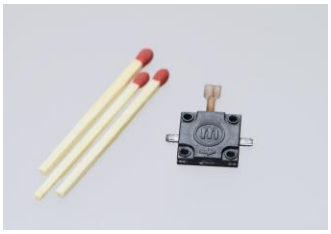
mp6 – double actuator micropump

Bartels Micropumps

Micropumps transporting the tiniest amounts of gases or liquids can be considered the heart of microfluidics.

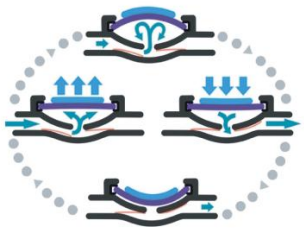
In many sectors they have become indispensable. Dosing lubricants, feeding sensors with sample gas or mixing starch into the steam of flat irons are only a few of the manifold tasks they can fulfill. Many further fields of application for example are located in medical technologies and analytics.

Extremely small in size and low in weight, with good particle tolerance and temperature resistance, Bartels micropumps are well prepared to be used in any of these sectors. As they are almost completely made of plastics, large quantities of these pumps can be produced at low cost and so may well be used as disposables.



mp5 – smallest available plastic micropump

The functional principle of the Bartels micropumps is based on a piezoelectric diaphragm in combination with passive check valves. A piezo ceramic mounted on a coated brass membrane is deformed when voltage is applied. By the resulting down stroke, the medium is being displaced out of the pump chamber below. The check valves on both sides of the pump chamber define the flow direction. When the voltage decreases, the corresponding piezo deformation causes an upstroke of the membrane. The medium is sucked in and the chamber is filled again. In every second, the pump can do several hundreds of such pumping cycles. The pumping performance can be influenced by adjustment of the parameters.



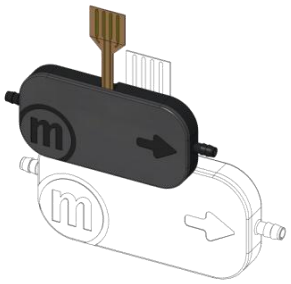
Functional principle.

Important advantages for all users result from the radically simple pump design: Injection molded parts for housing and pump chamber, piezo actuators and passive valves constitute the key components. Thus any adaptation to specific requirements concerning flow rate or back pressure is easy to realize. This customization of micropumps with the appropriate electronic controllers is part of the services offered by Bartels

microComponents. If requested, the pumps can be fully integrated into complex system designs as well.

Once the perfect pump for your application has been found, you may purchase an exclusive production license for this version to include the component into your own production processes. Of course Bartels microComponents can also realize a high quality serial production for you at low cost.

mp6 Micropump

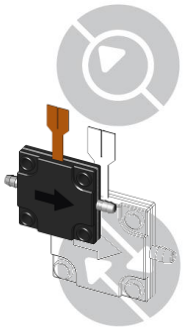


The Bartels micropump mp6 combines two piezo actuators inside a single housing. The new pump joins the established functional principle and central advantages of its parent generation mp5 with its **own specific innovative features.**

The small power pack can handle **twice the back pressure** the mp5 can cope with, has an **increased priming capability** and is of **higher bubble tolerance**, so that even gas-liquid-mixtures can be pumped without problems. Its **low power consumption** is a further advantage. In the entire pump only one material gets into contact with the medium. Now two types of materials are available. In the standard mp6 all relevant parts are made of polyphenylsulfone (PPSU) and in the mp6-pp of polypropylene (PP).

The mp6 can already be offered at low prices for large quantities due to an automated assembly. The mp6-pp is produced less automated but for larger quantities it can also be transferred into serial production.

mp5 Micropump



The mp5 from Bartels microComponents is the smallest and lightest micropump available. Since 2004 the mp5 has successfully shown the potential of piezo membrane pumps. Due to the limited bubble tolerance and higher price in medium quantities, it is now replaced by its successor the mp6 in many applications. If size is a challenging factor, then the mp5 is still the right choice.

Its low power consumption and tiny size makes the mp5 the perfect pump to be fully integrated into your product's design. Test the mp5 now and ask

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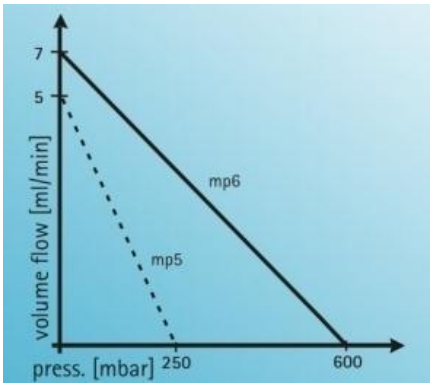
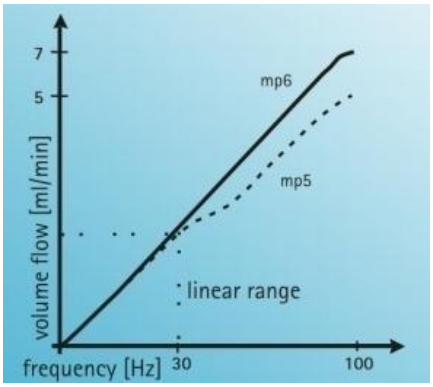
about the possibilities of a customer specific adaptation - for your individual micropump.

Typical characteristics of the Bartels micropumps:

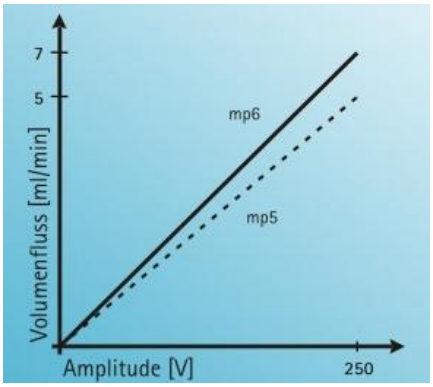
volume flow versus pressure



volume flow versus frequency



volume flow versus amplitude



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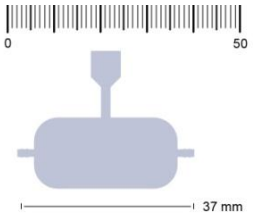
Technical Data of the mp6[1]

mp6	Order code: mp6
Pump type	piezoelectric diaphragm pump
Number of actuators	2
Dimensions without connectors	30 x 15 x 3.8 mm 1.1811 x 0.5906 x 0.1498 in.
Weight	2 g
Fluidic connectors	barbed tube clip, (outer diameter 1.9 mm, length 3.5 mm) [2]
Electric connector	flex connector 1.25 mm pitch
Power consumption	< 200 mW
Self-priming	yes [3]
Pumping media	liquids, mixtures
Operating temperature	0–70°C
Life time	5000 h [4]
IP code	IP33 [5]
Material in contact with media	polyphenylsulfone (PPSU) [6]
Suitable evaluation controller	mp-x, mp6-EVA and mp6-OEM
Typical values of flow and back pressure for selected media (values defined with mp-x: 250 V, SRS):	
Liquids – water	
max. volume flow	7 ml/min +/- 15% (5.95 ml/min – 8.05 ml/min) [4]
max. back pressure	600 mbar +/- 15% (510 - 690 mbar) [4]



[1] Typical values. Values can vary under application conditions. Content is subject to changes without notice.
[2] Recommended tubing: 1.3 mm inner diameter.
[3] Conditions: Suction pressure < 10 mbar, DI water, settings mp-x: 100 Hz, 250 V, SRS, the max. volume flow will be reached after a few minutes of operation time.
[4] Conditions: DI water, room temperature, settings mp-x: 100 Hz, 250 V, SRS
[5] Can be changed to IP44.
[6] The mp6 is not stable against concentrated alcoholic solutions as MeOH or EtOH.

Please find more information concerning the controller and the equipment in the corresponding data sheets.

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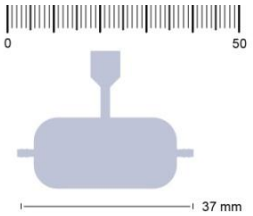
Technical Data of the mp6-AIR[1]



mp6-AIR	Order code: mp6-AIR
Pump type	piezoelectric diaphragm pump
Number of actuators	2
Dimensions without connectors	30 x 15 x 3.8 mm 1.1811 x 0.5906 x 0.1498 in.
Weight	2 g
Fluidic connectors	barbed tube clip, (outer diameter 1.9 mm, length 3.5 mm) [2]
Electric connector	flex connector 1.25 mm pitch
Power consumption	< 200 mW
Self-priming	yes [3]
Pumping media	gases
Operating temperature	0 – 70°C
Life time	t.b.d.
IP code	IP 33 [4]
Material in contact with media	polyphenylene sulphone (PPSU) [5]
Suitable evaluation controller	mp-x, mp6-EVA and mp6-OEM
Typical values of flow and back pressure for selected media (values defined with mp-x: 250 V, SRS):	
Gases	
typ. max. volume flow	18 ml/min (300 Hz) [6]
typ. max. back pressure	100 mbar (300 Hz) [6]

[1] Typical values. Values can vary under application conditions. Content is subject to changes without notice.
[2] Recommended tubing: 1.3 mm inner diameter.
[3] Conditions: Gases, room temperature, settings mp-x: 300 Hz, 250 V, SRS, the max. volume flow will be reached after a few minutes of operation time.
[4] Can be changed to IP44.
[5] The mp6 is not stable against concentrated alcoholic solutions as MeOH or EtOH.
[6] Conditions: Gases, room temperature, mp-x: 300 Hz, 250 V, SRS

The mp6-AIR is a regular mp6 that was specifically measured for gas flow.

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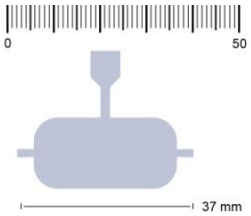
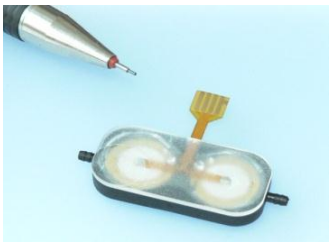
Technical Data of the mp6-pp[1]





mp6-pp	Order code: mp6-pp
Pump type	piezoelectric diaphragm pump
Number of actuators	2
Dimensions without connectors	30 x 15 x 3.8 mm 1.1811 x 0.5906 x 0.1498 in.
Weight	2 g
Fluidic connectors	barbed tube clip, (outer diameter MIN 1.77 mm - MAX 1.85 mm, length 3.5 mm) [2]
Electric connector	flex connector 1.25 mm pitch
Power consumption	< 200 mW
Self-priming	yes [3]
Pumping media	liquids, gases and mixtures
Operating temperature	t.b.d.
Life time	t.b.d.
IP code	IP 33 [4]
Material in contact with media	polypropylene (PP) [6]
Suitable evaluation controller	mp-x, mp6-EVA and mp6-OEM
Typical values of flow and back pressure for selected media (values defined with mp-x: 250 V, SRS):	
Gases	
max. volume flow	14 ml/min +/- 15% (11.9 – 16.1 ml/min) [5]
max. back pressure	150 mbar +/- 15% (127.5 – 172.5 mbar) [5]
Liquids – water	
max. volume flow	5 ml/min +/- 15% (4.25 – 5.75 ml/min) [6]
max. back pressure	650 mbar +/- 15% (552.5 mbar – 747.5 mbar) [6]
Liquids - MeOH	
max. volume flow	6.8 ml/min [7]
max. back pressure	550 mbar [7]

[1] Typical values. Values can vary under application conditions. Content is subject to changes without notice.
[2] Recommended tubing: 1.02 mm inner diameter. MIN & MAX values due to injection molding shrink.
[3] Conditions: Suction pressure < 10 mbar, DI water, settings mp-x: 100 Hz, 250 V, SRS, the max. volume flow will be reached after a few minutes of operation time.
[4] Kann auf IP44 angepasst werden.
[5] Conditions: Gases, room temperature, mp-x: 300 Hz, 250 V, SRS
[6] Conditions: DI water, room temperature, settings mp-x: 100 Hz, 250 V, SRS
[7] Conditions: DI water, room temperature, settings mp-x: 100 Hz, 250 V, SRS

Please find more information concerning the controller and the equipment in the corresponding data sheets.

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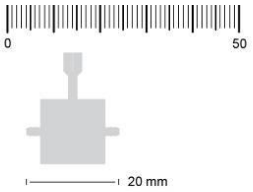
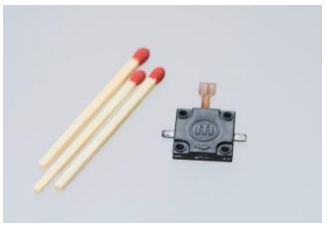
Technical Data of the mp5[1]



mp5	Order code: mp5
Pump type	piezoelectric diaphragm pump
Number of actuators	1
Dimensions without connectors	14 x 14 x 3.5 mm 0.5512 x 0.5512 x 0.1378 in.
Weight	0.8 g
Fluidic connectors	barbed tube clip, (outer diameter 2 mm, length 3 mm) [2]
Electric connector	flex connector / phone jack
Power consumption	< 200 mW
Self-priming	yes [3]
Pumping media	liquids or gases
Operating temperature	0 – 70°C
Life time	5000 h [4]
IP code	IP44
Material in contact with media	polyphenylsulfone (PPSU), polyimide (PI), nitrile butadiene rubber (NBR) [5]
Suitable evaluation controller	mp-x, mp6-EVA and mp6-OEM
Typical values of flow and back pressure for selected media (values defined with mp-x: 250 V, SRS):	
Gases	
max. volume flow	15 ml/min (300 Hz) [6]
max. back pressure	30 mbar (300 Hz) [6]
Liquids – water	
max. volume flow	5 ml/min (100 Hz) [4]
max. back pressure	250 mbar (100 Hz) [4]



[1] Typical values. Values can vary under application conditions. Content is subject to changes without notice.
[2] Recommended tubing: 1.3 mm inner diameter.
[3] Conditions: Suction pressure < 10 mbar, DI water, settings mp-x: 100 Hz, 250 V, SRS, the max. volume flow will be reached after a few minutes of operation time.
[4] Conditions: DI water, room temperature, settings mp-x: 100 Hz, 250 V, SRS
[5] The mp6 is not stable against concentrated alcoholic solutions as MeOH or EtOH.
[6] Conditions: Gases, room temperature, mp-x: 300 Hz, 250 V, SRS

Please find more information concerning the controller and the equipment in the corresponding data sheets.

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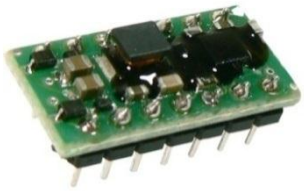
Accessories for the Bartels Micropumps

mp-x controller	Order code: mp-x
Access to the full range of driving parameters. A system for the professional evaluation of the micropumps.	
Dimensions	7.5 x 16 x 20 cm 2.983 x 6.299 x 7.874 in.
Weight	ca. 800 g
Pumping media	liquids, gases
Max. volume flow	mp6: 7 ml/min (SRS, 250 V, 100 Hz), DI-water mp6-AIR: 18 ml/min (SRS, 250 V, 300 Hz), air mp6-pp: 5 ml/min (SRS, 250 V, 100 Hz), DI-water mp5: 5 ml/min (SRS, 250 V, 100 Hz), DI-water
Adjustable parameters	amplitude, frequency, signal form
Amplitude range	0 – 250 V
Frequency range	0 - 300 Hz
Signal form	SRS, rectangular, sine
Power supply	mains adaptor
Current consumption	750 mA at 7.5 V
USB-Port incl. driver	one; a CD with driver software is included
connectable micropumps	mp5: 1x-2x or mp6, mp6-AIR and respectively mp6-pp: 1x

mp-x

mp6-OEM controller	Order code: mp6-OEM
The OEM-controller drives the micropump at adjustable performance in a package similar to an integrated circuit. It enables integration into system electronics or on a PCB.	
Dimensions	10.5 x 20.5 x 6 mm 0.4134 x 0.8070 x 0.2362 in.
Pumping media	liquids, gases
Max. volume flow (DI-water)	4.9 ml/min @ 3 VDC supply; 100 Hz 7 ml/min @ 5 VDC supply; 100 Hz
Adjustable parameters	amplitude, frequency
Amplitude range	85 – 270 Vpp [1]
Frequency range	25 - 226 Hz (Frequencies up to 1000 Hz are possible; please note that the amplitude will decrease in that case. Frequencies down to 1 Hz are possible with an external clock generator.)
Signal form	similar to rectangular
Power supply	2.5 – 5.5 VDC (5 V recommended for optimized performance)
Current consumption	ca. 30 mA at 5 V
Pin arrangement	DIL 14; horizontal ~2.54 mm, vertical ~7.62 mm
[1] Before May 2014: mp6-OEM have an amplitude range of 85 – 235 Vpp	



mp6-OEM

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mp6-EVA evaluation board	Order code: mp6-EVA
The evaluation board enables the simple use of the micropump based on the mp6-OEM controller. Next to preset standard parameter (235 Vpp, 100 Hz) the mp6-EVA also allows adjusting the pump parameters flexibly, this partly by external tuning. As the supply voltage of the module can be provided via USB (no data interface), just attach it to a USB power supply and start the evaluation. Alternatively it can also be supplied by a 2.5 – 5 V voltage source.	
Dimensions	6.5 x 3 x 2 cm 2.5590 x 1.1811 x 0.7874 in.
Pumping media	liquids, gases
Max. volume flow (mp6, DI-Water)	4.9 ml/min @ 3 VDC supply; 100 Hz 7 ml/min @ 5 VDC supply; 100 Hz
Adjustable parameters	Amplitude, frequency
Amplitude range	85 – 270 Vpp [1]
Frequency range	25 - 226 Hz (Frequencies up to 1000 Hz are possible; please note that the amplitude will decrease in that case. Frequencies down to 1 Hz are possible with an external clock generator.)
Signal form	similar to rectangular
Power supply	via USB or 2.5 V – 5.5 VDC
Current consumption	ca. 30 mA at 5 V
[1] Before May 2014: mp6-EVA have an amplitude range of 85 – 235 Vpp	

mp6-EVA

mp6-QuadEVA evaluation board	Order code: mp6-QuadEVA
The mp6-QuadEVA is an evaluation board that allows controlling up to four mp6 micropumps simultaneously with one setting and up to a frequency of 800 Hz. It is possible to change pump voltage and pump frequency directly with the rotary control elements at the board or via USB. Simple control software is provided with the board. Also any terminal software can be used to remotely control frequency and amplitude or enable/disable each of the four pumps.	
Dimensions	80 x 60 x 16 mm 3.15 x 2.36 x 0.63 in.
Pumping media	liquids, gases
Max. volume flow (mp6-AIR, gas: air)	each single mp6-AIR: ~42 ml/min @ 260 V; 800 Hz
Adjustable parameters	amplitude, frequency
Amplitude range	0 – 260 Vpp
Frequency range	50 – 800 Hz
Signal form	sine
Power supply	7.5 V, 1000 mA
Current consumption	avg. 220 mA, peak 280 mA[1]
[1] four connected mp6-AIR @ 260 V and 800 Hz	

mp6-QuadEVA

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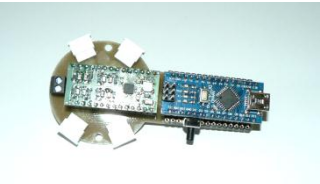
mp6-QuadOEM **pump driver for four pumps**	**Order code: mp6-QuadOEM**
The mp6-QuadOEM is a pump driver that allows driving up to four mp6 micropumps simultaneously. It comes in a package similar to an integrated circuit that enables integration into system electronics or on a PCB. The driving frequency, amplitude and also the driving signal is adjustable. Sine signal and rectangle are available amongst others. Every pump can be activated and deactivated individually. This driver is configured and controlled through an I²C interface.	
Dimensions	38 x 18 x 12 mm 1.50 x 0.71 x 0.47 in.
Pumping media	liquids, gases
Max. volume flow (mp6-AIR, gas: air)	each single mp6-AIR: ~42 ml/min @ 260 V; 800 Hz
Adjustable parameters	amplitude, frequency, signal shape
Amplitude range	0 – 260 Vpp
Frequency range	50 – 800 Hz
Signal form	sine, rectangular, other
Interface	I²C
Power supply	2.7 – 5.5 VDC (5 V recommended for optimized performance)
Current consumption	avg. 220 mA, peak 280 mA[1]
Pin arrangement	DIL28; horizontal 2.54 mm, vertical 15.24 mm
[1] four connected mp6-AIR @ 260 V and 800 Hz	

mp6-QuadOEM

mp6-QuadKEY **evaluation board for Arduino**	**Order code: mp6-QuadKEY**
The mp6-QuadKEY is an evaluation board that allows controlling the mp6-QuadOEM through an Arduino Nano or pin compatible microcontroller. Up to four mp6 micropumps can be directly connected to the board. An external power supply terminal is available, but the board can also be powered through the microcontroller USB port. All of the microcontroller port pins are exposed for easy access (to connect external hardware). The mp6-QuadKEY comes with a demo software and source code.	
Dimensions	92 x 46 x 23 mm 3.62 x 1.81 x 0.91 in.
Pumping media	liquids, gases
Max. volume flow (mp6-AIR, gas: air)	each single mp6-AIR: ~42 ml/min @ 260 V; 800 Hz
Adjustable parameters	amplitude, frequency, signal shape
Amplitude range	0 – 260 Vpp
Frequency range	50 – 800 Hz
Signal form	sine, rectangular, other
Interface	USB
Power supply	7.5 - 12V, 500 mA
Current consumption	avg. 240 mA, peak 300 mA[1]
[1] four connected mp6-AIR @ 260 V and 800 Hz	



mp6-QuadKEY

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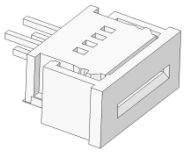
mp6-con connection cable	Order code: mp6-con
Connector for mp6/mp6-pp to mp-x	
Design and connectors	- Molex FCC 1.25 mm pitch - 85 cm (33.465 in.) cable - Binder 620 connector

mp6-con

mp6-mol connector	Order code: mp6-mol
Connector to micropump mp6/mp6-pp for custom made cabling	
Type	Molex FCC 39532045 1.25 mm pitch
packaging unit	10 pieces



mp6-mol

mp-cv check valve	Order code: mp-cv
The passive check valve eliminates the back flow of the pumping medium, when the micropump is switched off. It can be connected via tubing.	
Dimensions	21 mm x 5.5 mm (length x wrench size) 0.82677 x 0.2165 in.
Materials in contact with the pumped media	Silicone, stainless steel
Fluidic connectors	barbed tube clip, length : 5.6 mm for tubing with internal diameter: 1.3 mm
Cracking pressure	typical < 35 mbar
Max. back pressure	500 mbar
Typical leak rate	<20 µl/h for DI-water (at 500 mbar)

mp-cv

mp-t tubing	
Inlet/outlet compatible Tygon® tubing	
Inner diameter 1.3 mm suitable for: mp5, mp6 and mp6-AIR	**Order code: mp-t ID1.3**
Inner diameter 1.02 mm suitable for: mp6-pp	**Order code: mp-t ID1.02**

mp-t

mp-y tubing connector	Order code: mp-y
Y-connector for tubing, for the parallel use of two micropumps:	
Material	polypropylene (PP)
for tubing inner diameters of	1.3 – 2.6 mm 0.0512 – 0.1024 in.

mp-y

Bartels Mikrotechnik GmbH, Konrad-Adenauer-Allee 11, 44263 Dortmund, Germany
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Evaluation Sets

mp5-go! Set	Order code: mp5-go!
The evaluation of the mp5 can be started directly with this set. It contains:	
3 micropumps mp5	
1 mp-x controller	
1 meter mp-t ID1.3 tubing	

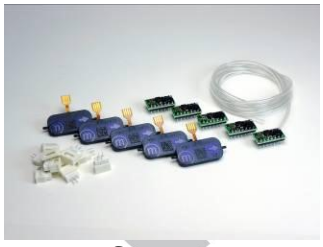
mp6-go! Set	Order code: mp6-go!
The evaluation of the mp6 can be started directly with this set. It contains:	
3 micropumps mp6	
1 mp-x controller	
1 mp6-con	
1 meter mp-t ID1.3 tubing	

mp6-go! Set

mp6-basic Set	Order code: mp6-basic
The evaluation of the mp6 can be started directly with this set. It contains:	
3 micropumps mp6	
1 mp6-EVA evaluation board	
1 meter mp-t ID1.3 tubing	

mp6-basic Set

mp6-pro Set	Order code: mp6-pro
The evaluation of the mp6 can be started directly on the customer's circuit board with this set. It contains:	
5 micropumps mp6	
5 mp6-OEM controller	
5 pieces mp6-mol	
1 meter mp-t ID1.3 tubing	



mp6-pro Set

mp6-AIR-go! Set	Order code: mp6-AIR-go!
The evaluation of the mp6-AIR can be started directly with this set. It contains:	
3 micropumps mp6-AIR	
1 mp-x controller	
1 mp6-con	
1 meter mp-t ID1.3 tubing	

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mp6-AIR-basic Set	Order code: mp6-AIR-basic
The evaluation of the mp6-AIR can be started directly with this set. It contains:	
3 micropumps mp6-AIR	
1 mp6-EVA evaluation board	
1 meter mp-t ID1.3 tubing	

mp6-AIR-pro Set	Order code: mp6-AIR-pro
The evaluation of the mp6-AIR can be started directly on the customer's circuit board with this set. It contains:	
5 micropumps mp6-AIR	
5 mp6-OEM controller	
5 pieces mp6-mol	
1 meter mp-t ID1.3 tubing	

mp6-pp-go! Set	Order code: mp6-pp-go!
The evaluation of the mp6-pp can be started with this set. It contains:	
3 micropumps mp6-pp	
1 mp-x controller	
1 mp6-con	
1 meter mp-t ID1.02 tubing	

mp6-pp-basic Set	Order code: mp6-pp-basic
The evaluation of the mp6-pp can be started directly with this set. It contains:	
3 micropumps mp6-pp	
1 mp6-EVA evaluation board	
1 meter mp-t ID1.02 tubing	

mp6-pp-pro Set	Order code: mp6-pp-pro
The evaluation of the mp6-pp can be started directly on the customer's circuit board with this set. It contains:	
5 micropumps mp6-pp	
5 mp6-OEM controller	
5 pieces mp6-mol	
1 meter mp-t ID1.02 tubing	

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mp6-QuadEVA Set	Order code: mp6-QuadEVA
The evaluation of the mp6 can be started directly with this set. It contains:	
4 micropumps mp6	
1 mp6-QuadEVA board	
1 mini-USB-cable	
1 meter mp-t ID1.3 tubing	

mp6-QuadEVA Set

mp6-AIR-QuadEVA Set	Order code: mp6-AIR-QuadEVA
The evaluation of the mp6-AIR can be started directly with this set. It contains:	
4 micropumps mp6-AIR	
1 mp6-QuadEVA board	
1 mini-USB-cable	
1 meter mp-t ID1.3 tubing	

mp6-pp-QuadEVA Set	Order code: mp6-pp-QuadEVA
The evaluation of the mp6-pp can be started directly with this set. It contains:	
4 micropumps mp6-pp	
1 mp6-QuadEVA board	
1 mini-USB-cable	
1 meter mp-t ID1.02 tubing	

mp6-QuadOEM Set	Order code: mp6-QuadOEM
The evaluation of the mp6 can be started directly with this set. It contains:	
4 micropumps mp6	
1 mp6-QuadOEM board	
4 pieces mp6-mol	
1 meter mp-t ID1.3 tubing	

mp6-QuadOEM Set

mp6-AIR-QuadOEM Set	Order code: mp6-AIR-QuadOEM
The evaluation of the mp6-AIR can be started directly with this set. It contains:	
4 micropumps mp6-AIR	
1 mp6-QuadOEM board	
4 pieces mp6-mol	
1 meter mp-t ID1.3 tubing	

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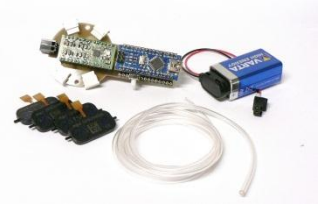
mp6-pp-QuadOEM Set	Order code: mp6-pp-QuadOEM
The evaluation of the mp6-pp can be started directly with this set. It contains:	
4 micropumps mp6-pp	
1 mp6-QuadOEM board	
4 pieces mp6-mol	
1 meter mp-t ID1.02 tubing	

mp6-QuadKEY Set	Order code: mp6-QuadKEY
The evaluation of the mp6 can be started directly with this set. It contains:	
4 micropumps mp6	
1 mp6-QuadKEY board (incl. 1 mp6-QuadOEM 1 microcrontoller board)	
1 mini-USB-cable	
1 meter mp-t ID1.3 tubing	



mp6-QuadKEY

mp6-AIR-QuadKEY Set	Order code: mp6-AIR-QuadKEY
The evaluation of the mp6-AIR can be started directly with this set. It contains:	
4 micropumps mp6-AIR	
1 mp6-QuadKEY board (incl. 1 mp6-QuadOEM 1 microcrontoller board)	
1 mini-USB-cable	
1 meter mp-t ID1.3 tubing	

mp6-pp-QuadKEY Set	Order code: mp6-pp-QuadKEY
The evaluation of the mp6-pp can be started directly with this set. It contains:	
4 micropumps mp6-pp	
1 mp6-QuadKEY board (incl. 1 mp6-QuadOEM 1 microcrontoller board)	
1 mini-USB-cable	
1 meter mp-t ID1.02 tubing	

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The offered accessories and kits are meant to assist your evaluation process. After the feasibility of the micropump in the customer specific application has been proven, an adequate miniaturization of the controller and the equipment can be carried out.

The design of customized controllers is part of the services offered by Bartels microComponents.

Please contact us, if we can support you in choosing the suitable equipment.

Sold in North America by:
Servoflo Corporation
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