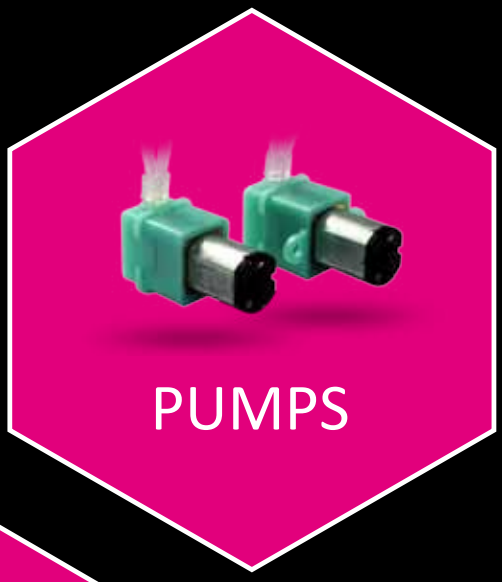
BMT
FLUID CONTROL SOLUTIONS

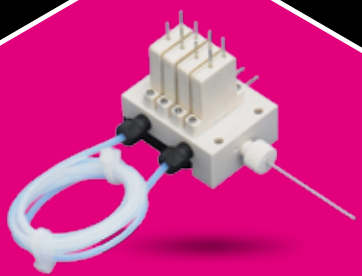
Innovations in Fluidics

ANALYTICAL AND MEDICAL TECHNOLOGY



PUMPS

VALVES



SYSTEMS

ANALYTICAL & MEDICAL TECHNOLOGY

Innovations in Fluidics

BMT Fluid Control Solutions has been offering pumps, valves, components and systems in the fields of analytics, medical, research and industry, since 1994.

We deliver products and modules that can be used for neutral gases and aggressive liquids. Through innovation and the highest quality, we always aim to provide an optimal solution for your specific applications.

State-of-the-art technology enables a compact design with outstanding performance. This qualifies our products for the use in microfluidics.

Constant improvements in manufacturing processes afford us the opportunity to offer technically and economically optimised components.

We follow a quality management system according to the standard DIN EN ISO 9001: 2015 in order to guarantee the highest quality.

Our qualified employees support you from the very first idea to full series production.

bsi
ISO 9001
Quality
Management
Systems
CERTIFIED

BMT Fluid Control Solutions GmbH - Max-Planck-Straße 16 - D - 61381 Friedrichsdorf

OVERVIEW DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way NO, 2/2-way latching
3/2-way, 3/2-way latching
Orifice diameter 0.4 - 6.0 mm (DN)

SMV Series

2/2-way NC
0.4 | 0.8 mm (DN)

FV / FLV Series

2/2-way NC
2/2-way latching
0.4 mm (DN)

NV / NLV Series

2/2-way NC
2/2-way latching
0.4 mm (DN)

EXAK / EXAKN Series

2/2-way NC
2/2-way NO
3/2-way
0.8 mm (DN)

KV Series

2/2-way NC
3/2-way
0.8 mm (DN)

WTE Series

2/2-way NC
3/2-way
1.0 mm (DN)

EXV Series

2/2-way NC
1.0 mm (DN)

STV Series

2/2-way NC
2/2-way NO
3/2-way
1.0 - 1.2 mm (DN)

RVB Series

2/2-way NC
2/2-way NO
3/2-way
1.6 mm (DN)
optional 0.8 mm (DN)

CTV Series

2/2-way NC
2/2-way NO
3/2-way
1.0 - 1.6 mm (DN)

WTA Series

2/2-way NC
2/2-way NO
1.2 - 2.0 mm (DN)

WTB Series

2/2-way NC
2/2-way NO
3/2-way
1.2 - 2.0 mm (DN)

WLB Series

2/2-way latching
3/2-way latching
1.2 - 2.0 mm (DN)

MTV Series

2/2-way NC
2/2-way NO
3/2-way
0.8 - 2.0 mm (DN)

WEG Series

2/2-way NC
3/2-way
2.0 mm (DN)

MLV Series

2/2-way NC
2/2-way NO
3/2-way
2.5 mm (DN)

WBV Series

2/2-way NC
4.0 mm (DN)

NRV Series

2/2-way NC
2/2-way NO
3/2-way
4.0 - 6.0 mm (DN)

PKV Series

2/2-way NC
2/2-way NO
3/2-way
4.0 - 6.0 mm (DN)

SHAPE MEMORY ALLOY VALVE

2/2-way shape memory alloy diaphragm isolation valve
Orifice diameter 0.4 mm (DN) | 0.8 mm (DN)
Low Cost

SMV Series

Shape Memory Alloy valve driver
12 VDC - 24 VDC

By using a shape memory alloy instead of a magnet, the switching is almost silent and requires an extremely low power of only 0.3 W.

With this technology the switching is significantly slower compared to solenoid valves, which means that the valves are especially suitable in applications that need to react sensitively to fast flow movements.

The compact design of only 4.0 x 18.4 x 19 mm and the O-ring connection allow space-saving integration in microfluidic systems.

The design and manufacturing method allows this valve to be used as a disposable and **low-cost solution.**

SPECIFICATIONS

	SMV Series
Type	2/2-way NC
Orifice diameter	0.4 mm (DN) | 0.8 mm (DN)
Port connection	Hose Barbs | O-Ring
Electrical supply	Constant current: 250 mA (Operation with resistor between valve and power supply: 45 Ω - 5 W using 12 VDC, 10 Ω - 1 W using 2x AA battery)
Operating pressure range	Inlet: 0 - 1000 mbar (Customised models: 0 - 2000 mbar | 0 - 2500 mbar) Outlet: 0 - 500 mbar (Customised models: 0 - 1000 mbar)
Diaphragm material	FPM | EPDM | FFKM
Body material	PPS | PEEK
Response time	approx. 600 ms
Fluid temperature range	5 - 40°C
Ambient temperature range	5 - 40°C
Power consumption	0.3 W
Operating duration	max. 0.6 Hz
Outer dimensions (depending on the model)	4.0 x 18.4 x 19.0 mm
Weight	approx. 1 g

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different port connections, ...)

ULTRA-MINIATURE DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way latching
Orifice diameter 0.4 mm (DN)

FV / FLV Series

2/2-way diaphragm isolation solenoid valve
- Available in a latching version too.

NV / NLV Series

2/2-way diaphragm isolation solenoid valve
- Available in a latching version too.

With an orifice diameter of 0.4 mm and exterior dimensions of only 4.2 x 4.2 x 23.1 mm (FV / FLV series) or Ø5.7 x 32.5 mm (NL / NLV series) these valves are ideally suited for microfluidic applications with the highest demands. The latching design results in low power consumption and low heat generation.

Internal volume: 1.1 µl | 1.5 µl | 4.3 µl (depending on the valve body type).

SPECIFICATIONS

	FV Series	FLV Series	NV Series	NLV Series
Type	2/2-way NC	2/2-way latching	2/2-way NC	2/2-way latching
Orifice diameter	0.4 mm (DN)			
Port connection	Hose Barbs | Flange			
Rated voltage	5 VDC | 12 VDC	5 VDC | 12 VDC | 24 VDC		
Operating pressure range	Inlet: 0 - 1000 mbar Outlet: 0 - 500 mbar		Inlet: 0 - 1000 mbar Outlet: 0 - 500 mbar **(higher operating pressure on request)**	
Diaphragm material	Perfluoroelastomer (FFKM) | FPM			
Body material	PEEK | PPS			
Seal material	Perfluoroelastomer (FFKM) | FPM			
Fluid temperature range	10 - 50°C			
Ambient temperature range	10 - 50°C			
Power consumption	1 W (5 VDC) 1.2 W (12 VDC)	2.4 W - 3 W (when switching)	1 W	1.5 W (when switching)
Operating duration	40% ED	20% ED	40% ED	20% ED
Outer dimensions (depending on the model)	4.2 x 4.2 x 23.1 mm Height depends on fluidic port connection		Ø5.7 x 32.5 mm Height depends on fluidic port connection	

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way NO, 3/2-way
Orifice diameter 0.8 mm (DN)
Zero pumping volume valves

EXAK Series

EXAKN Series

2/2-way and 3/2-way diaphragm isolation solenoid valves with zero pumping volume.

Pumping volume EXAKN

Port	ON - 1 (µl)	OFF - 1 (µl)	ON - 2 (µl)	OFF - 2 (µl)	ON - 3 (µl)	OFF - 3 (µl)
COM	+ 0.002	- 0.015	+ 0.002	- 0.015	+ 0.002	- 0.015
NC	+ 0.024	- 0.010	+ 0.024	- 0.010	+ 0.024	- 0.010
NO	+ 0.005	- 0.005	+ 0.005	- 0.005	+ 0.005	- 0.005

SPECIFICATIONS

	EXAK Series	EXAKN Series
Type	2/2-way NC | 2/2-way NO | 3/2-way	
Orifice diameter	0.8 mm (DN)	
Port connection	M5 | Hose Barbs	
Rated voltage	12 VDC | 24 VDC	
Operating pressure range	Inlet: -400 - 1000 mbar Outlet (NC | NO): 0 - 500 mbar	Inlet: -400 - 3000 mbar Outlet (NC | NO): 0 - 1500 mbar
Diaphragm material	PTFE	
Body material	PFA	ETFE
Seal material	PTFE	Perfluoroelastomer (FFKM)
Other wetted materials	-	PVDF (for 3/2-way)
Fluid temperature range	0 - 60°C	
Ambient temperature range	0 - 50°C	0 - 60°C
Power consumption	0.94 W	1.2 W
Operating duration	100% ED	
Outer dimensions (depending on the model)	Ø12.0 x 48.1 mm	Ø14.0 x 42.3 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 3/2-way
Orifice diameter 0.8 - 1.0 mm (DN)

KV Series

2/2-way and 3/2-way miniature diaphragm isolation solenoid valves.

With an orifice diameter of 0.8 mm and a width of only 6 mm these valves can be integrated in a compact production design.

WTE Series

2/2-way and 3/2-way miniature diaphragm isolation solenoid valves with an orifice diameter of 1.0 mm and a pressure range from -650 mbar up to 1000 mbar at the inlet.

Due to higher vacuum range these isolation valves are especially suitable for use on the inlet side of the pump. The compact design enables the smallest manifold solutions to be integrated into your application.

SPECIFICATIONS

	KV Series	WTE Series
Type	2/2-way NC | 3/2-way	2/2-way NC 3/2-way (under development)
Orifice diameter	0.8 mm (DN)	1.0 mm (DN)
Port connection	Flange	
Rated voltage	12 VDC | 24 VDC	
Operating pressure range	Inlet: 0 - 1000 mbar Outlet (NC, NO): 0 - 500 mbar	Inlet: -650 - 1000 mbar Outlet: 0 - 100 mbar
Diaphragm material	Perfluoroelastomer (FFKM) | FPM	PTFE
Body material	PEEK | PPS	
Seal material | Soft-Seal	Perfluoroelastomer (FFKM) | FPM	Perfluoroelastomer (FFKM) | FPM
Fluid temperature range	5 - 50°C	5 - 50°C
Ambient temperature range	5 - 40°C	5 - 50°C
Power consumption	1.8 W	1.5 W
Operating duration	100% ED	100% ED
Outer dimensions (depending on the model)	6.0 x 50.0 x 12.5 mm	19.0 x 11.0 x 31.3 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way NO, 3/2-way
Orifice diameter 1.0 - 1.2 mm (DN)

EXV Series

2/2-way diaphragm isolation solenoid valves.

Due to a small internal volume of only 4 µl (inlet), 25 µl (outlet) and a low pumping volume, liquids can be precisely controlled with this valve series.

The flange connection and the small size allow for easy integration into compact modules.

STV Series

2/2-way and 3/2-way diaphragm isolation solenoid valves.

A large selection of wetted materials and connection options enable a wide range of applications.

For this series there is a 2/2-way version available with push-in fittings. These connections allow the use of PTFE or PFA tubes with an outer diameter of 2.0 mm.

SPECIFICATIONS

	EXV Series	STV Series
Type	2/2-way NC	2/2-way NC | 2/2-way NO | 3/2-way
Orifice diameter	1.0 mm (DN)	1.0 - 1.2 mm (DN)
Port connection	Flange	M6 | 1/4-28UNF | Hose Barbs Flange | Push-In fittings (for 2/2-way)
Rated voltage	12 VDC | 24 VDC	
Operating pressure range	Inlet: -200 - 2000 mbar Outlet: -500 - 2000 mbar	Inlet: -900 - 2000 mbar Outlet (NC | NO): 0 - 500 mbar
Diaphragm material	PTFE	PTFE
Body material	PTFE | PCTFE | PEEK | PPS	PEEK | PPS | PTFE | POM
Seal material | Soft-Seal	Perfluoroelastomer (FFKM) | FPM	PTFE | Perfluoroelastomer (FFKM) | FPM
Other wetted materials	-	PTFE | Ceramic - Al_2O_3 with 3/2-way
Fluid temperature range	0 - 40°C	0 - 50°C
Ambient temperature range	0 - 40°C	0 - 50°C
Power consumption	2.8 W	1.7 - 2.9 W (depending on the model)
Operating duration	100% ED	100% ED
Outer dimensions (depending on the model)	14.0 x 25.0 x 31.7 mm	Ø20.0 x 42.5 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way NO, 3/2-way
Orifice diameter 1.6 mm (DN) | optional 0.8 mm (DN)
Rocker valve

RVB Series

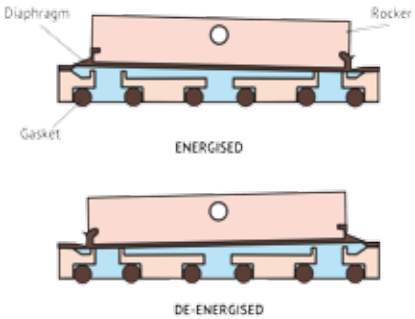
2/2-way and 3/2-way rocker diaphragm isolation solenoid valves.

With an orifice diameter of 1.6 mm as standard, pressures up to 2 bar and a vacuum down to -950 mbar are possible at all connections. With 0.8 mm orifice diameter up to 6 bar can be achieved - which makes its use in bidirectional fluidic systems at high pressure or vacuum possible.

Special designs with an optimised pumping volume enable the use in demanding analysis applications.

Optionally, electronics can be integrated in the valve housing in order to reduce the operating voltage.

The flange connections of this valve series are available in different dimensions.



SPECIFICATIONS

	RVB Series
Type	2/2-way NC | 2/2-way NO | 3/2-way
Orifice diameter	1.6 mm (DN) | optional 0.8 mm (DN)
Port connection	Flange
Rated voltage	12 VDC | 24 VDC
Operating pressure range	Inlet and Outlet (NC | NO): -950 - 2000 mbar optional for 0.8 mm (DN): up to 6000 mbar
Diaphragm material	Perfluoroelastomer (FFKM) | EPDM | FPM
Body material	PEEK | PPS
Seal material	Perfluoroelastomer (FFKM) | EPDM | FPM
Fluid temperature range	0 - 60°C (with membrane: EPDM | FPM) 5 - 60°C (with membrane: Perfluoroelastomer FFKM)
Ambient temperature range	0 - 55°C (with membrane: EPDM | FPM) 5 - 55°C (with membrane: Perfluoroelastomer FFKM)
Power consumption	3.4 W 0.85 W (using for holding voltage electronic)
Operating duration	100% ED
Outer dimensions	16.0 x 27.0 x 46.0 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way NO, 3/2-way
Orifice diameter 1.0 - 2.0 mm (DN)

CTV Series

2/2-way and 3/2-way diaphragm isolation solenoid valves.

A large selection of materials in contact with the media, connection options and a very large pressure range enable a wide range of applications.

WTA Series

2/2-way diaphragm isolation solenoid valves

Through a large pressure range and a variety of connections this valve series covers a wide range of applications. Highly inert designs with wetted materials such as PTFE, PEEK and FFKM offer high chemical resistance.

2/2-way versions with Push-In fittings are available for these series. The connections allow the use of PTFE or PFA tubes with an outer diameter of 2.0 mm.

SPECIFICATIONS

	CTV Series	WTA Series
Type	2/2-way NC | 2/2-way NO | 3/2-way	2/2-way NC
Orifice diameter	1.0 - 1.6 mm (DN)	1.2 - 2.0 mm (DN)
Port connection	M6 | 1/4-28UNF | Hose Barbs | Flange | Push-In fittings (for 2/2-way)	
Rated voltage	12 VDC | 24 VDC	
Operating pressure range	Inlet: -500 - 2000 mbar (Customised models up to 6000 mbar) Outlet (NC | NO): 0 - 500 mbar	Inlet: -900 - 2000 mbar (Customised models up to 6000 mbar) Outlet (NC | NO): 0 - 1000 mbar
Diaphragm material	PTFE	
Body material	PEEK | PPS | PTFE | POM	PEEK | PPS | PTFE
Seal material | Soft-Seal	PTFE | Perfluoroelastomer (FFKM) | FPM | EPDM	
Other wetted materials	PTFE | Ceramic - Al_2O_3 PEEK (for 3/2-way)	-
Fluid temperature range	0 - 50°C	5 - 50°C
Ambient temperature range	0 - 50°C	5 - 50°C
Power consumption	1.9 - 4.4 W (depending on the model)	2.8 - 3.4 W (depending on the model)
Operating duration	100% ED	
Outer dimensions (depending on the model)	Ø21.0 x 59.8 mm	24.0 x 20.6 x 53.9 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way NO, 3/2-way, 2/2-way latching, 3/2-way latching
Orifice diameter 1.2 - 2.0 mm (DN)

WTB Series

2/2-way and 3/2-way diaphragm isolation solenoid valves.

With a large pressure range and a variety of connection options this valve series cover a wide range of applications. Highly inert designs with wetted materials such as PTFE, PEEK and FFKM offer high chemical resistance.

WLB Series

2/2-way and 3/2-way diaphragm isolation solenoid valves in a latching version.

A low power consumption and heat generation is achieved due to the latching design - optimal for battery operated applications and liquids that react sensitively to heat transfer.

SPECIFICATIONS

	WTB Series	WLB Series
Type	2/2-way NC | 2/2-way NO | 3/2-way	2/2-way latching | 3/2-way latching
Orifice diameter	1.2 - 2.0 mm (DN)	
Port connection	M6 | 1/4-28UNF | Hose Barbs | Flange	
Rated voltage	12 VDC | 24 VDC	
Operating pressure range	Inlet: -900 - 2000 mbar (Customised models up to 6000 mbar) Outlet (NC | NO): 0 - 1000 mbar (Customised models up to 3000 mbar)	Inlet: -900 - 2000 mbar Outlet (NC): 0 - 1000 mbar Outlet (NC | NO): 0 - 500 mbar (for 3/2-way)
Diaphragm material	PTFE	
Body material	PEEK | PPS | PTFE	
Seal material | Soft-Seal	PTFE | Perfluoroelastomer (FFKM) | FPM | EPDM	
Other wetted materials	PTFE	
Fluid temperature range	5 - 50°C	5 - 50°C
Ambient temperature range	5 - 50°C	5 - 50°C
Power consumption	2.8 - 3.4 W (depending on the model)	8 W (when switching)
Operating duration	100% ED	10% ED
Outer dimensions (depending on the model)	24.0 x 20.6 x 55.9 mm	

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way NO, 3/2-way
Orifice diameter 0.8 - 2.0 mm (DN)

MTV Series

2/2-way and 3/2-way diaphragm isolation solenoid valves.

This series of isolation valves offers various models optimised for their internal volume and pumping volume. There are also valves for high-temperature fluid and for pressures up to 8 bar. Due to their high vacuum suitability on the inlet side, these valves can also be used in front of the pump on the suction side.

WEG Series

2/2-way and 3/2-way diaphragm isolation solenoid valves.

Less pumping volume compared to conventional valves.

With a pressure range of -900 to 2000 mbar on all connections this valve series is suitable for pressure and vacuum applications.

SPECIFICATIONS

	MTV Series	WEG Series
Type	2/2-way NC | 2/2-way NO | 3/2-way	2/2-way NC | 3/2-way
Orifice diameter	0.8 - 2.0 mm (DN)	2.0 mm (DN)
Port connection	M6 | 1/4-28UNF | Hose Barbs | Flange	Hose Barbs
Rated voltage	12 VDC | 24 VDC	
Operating pressure range	Inlet: -1000 - 2000 mbar (Customised models up to 8000 mbar) Outlet (NC | NO): 0 - 1000 mbar	Inlet: -900 - 2000 mbar Outlet: -900 - 2000 mbar
Diaphragm material	PTFE	EPDM (Optional: FPM)
Body material	PEEK | PPS | PTFE | PCTFE | POM | HPVC	PPS
Seal material | Soft-Seal	PTFE | Perfluoroelastomer (FFKM) | FPM	EPDM | FPM
Other wetted materials	PTFE | Ceramic - Al_2O_3 PEEK (for 3/2-way)	PTFE | Ceramic - Al_2O_3 (for 3/2-way)
Fluid temperature range	0 - 60°C 5 - 60°C (for: Perfluoroelastomer FFKM)	5 - 50°C
Ambient temperature range	0 - 60°C 5 - 60°C (for: Perfluoroelastomer FFKM)	5 - 50°C
Power consumption	1.9 - 4.4 W (depending on the model)	2.6 W
Operating duration	100% ED	
Outer dimensions (depending on the model)	Ø26.0 x 57.0 mm	21.0 x 16.0 x 54.4 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way NO, 3/2-way
Orifice diameter 2.5 mm (DN) | 4.0 mm (DN)

MLV Series

2/2-way and 3/2-way diaphragm isolation solenoid valves.

With an orifice diameter of 2.5 mm this valve series enables significantly higher flow rates than the standard MTV, WTA and WTB series and is still extremely compact, compared to the diaphragm isolation solenoid valves with high flow rates and an orifice diameter of 4.0 to 6.0 mm.

WBV Series

2/2-way diaphragm isolation solenoid valves normally closed.

Designed for dialysis machines and waste lines with a large orifice diameter of 4 mm and a compact design. With a media temperature range of up to 95°C and a low power consumption of 6 W it offers advantages compared to other models. An O-ring version that can be mounted directly on the balance chamber is available too.

SPECIFICATIONS

	MLV Series	WBV Series
Type	2/2-way NC | 2/2-way NO | 3/2-way	2/2-way NC
Orifice diameter	2.5 mm (DN)	4.0 mm (DN)
Port connection	M8 | 5/16-24UNF | Rc1/8 | 1/8-27NPT	Hose Barbs | O-Ring
Rated voltage	12 VDC | 24 VDC	
Operating pressure range	Inlet: -400 - 2000 mbar Outlet (NC | NO): 0 - 500 mbar	Inlet: -900 - 3000 mbar Outlet: -900 - 3000 mbar
Diaphragm material	PTFE	EPDM | FPM
Body material	PEEK | PTFE | PCTFE | POM | HPVC	PPS
Seal material | Soft-Seal	PTFE | Perfluoroelastomer (FFKM) | FPM	-
Other wetted materials	PTFE | Ceramic - Al_2O_3 (for 3/2-way)	-
Fluid temperature range	0 - 60°C 5 - 60°C (for Soft-Seal: Perfluoroelastomer FFKM)	5 - 95°C
Ambient temperature range		0 - 50°C
Power consumption	3.1 - 4.4 W (depending on the model)	6 W
Operating duration	100% ED	
Outer dimensions (depending on the model)	Ø30.0 x 57.2 mm	48.0 - 57.0 x 33.0 x 84.8 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

DIAPHRAGM ISOLATION SOLENOID VALVES

2/2-way NC, 2/2-way NO, 3/2-way
Orifice diameter 4.0 - 6.0 mm (DN)

NRV Series

2/2-way and 3/2-way solenoid valves with diaphragm isolation and large orifice diameter.

This valve series offers designs only made of PTFE, which results in high chemical resistance.

PKV Series

2/2-way and 3/2-way solenoid valves with diaphragm isolation and large orifice diameter.

A large selection of connection options enables easy integration into fluidic systems.

SPECIFICATIONS

	NRV Series	PKV Series
Type	2/2-way NC | 2/2-way NO | 3/2-way	
Orifice diameter	4.0 - 6.0 mm (DN)	
Port connection	Rc1/8 | Rc1/4 | 1/8-27NPT | 1/4-18NPT	Rc1/8 | Rc1/4 | 1/8-27NPT | 1/4-18NPT Hose Barbs
Rated voltage	12 VDC | 24 VDC	
Operating pressure range	Inlet: -900 - 2000 mbar Outlet (NC | NO): 0 - 500 mbar	
Diaphragm material	PTFE	
Body material	PTFE | PEEK | PPS | HPVC	
Seal material | Soft-Seal	PTFE | Perfluoroelastomer (FFKM) | FPM	Perfluoroelastomer (FFKM) | FPM | EPDM
Other wetted materials	PTFE | PCTFE | Ceramic - Al_2O_3 (for 3/2-way)	
Fluid temperature range	0 - 60°C 5 - 60°C (for Soft-Seal: Perfluoroelastomer FFKM)	5 - 60°C
Ambient temperature range	0 - 60°C 5 - 60°C (for Soft-Seal: Perfluoroelastomer FFKM)	5 - 40°C
Power consumption	5.5 W	6.0 - 10.0 W (depending on the model)
Operating duration	100% ED	
Outer dimensions (depending on the model)	Ø44.0 - 45.0 x 80.0 - 84.0 mm	40.0 x 42.0 x 71.0 - 85.3 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

SLIDER VALVES

2/2-way NC, 3/2-way
Orifice diameter 0.4 | 1.0 mm (DN)

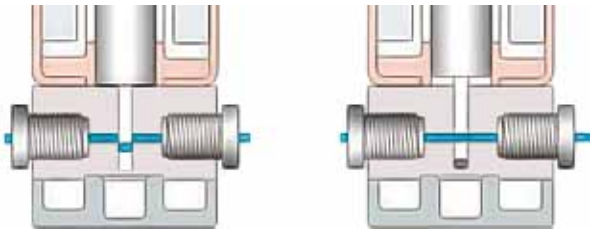
Slider valve

2/2-way and 3/2-way slider valves enable a high-pressure range of up to 5 bar.

Because of the innovative design, the negative pumping volume effect, which is disadvantageous for many analysis instruments, is almost eliminated and a possible cross-contamination of the samples is also significantly reduced. The internal volume is:

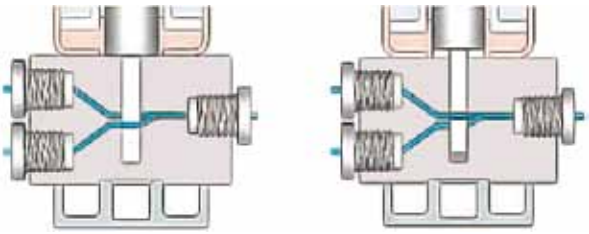
- 0.4 mm DN: 1.5 µl (2/2-way) | 3.7 µl (3/2-way)
- 1.0 mm DN: 16.5 µl (2/2-way) | 32.2 µl (3/2-way)

Operating principle of a 2/2-way slider valve



OFF ON

Operating principle of a 3/2-way slider valve



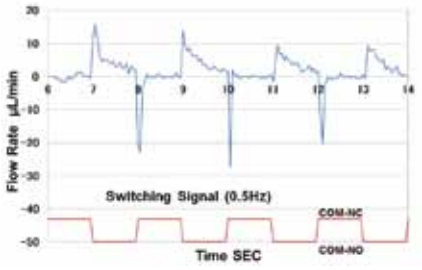
OFF ON

SPECIFICATIONS

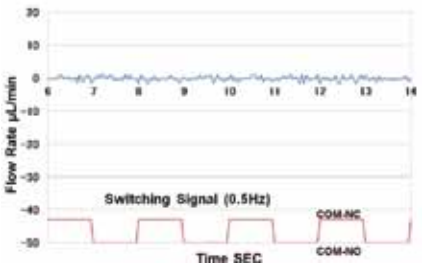
	Slider value
Type	2/2-way NC	3/2-way
Orifice diameter	0.4 mm	1.0 mm (DN)
Port connection	10-32UNF (0.4 mm DN) M6	1/4-28UNF (1.0 mm DN)
Rated voltage	12 VDC	24 VDC
Operating pressure range	Inlet: 0 - 5000 mbar (0.4 mm DN) -900 - 3000 mbar (1.0 mm DN)
Body material	PEEK
Other wetted materials	PTFE , Ceramic - Al_2O_3 (0.4 mm DN) SiC (Silicon Carbide) (1.0 mm DN)
Fluid temperature range	10 - 50°C
Ambient temperature range	10 - 50°C
Power consumption	18 W (0.4 mm DN) 16 W (1.0 mm DN)
Operating duration	15% ED (for orifice diameter 0.4 mm DN) 33% ED (for orifice diameter 1.0 mm DN) 100% ED with holding voltage
Outer dimensions	24.0 x 34.0 - 38.5 x 62.0 mm (0.4 mm DN) 38.0 x 38.0 - 41.5 x 86.0 mm (1.0 mm DN)

Comparison of the pumping volume of conventional valves with a diaphragm:

Pumping volume KV-3K series (standard valve)



Pumping volume slider valve



Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

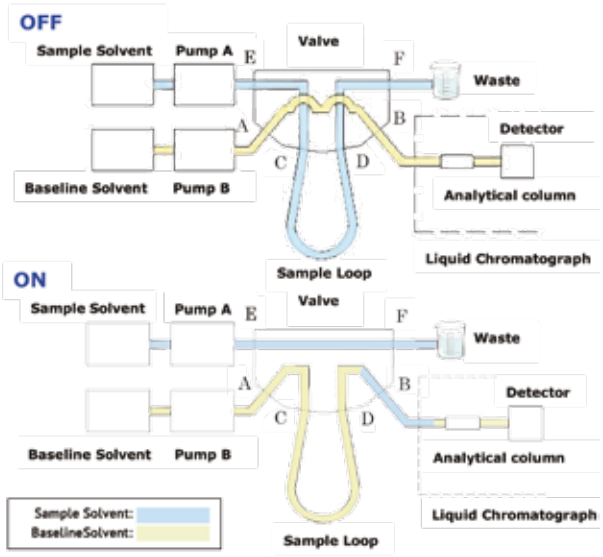
SAMPLE INJECTION VALVE

2 positions, 6 connections
Orifice diameter 0.4 mm (DN)

Sample injection valve

This 2-position, 6-port valve is the first solenoid valve for injecting samples, which is controlled with a linear actuator.

As an alternative to conventional rotary valves, this solution offers various advantages. It is much easier to control, offers a smaller design and has a long service life. The internal volume is only 9.0 µl. A valve with 2 positions and 4 ports is also available.



SPECIFICATIONS

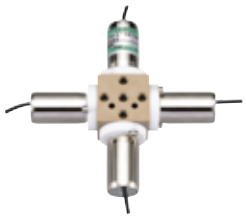
	Sample injection valve
Type	2 positions, 6 connections
Orifice diameter	0.4 mm (DN)
Port connection	10-32UNF
Rated voltage	12 VDC | 24 VDC
Operating pressure range	Inlet: 0 - 5000 mbar (High pressure version: 0 - 25000 mbar)
Body material	PEEK
Other wetted materials	PTFE, SiC (Silicon Carbide) (ZrO_2 (Zirconium Dioxide) for high pressure version)
Fluid temperature range	5 - 50°C
Ambient temperature range	5 - 50°C
Power consumption	23 W (3.6 W using holding voltage electronics) (18 W (3.0 W using holding voltage electronics) for high pressure version)
Outer dimensions	33.0 x 42.0 x 62.0 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

LOW PRESSURE GRADIENT MIXING VALVE
VALVES FOR HIGH-TEMPERATURE SULPHURIC ACID

4x 2/2-way NC, 2/2-way NC
Orifice diameter 1.2 mm (DN) | 1.8 mm (DN)

Low pressure gradient mixing valve



This 4-way manifold valve, which was specially developed for low-pressure gradient mixers, guides all four inlets to the same outlet. These four inlets can be controlled via individual solenoid valves to generate the required mixing ratios. Because the length of the individual channels to the joint outlet is the same, very high accuracy of the mixing ratio is achieved.

Valve for high-temperature sulphuric acid

2/2-way diaphragm isolation solenoid valve for high-temperature sulphuric acid (up to 180°C).

Because of its unique construction, changes in the plastic body due to the high temperatures are absorbed. Consequently, this valve does not lose its tightness with high-temperature liquids.

SPECIFICATIONS

	Low pressure gradient mixing valve	Valve for high-temperature sulphuric acid
Type	4x 2/2-way NC	2/2-way NC
Orifice diameter	1.2 mm (DN)	1.8 mm (DN)
Port connection	M6 | 1/4-28UNF	
Rated voltage	12 VDC | 24 VDC	
Operating pressure range	Inlet: 0 - 500 mbar Outlet: -650 - 1500 mbar	Inlet: 0 - 8000 mbar Outlet: 0 - 1000 mbar
Diaphragm material	PTFE	PFA
Seal material	(Perfluoroelastomer (FFKM) as sealing material between valves and manifold, not in direct contact with the fluid)	Perfluoroelastomer (FFKM)
Body material	PEEK	PFA
Fluid temperature range	5 - 40°C	5 - 180°C
Ambient temperature range	5 - 40°C	5 - 40°C
Power consumption	4 x 3.5 W	7.6 W
Operating duration	100% ED	20% ED
Outer dimensions	117.0 x 117.0 x 31.0 mm	Ø25.0 x 47.5 mm

DIAPHRAGM ISOLATION PROPORTIONAL SOLENOID VALVES MANIFOLD XTA-SERIES – UP TO 12 STATIONS

Orifice diameter 4.0 mm (DN) | 1.6 mm (DN)

NPV-Series

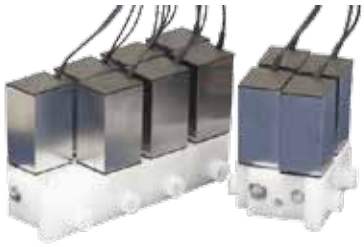
2/2-way diaphragm isolation proportional solenoid valves.

With these valves the flow rate can be controlled via the operating voltage.

Wetted materials exclusively made of PTFE enable use in applications that require a high chemical resistance.

The adjustable flow rates are:
- 0 - 30 l/min (ΔP = 100 mbar, air)
- 0 - 4 l/min (ΔP = 1000 mbar, water)

Manifold XTA-Series – up to 12 stations



This manifold consists of individual base blocks each with two 2/2-way valves of the XTA / WTA series. Up to 6 blocks can be connected, which creates manifold solutions with up to 12 stations.

The injection moulded blocks made of ETFE (fluorocarbon polymer) result in high chemical resistance and an economically optimised production method.

The standard orifice diameter is 1.6 mm with standard connections in M6, ¼-28UNF or Push-In fittings.

SPECIFICATIONS

	NPV Series	XTA Manifold Series
Type	2/2-way NC - proportional	2/2-way NC
Orifice diameter	4.0 mm (DN)	1.6 mm (DN)
Port connection	Rc1/8 | Rc1/4	M6 | 1/4-28UNF Push-in fittings (optional)
Rated voltage	24 VDC	12 VDC | 24 VDC
Operating pressure range	Inlet: 0 - 1000 mbar Outlet: 0 - 500 mbar	Inlet: -900 - 2000 mbar Outlet: 0 - 500 mbar
Diaphragm material	PTFE	PTFE
Seal material	-	FFKM | FPM EPDM (optional)
Body material	PTFE	ETFE
Fluid temperature range	10 - 60°C	5 - 50°C
Ambient temperature range	10 - 60°C	5 - 50°C
Power consumption	7.0 W	2.8 W x Number of valves
Operating duration	100% ED	100% ED
Outer dimensions	Ø40.0 x 95.0 mm	55.7 x 63.7 x 76.4 mm - 197.2 mm (depending on the number of valves)

CARTRIDGE VALVES
PRESSURE RELIEF VALVE
NEEDLE VALVES

Cartridge valves

These solenoid valves offer the possibility of removing the diaphragm isolated valve body from the magnet – without using a tool.

The valve body is autoclavable and therefore reusable. The orientation of the valve body is arbitrary and can be freely rotated.

Its high chemical resistance enables a great field of application, for example in regenerative medicine.

Pressure relief valves

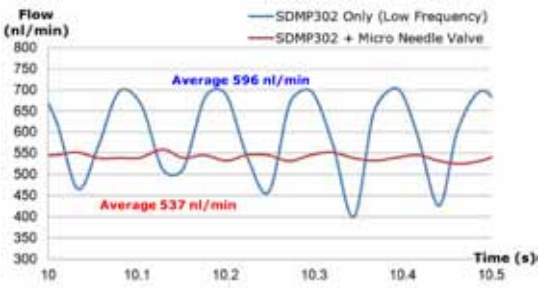
High resistance due to body made of PEEK and diaphragm made of PTFE with FFKM soft seal.

Integrated in the flow path, the valve opens when the maximum desired pressure is reached. This protects sensitive components in analysis systems against undesired pressure peaks.

By installing it directly in the fluidic path (3-port flowthrough structure), dead volumes are prevented.

Miniature needle valve

This valve is highly resistant due to wetted materials such as Perfluoroelastomer (FFKM) and PEEK (depending on the model also stainless steel).

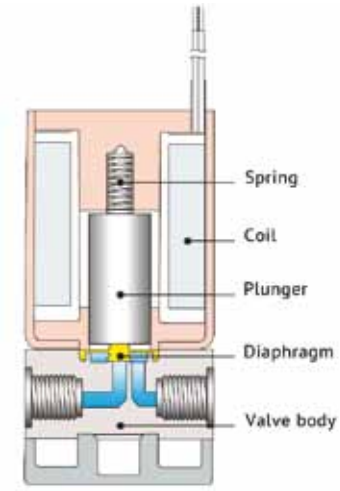


If a micro needle valve of the MNV series is used at the outlet of a piezo pump or a peristaltic pump, the pulsation is significantly dampened. The pulsation of an SDMP302 piezo pump is almost completely dampened, which can be seen in the adjacent graphic.

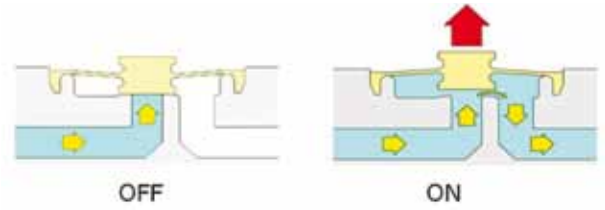
TECHNICAL INFORMATION
DIAPHRAGM ISOLATION SOLENOID VALVES

Typical structure of diaphragm isolation solenoid valves

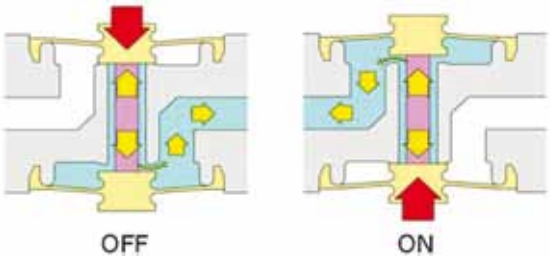
The diaphragm isolation solenoid valves consists of two parts. One is the valve part, which opens and closes the flow path, and the other part is the actuator part, which operates the valve part. A membrane (diaphragm) inside the valve isolates these two parts from each other. The diaphragm prevents fluids running inside the valve part (made of highly inert plastics such as PTFE and PEEK) from flowing into the actuator mainly made of metals. This function of the diaphragm prevents fluids from corroding the actuator. Over the cycles of operations, metal dusts etc. are generated from the actuator, and the diaphragm also prevents the dusts from mixing into fluids.
This structure is ideal for applications such as sampling devices of analytical instruments and medical instruments, which do not tolerate impurities. It is also suitable for handling acids and chemicals which corrode metals.



Operating principle 2/2-way NC diaphragm isolation solenoid valves



Operating principle 3/2-way NC diaphragm isolation solenoid valves



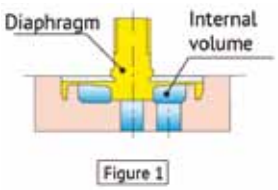


Figure 1

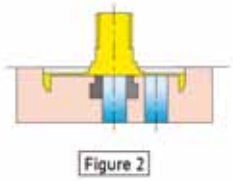


Figure 2

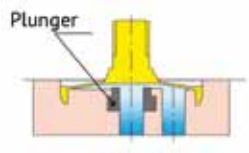


Figure 3

Optimised internal volume (zero internal volume)

The internal volume is determined by the space between the separating diaphragm and the valve body. When closing the valve, the internal volume is enclosed within the valve body. For hard sealing materials such as PTFE it is often not possible to completely flatten the valve seat.

A special chemically resistant elastomer is attached to the valve seat of the valves with optimised internal volume in order to completely flatten the seal. This ensures that no medium can become trapped in the valve body.

TECHNICAL INFORMATION
DIAPHRAGM ISOLATION SOLENOID VALVES

Pumping volume optimised valves (zero pumping volume)

When switching diaphragm separated solenoid valves, the separation diaphragm creates a pumping effect, as the separation diaphragm pulls and pushs volume through its movement. This pumping effect often has a negative influence on high-tech analytical instruments, such as high-precision dosing using a dispensing needle. By minimising this effect, a highly accurate dosage is possible.

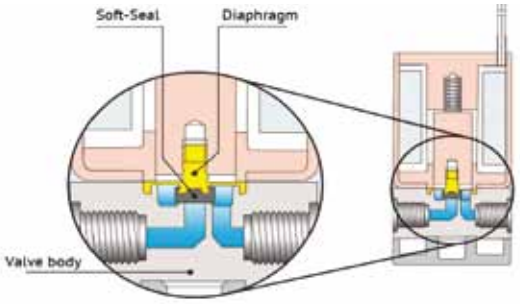
Due to this optimisation, diaphragm separated solenoid valves from the EXAKN or MTV series offer up to 100 times less pumping volume effect than conventional diaphragm separated valves.

Unit: µl

Type	PORT	ON-1	OFF-1	ON-2	OFF-2	ON-3	OFF-3
Zero-pumping volume type	COM	0.002	-0.015	0.002	-0.015	0.002	-0.015
	N.C.	0.024	-0.01	0.024	-0.01	0.024	-0.01
	N.O.	0.005	-0.005	0.005	-0.005	0.005	-0.005
Non-diaphram valve	IN	0.009	0.018	-0.018	0.009	-0.017	0.018
	OUT	-0.723	0.81	-0.71	0.826	-0.708	0.849
Conventional type	COM	2.346	2.609	2.425	2.604	2.427	2.551
	N.C.	2.63	2.317	2.481	2.293	2.521	2.34
	N.O.	7.238	7.373	7.443	7.395	7.506	7.388

Soft-Seal

The Soft-Seal is used in applications with slightly crystallised liquids or liquids with particles. A small seal made of chemically resistant elastomer protects the PTFE separation diaphragm from particles, which prevents leakage that is otherwise common with PTFE membranes. Due to good chemical resistance, a Perfluoroelastomer (FFKM) is used as a Soft-Seal for example.



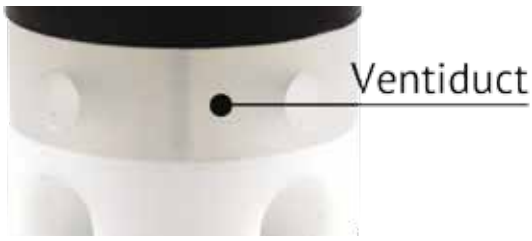
Ventiduct - to reduce heat transfer

Ventiduct is an optional component that is mounted between the valve body and the electromagnet to expand the separation of these two parts. This is used for example to meet the following requirements:

- For volatile and corrosive liquids
- For liquids with high temperatures
- For liquids that are very temperature sensitive

Under such conditions the Ventiduct significantly improves the properties of the valve. It protects the metal parts from volatile corrosive fluid, which can be further optimised by an additional separation diaphragm.

In addition, heat transfer from the electromagnet is significantly reduced to the fluid, and as a result, fluids with higher temperatures are possible. This is because the heat is not transferred to the magnet.



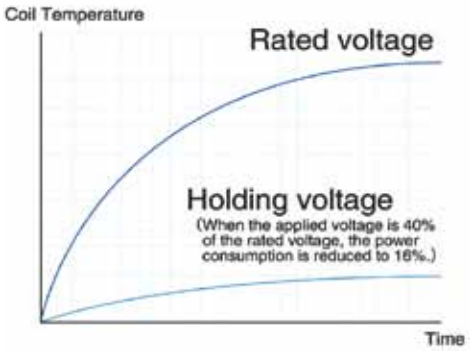
TECHNICAL INFORMATION
DIAPHRAGM ISOLATION SOLENOID VALVES

Holding voltage - Hit & Hold Circuit

After switching a solenoid valve by applying the specified voltage, the valve can also maintain this position at a much lower voltage (holding voltage).

For example, if a valve is switched with 24 VDC, the voltage can be reduced to 10 VDC under normal conditions to maintain this position.

This circuit provides various advantages, such as a significantly lower power consumption and significantly lower heating of the solenoid, optimisation of the reaction time, increased working pressure, minimisation of sizes, etc.

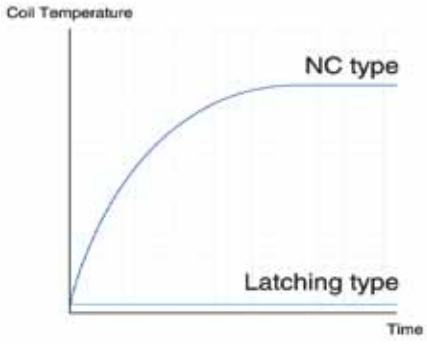


Input Voltage	5 VDC to 27 VDC
Switching time up to holding voltage	100 ms | 300 ms
Output voltage	40 % of the input voltage (after inrush time)

Latching solenoid valves

The use of latching magnet systems for valves offers the following advantages:

- Heating of the fluid or the environment by the heating of a permanently switched coil is reduced to almost zero.
- Elimination of the energy required to hold the magnet in one position. This makes highly energy-efficient systems possible and it is particularly suitable for battery-powered mobile systems.



A disadvantage of latching valves however is, that there is no de-energised safety position, as the valves maintain their current position in the event of a power failure and do not return to the "normal" position. In some applications, a normally closed position is mandatory to interrupt the flow of the fluid, if the unit shuts off unexpectedly due to system or power failure.

Push-In connections

For valve bodies with Push-In connections, plastic tubes made of PTFE / PFA with an outside diameter of 2 mm can be simply plugged in without further processing or additional accessories.
To disconnect, just push the end of the push-in connector and the tube can be removed.

MANIFOLDS & MODULES

Fluidic modules with pumps & valves

Valve blocks / valve manifolds / modules as standard solution and according to customer specifications

To optimise the installation space and the fluidics installation, we offer modules with valves and pumps as manifold solutions in a standard design and according to customer specifications.

To achieve the best possible solution, optimised for performance and cost, we work in close cooperation with our customers.

The variety of diaphragm isolation solenoid valves with flange connection allows for a wide range of design options to reduce the installation space of our customers' devices.

Furthermore, the valve seat of some valve series can also can be integrated directly into the manifold, further reducing the size and the cost of the module. The disadvantage of this solution is that individual valves can not be replaced during maintenance.

Multilayer manifolds

These manifolds are made by connecting multiple layers with integrated channels according to customer specifications. Unlike mechanical production, the channels can be freely designed - for example without corners and edges. By combining multiple layers, multilayer fluidic solutions can be realised. The bonding process uses no glue, so the properties of the materials used do not change and the fluidic channels will not become contaminated.

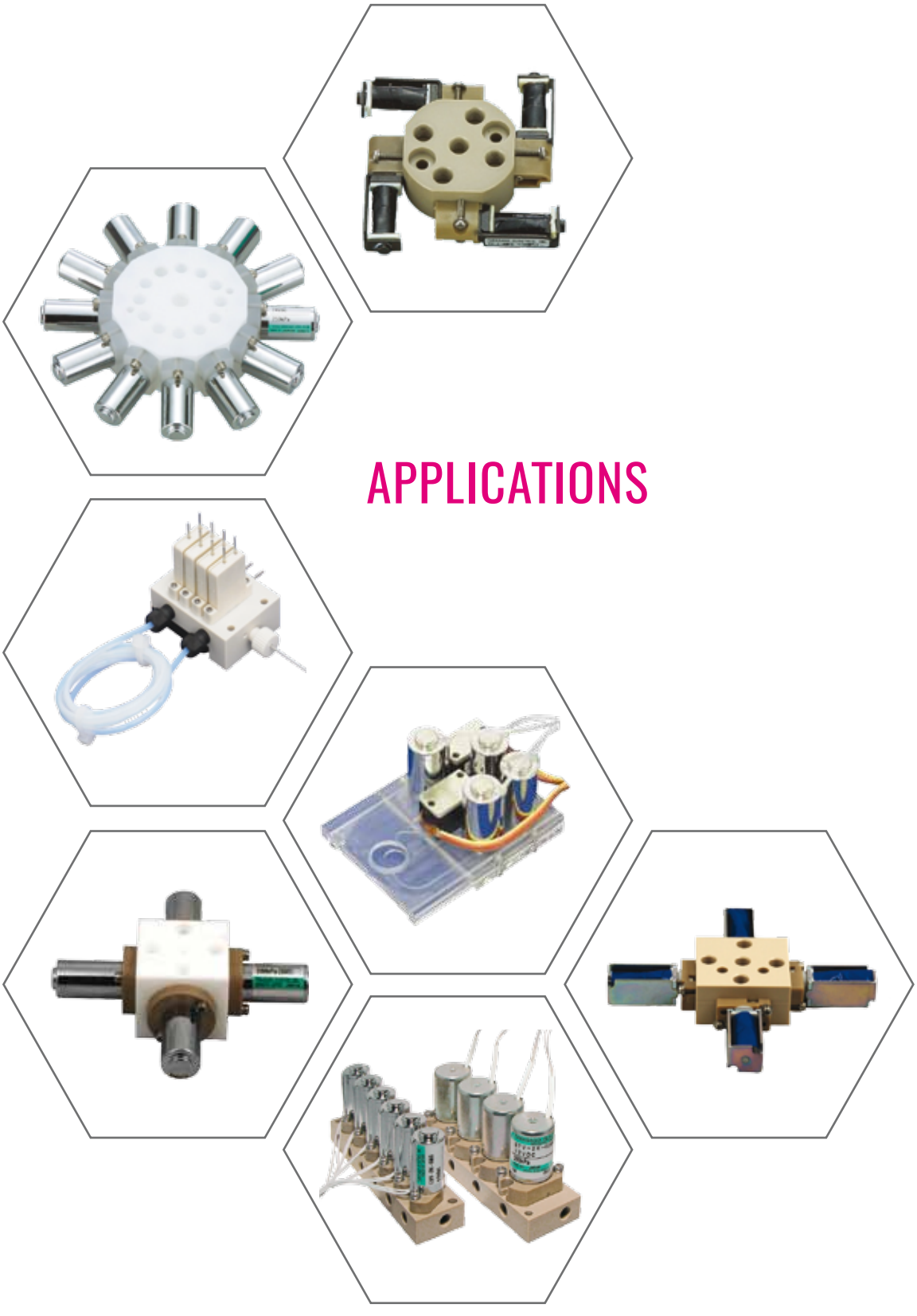
Bonded PTFE manifolds

Using a unique connection technology, we manufacture manifolds made of pure PTFE. This allows for maximum chemical resistance and curved channels can also be realised.

Due to the special connection technology - without glue - the channels remain free of contamination. The connection points are so precise that they can hardly be seen.

MANIFOLDS & MODULES

Fluidic modules with pumps & valves

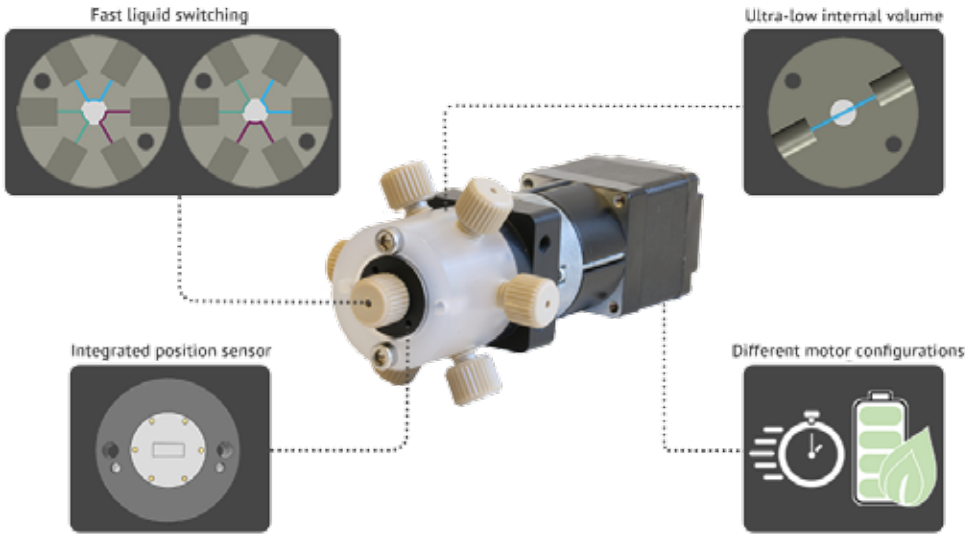


APPLICATIONS

ROTARY VALVES

Sample collection, selection, sample loop injection

The special positioning technology (encoder) with signal transmitters on the pump heads, enables channels with a diameter of 0.5 mm, internal volumes from 2.32 µl (from port connection to port connection) and carry over volumes from 0.55 µl (from port connection to port connection). Highly inert materials (PCTFE, PTFE) allow for their use with aggressive fluids. The miniature version of the rotary valve requires only a USB power supply. Due to its size, it is also suitable for mobile applications and microfluidics.



Fast liquid switching with very low carryover volume

Small diameter channels minimise the internal volume in the valve head and reduce the carryover volume between the port connections. This allows for a rapid switching between different media.

Integrated position sensor (encoder)

Each rotary valve has an integrated position sensor (encoder), which allows for very precise positioning of the valve head. When starting the valve, an automatic position detection recognizes the current valve position - also called “homing”.

Valve head configurations

Valve head configurations are available in different versions for sample collection, sample loop injection or channel selection. Customer specific solutions are also possible.

Ultra-low internal volume

Channels with a diameter of only 0.5 mm enable a small internal volume of only 2.3 to 2.9 µl (from port connection to port connection) and a very small carryover volume.

Different motor configurations: miniature motor and fast rotating motor

The miniature low-power rotary valve version P200-O is operated using USB voltage and is specially designed for low power consumption and portable applications. This version is also used for the miniaturisation of applications and in microfluidics.

The high-speed rotary valve P201-O offers a solution that allows fast switching between the individual channels with a rotation speed of 400 ms for a 180° rotation.

ROTARY VALVES

Sample collection, selection, sample loop injection

Miniature rotary valve low power - P200-0

Rotary valve fast rotating - P201-0

SPECIFICATIONS

	P200-0	P201-0
Motor	Stepper motor	
Rated voltage	5 - 10 VDC	18 - 24 VDC
Power consumption	0.5 A (peak)	2 A (peak)
Rotation speed	1500 ms for 180°	400 ms for 180°
Wetted materials	PCTFE (valve body) and PTFE (plunger)	
Fluid temperature range	5 - 40°C	
Ambient temperature range	5 - 40°C	
Operating humidity	20 - 80% (non condensing)	
Operating pressure (max.)	5 bar | 10 bar (on request)	
Channel diameter	0.5 mm | 0.4 - 1.0 mm (on request)	
Internal volume	2.32 - 2.84 µl (port-to-port) - Configuration dependent	
Carryover volume	0.55 - 1.07 µl (port-to-port) - Configuration dependent	
Dead volume	None	
Port connection	1/4-28 UNF (flat-bottom)	
Electrical interface	USB mini RS-232 | RS-485 (on request)	
Communication type	Serial | I^2C (others on request)	
Weight	approx. 250 g	approx. 450 g
Outer dimensions	29.0 x 38.3 x 111.8 mm	42.3 x 60.0 x 95.9 mm

AIR OPERATED VALVES WITH DIAPHRAGM ISOLATION

2/2-way NC, 3/2-way
Orifice diameter 1.8 - 5.0 mm (DN)

PMDP Series

PDT Series

In comparison to solenoid valves, a heating of the actuation is not transferred to the fluid, due to the pneumatic operation. A high working pressure range for all connections and media temperatures of up to 80°C allow for use in many applications which use compressed air for control.

SPECIFICATIONS

	PMDP Series	PDT Series
Type	2/2-way NC | 3/2-way	
Orifice diameter	1.8 - 2.0 mm (DN)	4.0 - 5.0 mm (DN)
Port connection	M6 | 1/4-28UNF	Rc1/8 | Rc1/4
Control pressure range	3000 - 6000 mbar	
Operating pressure range	Inlet: -1000 - 5000 mbar Outlet (NC | NO): 0 - 3000 mbar	Inlet: 0 - 3000 mbar Outlet (NC | NO): 0 - 1500 mbar
Diaphragm material	PTFE	PCTFE (for 3/2-way)
Body material	PEEK | PPS	PTFE | PCTFE
Seal material | Soft-Seal	Perfluoroelastomer (FFKM) | FPM	PTFE
Other wetted materials	PTFE	PCTFE
Fluid temperature range	5 - 60°C	0 - 80°C
Ambient temperature range	5 - 60°C	0 - 60°C
Outer dimensions	Ø25.0 x 41.9 - 47.7 mm	Ø44.5 x 52.0 - 67.0 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different port connections, ...)

INTEGRATED PINCH VALVE

No dead volume
Low internal volume

PSV-Series

- 3/2-way pinch valve with integrated FKM tube.
- The valves have no dead volume and a very low internal volume.
- High chemical resistance due to PPS as the body material and FKM as internal tube material.
- The maximum pressure of up to 2 bar can be applied to all ports.
- The port connections are available in different threads, as well as push-in.

SPECIFICATIONS

	PSV-Series
Orifice diameter	0.7 mm
Port connection	M6 | 1/4-28UNF | Push-in Fittings (optional)
Rated operating voltage	12 VDC | 24 VDC
Operating pressure range	0 - 2000 mbar
Internal tube material	FKM
Housing material	PPS
Fluid temperature range	5 - 45°C
Ambient temperature range	5 - 45°C
Power consumption	1.7 W
Mounting direction	Any
Fluid	Resistant to neutral and aggressive liquids / gases
Dimensions	Ø20 × H 59 mm (Threaded connection)

PINCH VALVES

2/2-way NC, 2/2-way NO, 2/2-way latching, 3/2-way, 3/2-way latching
Tubing inner diameter 0.8 - 2.0 mm (ID)
Tubing outer diameter 2.4 - 4.0 mm (OD)

PE Series

PS / PSK Series

PM / PMK Series

PL / PLK Series

SPECIFICATIONS

	PE Series	PS / PSK Series	PM / PMK Series	PL / PLK Series
Type	2/2-way NC | 2/2-way NO | 3/2-way			2/2-way latching 3/2-way latching
Tubing inner diameter	0.8 mm	0.8 - 2.0 mm		
Tubing outer diameter	2.4 mm	2.4 - 4.0 mm		
Rated voltage	12 VDC | 24 VDC			
Operating pressure	0 - 1000 mbar	0 - 1500 mbar		
Tubing material	Silicone	Silicone Pharmed®	Silicone Pharmed® | Tygon®	Silicone Pharmed®
Ambient temperature range	0 - 40°C	0 - 40°C	0 - 50°C	0 - 40°C
Power consumption	2.8 W	3.0 W	4.4 W	8.0 W (when switching)
Operating duration	100% ED			10% ED
Outer dimensions	21.0 x 26.0 x 55.1 mm	26.0 x 39.2 x 49.5 mm	26.0 x 40.0 x 60.0 mm	30.4 x 30.4 x 61.7 mm

The pinch valves can be specially adapted to your tube in order to achieve an optimal closing force.

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

PINCH VALVES

2/2-way NC, 2/2-way NO, 2/2-way latching
Tubing inner diameter 1.6 - 15.0 mm (ID)
Tubing outer diameter 4.0 - 19.0 mm (OD)

PK Series

NP Series

EPK Series

EL Series

SPECIFICATIONS

	PK Series	NP Series	EPK Series	EL Series
Type	2/2-way NC 2/2-way NO			2/2-way latching
Tubing inner diameter	1.6 - 6.4 mm		10.0 - 15.0 mm	
Tubing outer diameter	4.0 - 9.6 mm		13.0 - 19.0 mm	
Rated voltage	12 VDC | 24 VDC			
Operating pressure	0 - 500 mbar			
Tubing material	Silicone | Pharmed®		Silicone	
Ambient temperature range	0 - 40°C		-10 - 40°C	
Power consumption	10 W		60 W	15 W (when switching)
Operating duration	100% ED			10% ED
Outer dimensions	36.0 x 40.0 x 65.0 - 88.3 mm	36.0 x 40.0 x 64.5 - 87.5 mm	Ø64.0 x 112.0 - 132.0 mm	Ø64.0 x 128.7 - 140.7 mm

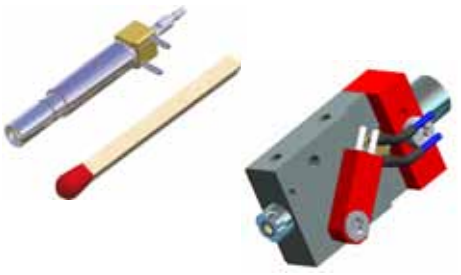
The pinch valves can be specially adapted to your tube in order to achieve an optimal closing force.

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

INLINE MICRO-JET VALVES – FAST-SWITCHING

Switching speed up to 4000 Hz
Contactless dosing of fluid up to 15000 mPa.s viscosity

Inline Micro-Jet valves



- Dosing media: water, reagents, oils, UV glue, pastes, etc.
- Fast switching: dosing speed up to 4000 Hz
- Hard sealing valve structure with sapphire and ruby
- Optimised for contactless dosing
- Dosage amount below 10 nl possible
- High reproducibility
- Grid width from 4 mm

ZJ6 – Low cost version with FKM (EPDM) seal.

SPECIFICATIONS

	ZJ6	SMLD 300	SMLD 300G
Operating pressure range	up to 8 bar	up to 20 bar	up to 50 bar
Life-time	up to 500 Mio. Cycles *1		
Viscosity range	1 - 400 mPa.s	1 - 200 mPa.s	1 - 1000 mPa.s *2
Maximum flow (water, 1 bar)	Nozzle Ø 0.15 mm: 11 ml/min Nozzle Ø 0.3 mm: 48 ml/min	Nozzle Ø 0.1 mm: 3.3 ml/min Nozzle Ø 0.15 mm: 8 ml/min Nozzle Ø 0.2 mm: 15 ml/min	Nozzle Ø 0.1 mm: 3.3 ml/min Nozzle Ø 0.15 mm: 8 ml/min Nozzle Ø 0.2 mm: 15 ml/min Nozzle Ø 0.3 mm: 38 ml/min Nozzle Ø 0.45 mm: 75 ml/min
Minimal dispensing volume	100 nl	below 10 nl possible	
Internal volume	37 µl	25 µl	65 µl
Nozzle diameter	Ø 0.15 mm | Ø 0.3 mm	Ø 0.1 mm Ø 0.15 mm Ø 0.2 mm	Ø 0.1 | Ø 0.15 | Ø 0.2 mm Ø 0.3 mm | Ø 0.45 mm Ø 0.6 mm
Valve stroke	Due to valve parameters	0.03 mm | 0.06 mm	0.03 mm | 0.06 mm 0.1 mm | 0.15 mm
Built-in filter	Filter 37 µm (on request)	Filter 17 µm (on request)	Filter 37 µm (on request)
Seal material	FKM | EPDM	Rubin	
Wetted materials	Saphir, PEEK, Stainless steel 316L and 1.4105 IL	Stainless steel types: 1.4305, 1.4301, 1.4310, 1.4113 IM / PEEK, Saphire	
Typical response time	400 µs *1	200 µs *1	400 µs *1
Maximum dispensing frequency	up to 1500 Hz *1	up to 4000 Hz *1	up to 3000 Hz *1
Weight	approx. 1.9 g	approx. 1.9 g	approx. 3.1 g
Repeat accuracy	< 2% at 5 µl water *1	< 5% CV *1	
Minimum pattern width	6.35 mm	4 mm	6 mm

*1 Depending on: Configuration, ambient condition and application
*2 With heating up to 15000 mPa.s (depending on the medium)

INLINE MICRO-JET VALVES – FAST-SWITCHING

Controllers

Micro-Jet Valve Controller

The valve controllers are available in three different versions

- MVC-1
- VC Mini
- ZC1

The ZC1 electronics has one channel and is intended as an OEM board for integration into a manufacturer's own device. The valve electronics ZC1 can be parameterised and controlled by using an RS-232 interface.

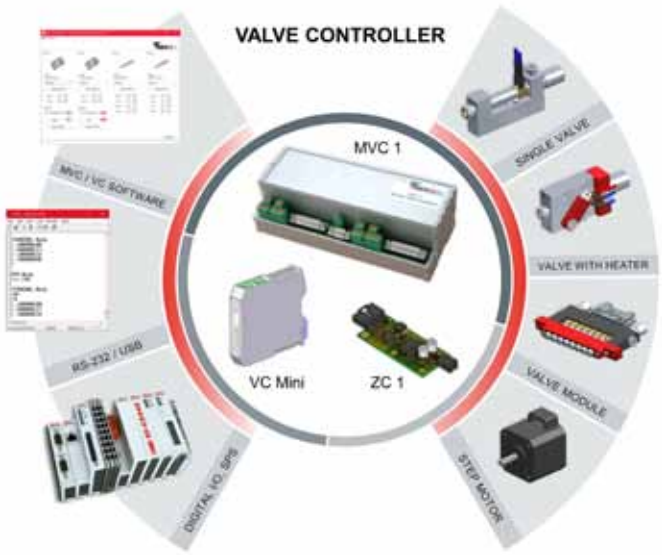
MVC-1 and VC Mini differ in the number of connections. Both controllers are configurable using an interface (RS232 or USB) via Java software or directly with command sets. The software allows easy operation of the valves and heating using a graphical user interface for programming and setting doses. The additional mode for external I/O signals allows the control of preconfigured settings.

The possible functions are:

- Single shot
- Open the valve
- Shot series
- Endless shot series
- Valve stop

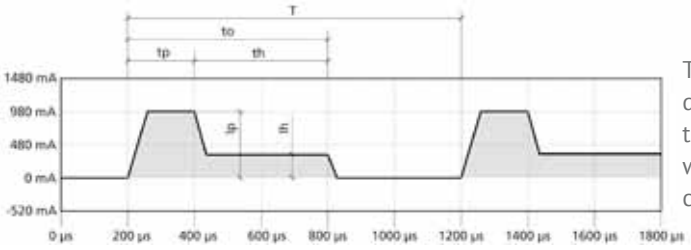
The following parameters can also be configured:

- Peak time **tp**
- Valve opening time **to**
- Cycle time **T**
- Peak current **Ip**
- Holding current **Ih**
- Number of shots



Electronic control

The best high-speed operation of the micro-jet valves is achieved by means of dual stage current triggering (Peak and Hold), i.e. a short actuation pulse at elevated current (Ip = 1A) effectuates an instantaneous response and a defined opening stroke of the valve. Once the valve is opened, reducing heat generation, a lower holding current (Ih = 200mA) is sufficient for proper operation during the residual cycle time.



This is a control example for continuously repeated dosing with a frequency of 1 kHz and a valve opening time of 600 µs. Electronic control example generated with the MVC-1 controller. Peak current 1A, holding current 200mA (**th** holding time).

INLINE MINIATURE SOLENOID VALVES

2/2-way NC

BMV Series - 7,5mm

AMV Series - 10mm

Application example with 3 inline miniature solenoid valves

These inline solenoid valves allow a pressure range of up to 10 bar on the inlet port.

Due to their small dimensions and the inline flow direction, these valves are ideally suited for size optimised fluidic installations.

Due to the design, the valves are free of dead volume and allow optimum flushability.

SPECIFICATIONS

	BMV 7,5mm	AMV 10mm
Type	2/2-way NC	
Port connection	Hose Barbs 2.6 mm | O-Ring	Hose Barbs | M3 male thread | O-Ring
Rated voltage	24 VDC	
Operating pressure range	0 - 10 bar	
Flow (at 8 bar using air)	54 l/min	90 l/min
Seal material	NBR | EPDM | VMQ | FKM	Silicone | NBR | FKM
Body material	Brass | Stainless steel	Reinforced polyamide with brass inserts | Stainless steel
Power consumption	1.9 W	2 W | 2.2 W
Operating duration	100% ED	
Weight	approx. 6.5 g	approx. 12 g
Outer dimensions	Ø7.5 x 37.85 mm - 39.15 mm (depending on the model)	Ø10.0 x 42.5 mm - 43.0 mm (depending on the model)

MINIATURE SOLENOID VALVES

2/2-way NC, 3/2-way
Orifice diameter 0.3 - 4.0 mm (DN)
Switching times in the millisecond range

Miniature solenoid valves

7mm micro valve

15mm micro valve

21mm micro valve

The flat-spring technology used in these valves enables switching times in the millisecond range, due to the low mass. Because of the frictionless movement of the anchor technology, up to 4 billion switching cycles are possible.

The 2/2-way and 3/2-way cartridge design valves enable compact integration in valve manifolds or complex fluidics modules. With outer diameters of only 7 mm, 15 mm and 21 mm, flow rates can be switched precisely in a small installation space.

SPECIFICATIONS

	7mm	15mm	21mm
Type	2/2-way NC | 3/2-way		
Port connection	Cartridge		
Outer dimensions	7 mm	15 mm	21 mm
Rated voltage	6 VDC | 9 VDC | 12 VDC | 24 VDC		
Orifice diameter	0.3 mm | 0.5 mm | 0.8 mm 1.0 mm	0.5 mm | 1.0 mm | 1.5 mm 2.0 mm	1.0 mm | 2.0 mm 3.0 mm | 4.0 mm
Operating pressure range	0 - 10 bar (due to orifice size)		
Seal material	NBR | FKM | EPDM | FFKM		
Max. ambient temperature	50°C		
Body material	Stainless steel (1.4305)		
Inner parts	Stainless steel (1.4310/1.4105)		
Power consumption	0.5 - 1.0 W	1.0 - 1.5 W	2.0 - 3.0 W
Operating frequency	max. 500/s	max. 200/s	max. 50/s
Response time	0.5 ms to 4.0 ms	1.0 ms to 5.0 ms	3.0 ms to 7.0 ms
Operating duration	100% ED		
Mounting direction	Any (preferred upwards)		
Weight	approx. 3 g	approx. 22 g	approx. 60 g

MINIATURE SOLENOID VALVES

2/2-way NC, 3/2-way
Fast switching times
High flow rates

CSV 10mm

CSV 12mm

2/2-way and 3/2-way compact valves with high flow rates of up to 40 l/min (10mm valve at 2 bar) or 125 l/min (12mm valve at 2 bar). The valves are pressure balanced and allow a maximum pressure of up to 2 bar on all connections. Fast switching times enable precise control of air, oxygen and inert gases. Optionally, the valves can be supplied with an electrical connector and 30 cm cable.

SPECIFICATIONS

	CSV 10mm	CSV 12mm
Type	2/2-way NC | 2/2-way NO | 3/2-way	
Port connection	Cartridge	
Media	Air, Oxygen, Inert gases	
Rated voltage	12 VDC | 24 VDC	
Flow rate (at 2 bar)	40 l/min (0.075 Cv)	125 l/min (0.20 Cv)
Operating pressure range	0 - 2 bar (each connection)	
Seal material	NBR | (optional FKM)	
Ambient temperatur range	0 - 52°C	
Body material	Acetal, LCP	
Inner parts	Stainless steel	
Power consumption	2.0 W	5.0 W
Response time	10 ms ON, 6 ms OFF	9 ms ON, 5 ms OFF
Operating duration	Intermittent (Continuous with hit-and-hold operation)	
Weight	approx. 11 g	approx. 19.5 g
Dimensions	9.9 mm x 23.22 mm - 38.3 mm	11.99 mm x 24.28 mm - 42.16 mm

MINIATURE SOLENOID VALVES

3/2-Wege bistabil, 3/2-Wege
Hoher Druckbereich auf allen Anschlüssen

L310 - 3-Wege Magnetventil bistabil

HK5 - 12,6 mm 3-Wege Magnetventil

SPECIFICATIONS

	L310	HK5
Druckbereich	950 mbar - 8.6 bar	-0,.5 bar - 6.8 bar (NBR & HNBR Dichtung) -0.95 bar - 4.1 bar (EPDM & FKM Dichtung) -0.95 bar - 2.0 bar (HKL5)
Umgebungstemperatur	0 - 50°C	0 - 50°C (NBR) 0 - 100°C (FKM) 0 - 80°C (EPDM | HNBR)
Betriebsspannung	12 VDC | 24 VDC (+/- 10 %)	4,5 VDC | 12 VDC | 24 VDC
Cv	0,24	85 l/min bei 6.9 bar (0.05 Cv) 42 l/min bei 4.13 bar (0.35 Cv) (Low-Power-Option)
Dichtung	Buna (optional: FKM)	NBR | HNBR | EPDM | FKM
Mediumberührte Werkstoffe	Messing, Aluminium, Edelstahl, Acetal	Duroplast-Epoxy, Peek®, 304 und 303 Edelstahl. HKL5: Schaft aus Edelstahl 316
Anschlüsse	1/8“ NPT | G 1/8“ | R 1/8“	Manifold
Leistungsaufnahme	12 W (beim Umschalten)	1.7 W (Standard) 0.9 W (Low-Power-Option)
Betriebsart	10% ED	100% ED
Gewicht	approx. 114 g	approx. 35 g

MINIATURE PROPORTIONAL VALVES

2/2-way
Orifice diameter 0.3 - 4.0 mm (DN)
Small, precise, with a very long life-time

Miniature proportional valves

8mm micro proportional valve

15mm micro proportional valve

21mm micro proportional valve

The miniature proportional valves for neutral liquids and gases are characterised by optimal use of the smallest installation spaces, a very long service life and high accuracy. These valves enable a stepless and fine control of the flow with high accuracy and repeatability.

SPECIFICATIONS

	8mm	15mm	21mm
Type	2/2-way proportional valve		
Port connection	Cartridge		
Outer dimensions	8 mm	15 mm	21 mm
Rated voltage	12 VDC | 24 VDC		
Orifice diameter	0.3 mm	0.5 mm | 1.0 mm | 1.5 mm 2.2 mm	2.0 mm | 4.0 mm
Operating pressure range	0 - 10 bar | 0 - 6 bar	0 - 10 bar (due to orifice size)	
Seal material	FFKM	FKM	FKM | EPDM | FFKM
Max. ambient temperature	50°C		
Body material	Stainless steel (1.4305)		
Inner parts	Stainless steel (1.4310/1.4105)		
Operating duration	100% ED		
Mounting direction	Any (preferred upwards)		
Weight	approx. 4.9 g	approx. 23 g	approx. 61 g

MINIATURE PROPORTIONAL VALVES

Flowrate up to 300 ml/min
Excellent resolution with low hysteresis

PV3 & PV10 Series

PC30 Series

SPECIFICATIONS

	PV3	PV10	PC30
Type	2/2-way proportional valve		
Connection	10-32UNF | M5 | Manifold		1/4“ NPSF | Manifold
Rated voltage	12 VDC | 24VDC		10 VDC | 20 VDC
Operating current range	0 - 200 mA (12 VDC) 0 - 100 mA (24 VDC)	0 - 400 mA (12 VDC) 0 - 200 mA (24 VDC)	0 - 525 mA (10 VDC) 0 - 285 mA (20 VDC)
Orifice diameter	0.8 mm (Other on request)	2.0 mm (Other on request)	4.0 mm | 4.8 mm 6.35 mm (Other on request)
Max. flow rates	30 l/min	75 l/min	300 l/min
Max. pressure	1.7 bar | 3.4 bar | 5.2 bar | 6.9 bar (depending on orifice diameter)		1.7 bar | 3.4 bar | 6.9 bar (depending on orifice diameter)
Seal material	FKM		
Other wetted materials	ENP Brass, SST, Nickel plated		Aluminium, ENP Brass, SST, Nickel plated steel
Max. ambient temperature	0 - 52°C		
Operating duration	100% ED		
Mounting direction	Any (preferred upwards)		
Weight	approx. 93 g		approx. 408 g
Dimensions	Ø22.2 x 41.0 mm (10-32UNF | M5) Ø22.2 x 36.7 mm (Manifold)		Ø46.23 x 83.06 mm (1/4“ NPSF) Ø46.23 x 72.14 mm (Manifold)

PIEZO PUMPS

3 ml/min, 7 ml/min, 20 ml/min, 30 ml/min
COC & EPDM

SDMP Series

Their small and thin design, as well as their low weight, are just a few advantages of piezo pumps. Because of their quiet operation and very low power consumption, new possibilities in fluidics are revealed. By changing the voltage (stroke) and frequency, a large flow range can be covered - from a few µl up to ml.

SDMP302

SDMP306


SDMP320

SPECIFICATIONS

	SDMP302/302D	SDMP306/306D	SDMP320	SDMP330W (under development)
Flow rate	max. 3 ml/min	max. 7 ml/min	max. 20 ml/min	max. 30 ml/min
Operating pressure	400 mbar	450 mbar	350 mbar	350 mbar
Suction load pressure	-10 mbar (Self-priming)			
Port connection (hose barbs)	OD 1.2 - ID 0.6 L 2.5 mm	OD 2.2 - ID 1.2 L 3.2 mm	OD 2.8 - ID 1.6 L 5.0 mm	OD 2.8 - ID 1.6 L 5.0 mm
Rated voltage	60 - 250 Vp-p 10 - 60 Hz 5 VDC (302D | 306D)		60 - 250 Vp-p 10 - 60 Hz	
Wetted materials	COC and EPDM			
Fluid temperature range	5 - 50°C			
Ambient temperature range	5 - 50°C			
Weight	approx. 4 g (302) approx. 7 g (302D)	approx. 4 g (306) approx. 7 g (306D)	approx. 9 g	approx. 12 g
Power consumption	20 mW (at 40Hz) 29 mW (at 60Hz)	22 mW (at 40Hz) 32 mW (at 60Hz)	32 mW (at 40Hz) 48 mW (at 60Hz)	64 mW (at 40Hz) 96 mW (at 60Hz)
Outer dimensions	25.0 x 25.0 x 4.8 mm (302 | 306) 25.0 x 25.0 x 8.9 mm (302D | 306D)		33.0 x 33.0 x 3.5 mm	33.0 x 33.0 x 5.5 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different port connections,...)

PIEZO PUMPS

15 ml/min (higher flow rate with double stack)
Highly inert (PEEK & Perfluoroelastomer FFKM)

Cartridge type piezo pump

The cartridge type piezo pump is a special line in our piezoelectric micropump series. An integrated magnet mechanism allows the easy and safe changing of cartridges. It is possible to sterilise the cartridge before changing it, which makes these pumps suitable for new applications in analytic systems.

The well-known characteristics of piezo pumps are also valid for this special type.

MPD-200A

The MPD-200A is a compact driver board. It is a high voltage circuit board, specifically developed for piezoelectric micropumps. It generates the necessary output voltage of 250 Vp-p. 40 Hz to operate the pump from a 5 VDC input voltage.

MPC-200A

The MPC-200A is a compact controller, which generates the necessary output voltage to operate the piezo pumps. This controller comes with a user-friendly digital display for configuration and is equipped with a memory function.

APP-20KG - Highly Inert

DOUBLE PIEZO STACK | OPTIONAL

With highly inert wetted materials such as PEEK and Perfluoroelastomer (FFKM), this small, thin and lightweight piezo pump opens up new possibilities for pumping aggressive media. With the optional double piezo stack, improved values can be achieved in the area of suction and output pressure as well as flow rate.

SPECIFICATIONS

	APP-20KG
Flow rate	15 ml/min *(higher flow rate with double stack)*
Operating pressure	250 mbar *(higher pressure with double stack)*
Suction load pressure	-10 mbar (Self-priming) *(higher suction load pressure with double stack)*
Port connection (hose barbs)	OD 2.8 - ID 1.6 L 5.0 mm
Rated voltage	60 - 250 Vp-p 10 - 60 Hz
Wetted materials	PEEK and Perfluoroelastomer (FFKM) (Optional: PPS and FPM)
Ambient- & fluid temperature range	5 - 50°C
Weight	approx. 17 g
Power consumption	32 mW (40 Hz) | 48 mW (60 Hz) (double performance using double stack)
Outer dimensions	33.0 x 33.0 x 9.0 mm

Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different port connections, ...)

MINIATURE DIAPHRAGM PUMPS FOR LIQUIDS

Flow rate of 500 ml/min

DAP Series

DBP Series

The self-priming diaphragm pumps of the DAP and DCP series with flow rates of 500 ml/min and operating pressure ranges from -600 to 1000 mbar offer several advantages.

The DAP model enables approximately 20% higher flow rates than comparable pumps of the same size, even with higher pressure. Compared to the DAP series, the DCP pumps have a longer life-time.

Due to the compact size of the DCP model, the pump is smaller than other pumps with comparable flow rates.

SPECIFICATIONS

	DAP Series	DCP Series
Motor	DC motor	DC motor brushless
Flow rate (max.)*	500 ml/min	
Discharge pressure (max.)	1000 mbar	
Vacuum pressure (max.)	-600 mbar	
Fluid temperature range	5 - 80°C	
Ambient temperature range	5 - 40°C	
Rated voltage	12 VDC | 24 VDC	
Power consumption	8 W	4 W
Port connection	Hose Barbs	
Wetted materials	PP | EPDM (Optional FPM)	
Weight	approx. 168 g	approx. 195 g
Outer dimensions	31 x 55.2 x 85.6 mm	31 x 55.2 x 81.9 mm

* At 0 bar back pressure

METERING PUMPS

Dosage von 5 - 500 µl/stroke

Metering pumps

The dosing range of these metering pumps can be adjusted using a setscrew. Due to a wide selection of wetted materials, the dosage of aggressive liquids is possible.

MCP Series

MLP Series

PKP Series

SPECIFICATIONS

	MCP Series	MLP Series	PKP Series
Dosing volume	5 - 50 µl	10 - 200 µl	50 - 500 µl
Repeat accuracy	±1% (15 - 50 µl) ±2% (5 - 15 µl)	±1%	±1%
Frequency	4 Hz	1 Hz	2 Hz
Port connection	M6 | 1/4-28UNF		
Wetted materials	PTFE and FPM POM and FPM PP and FPM PP and EPDM	PTFE and FPM POM and FPM PP and FPM	POM and FPM POM and Silicone PP and FPM PP and Silicone PP and EPDM
Rated voltage	12 VDC | 24 VDC		
Power consumption	4.4 W	5.9 W	10 W
Fluid temperature range	10 - 40°C		
Ambient temperature range	10 - 40°C		
Outer dimensions	30.0 x 26.0 x 63.5 mm	36.0 x 50.0 x 70.0 mm	36.0 x 43.0 x 78.0 mm

MINIATURE SYRINGE PUMPS

Highly accurate dosing of nl & µl

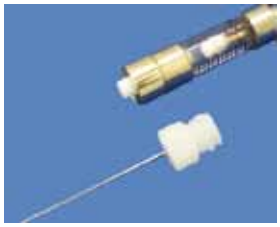
SBP Series

This miniature syringe pump has dimensions of only Ø12 × L170 mm with an integrated 2-phase stepper motor and reduction gear. A large number of available connections enable a wide range of options for the varied applications of our customers.

On request, we also offer a miniature 3/2-way valve, which can be attached to the pump head of this miniature syringe pump.

All these features make this pump well suitable for microfluidic applications and mobile devices.

The miniature syringe pumps can be mounted directly on a movable arm. A needle can be attached directly below the pump, reducing the air gap between the syringe and the sample to a minimum. This leads to higher accuracy.



SPECIFICATIONS

	SBP Series
Syringe capacity	100 µl
Theoretical resolution	0.105 nl (with 1/100 micro-step) 10.5 nl (with fullstep)
Wetted materials	Glass, PTFE, PVDF, Stainless steel (Needle)
Port connection	Needle | Luer | M6 (male | female) | 1/4-28UNF (male | female) Adapter for disposable tip (Eppendorf® epT.I.P.S., 2-200 µl)
Fluid temperature range	15 - 40°C
Ambient temperature range	15 - 40°C
Outer dimensions	Ø12 × L170 mm (excluding needle and sensor)

MINIATURE SYRINGE PUMPS

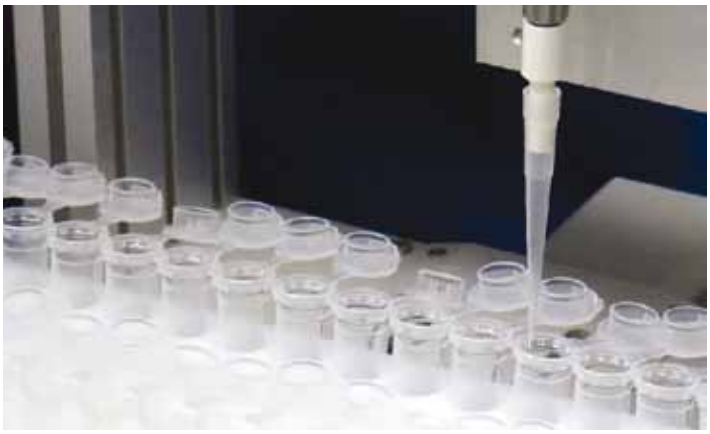
100 µl, 500µl or 1000 µl syringe capacity

SCP Series

These syringe pumps are equipped with a 2-phase bipolar stepper motor and impress with their small design of only 26 x 42 x 120 mm with capacities from 100 µl to 1000 µl.

Compared to other pumps of this size, these syringe pumps have no dead volume. In addition, they are smaller and lighter than conventional syringe pumps.

Dosing rates from 16.6 µl/s to 166 µl/s ensure a wide range of applications and the integrated sensor makes it possible to detect the starting position.



SPECIFICATIONS

	SCP Series
Syringe capacity	100 µl | 500 µl | 1000 µl
Theoretical resolution	83 nl/pulse | 415 nl/pulse | 830 nl/pulse
Repeat accuracy	CV < 1% (full stroke)
Port connection	M6 | 1/4-28UNF
Wetted materials	Glass, PTFE, PEEK
Fluid temperature range	5 - 40°C
Ambient temperature range	5 - 40°C
Outer dimensions	26 x 42 × L120 mm
Motor	2-Phases bipolar-stepper motor
Mounting direction	Any

MINIATURE PERISTALTIC PUMPS

Ring Pump principle
Pumping and dosing in the nl & µl - range

RP-TX

(exchangeable pump head)
(optional: pump head sterilizable)

RP-QII & RP-QIII Stepper

RP-HX

(exchangeable pump head)
(optional: pump head sterilizable)

These miniature peristaltic pumps are the smallest of their size worldwide and offer flow rates from 0.03 µl/min (RP-TX).

Equipped with a stepper motor, the RP-TX and RP-HX series offer a large flow range. The exchangeable pump heads with an integrated tube enable easy maintenance. The pump heads are optionally available as autoclave sterilizable versions. Because of these characteristics, these pumps are especially suitable for compact or mobile applications, as well as for microfluidic uses.

SPECIFICATIONS

	RP-TX Series	RP-HX Series	RP-QII & RP-QIII Stepper
Motor	Stepper motor		
Flow rate	0.03 - 40 µl/min (Silicone) 0.03 - 35 µl/min (Olefine)	2 - 400 µl/min (Silicone) 5 - 1000 µl/min (Silicone) 2 - 350 µl/min (Olefine)	0.06 - 60 µl/min 0.18 - 180 µl/min 0.35 - 350 µl/min 1.2 - 1100 µl/min
Operating pressure (max.)	300 mbar	500 mbar	500 mbar
Tubing materials	Silicone | Olefine		Pharmed® | Silikon
Tubing diameters (ID)	0.5 mm	0.5 mm | 1.0 mm	0.5 mm | 1.5 mm
Power consumption	0.35 W	0.62 W	0.69 W
Rated voltage	3 VDC	3 VDC	2.6 - 3.3 VDC
Weight	approx. 9.1 g	approx. 31 g	approx. 15 g
Outer dimensions	33.0 x 12.0 x 21.5 mm	32.0 x 20.0 x 46.0 mm	15.0 x 17.0 x 28.0 mm

MINIATURE PERISTALTIC PUMP

Ring Pump principle
RP-Q series in a compact design

RP-Q1

RP-QX

RP-QII & RP-QIII

The tube is integrated in the compact pumps RP-Q1 and RP-QX. These pump series offer flow rates of up to 1.1 ml/min with the smallest design.

The pump heads of the RP-QII and RP-QIII series are easily exchangeable via a clip system and deliver up to 3.0 ml/min. Furthermore, the RP-QIII has side mounting options to attach the pump head directly on the housing.

SPECIFICATIONS

	RP-Q1 Series	RP-QX Series	RP-QII Series	RP-QIII Series
Motor	DC brush motor			
Flow rate	0.2 ml/min (Norprene® | SWFT) 0.45 ml/min (Silicone)	0.5 ml/min (Norprene® | SWFT) 1. 1 ml/min (Silicone)	0.45 ml/min | 1.2 ml/min (Norprene®) 0.85 ml/min | 2.2 ml/min | 3.0 ml/min (Silicone)	
Operating pressure (max.)	500 mbar			
Tubing materials	Norprene® | Silicone | SWFT		Norprene® | Silicone	
Tubing diameters (ID)	1.2 mm (Norprene®) | 1.2 mm (SWFT) | 1.5 mm (Silicone)			
Power consumption	0.36 W | 0,48 W (RP-QII - RP-QIII with 3ml/min)			
Rated voltage	3 VDC			
Weight	approx. 11 g			approx. 13 g
Outer dimensions	11.9 x 13.9 x 30.0 mm		15.0 x 17.0 x 32.2 mm	24.3 x 17.0 x 32.2 mm

MINIATURE PERISTALTIC PUMP

Ring Pump principle
6-channel miniature peristaltic pump

RP-CIII

RP-6R0 - DC

RP-6R0 - STEPPER

With the RP-CIII series the pump head with tube can be exchanged. This is possible with the RP-CIII via a snap mechanism. Through using durable tubes like Norprene® and Pharmed® these pumps are suitable for a wide range of liquids.

The DC version of the 6-channel peristaltic pump with dimensions of only 84.0 x 31.0 x 32.0 mm achieves flow rates of 0.8 ml/min per channel. The stepper driven version has a flow range from 0.23 µl/min to 350 µl/min per channel. The replacement of the silicone tubes can easily be done without tooling for both versions using a sliding mechanism.

SPECIFICATIONS

	RP-CIII Series	RP-6R0 - DC	RP-6RO - Stepper
Motor	DC geared motor		Bipolar stepper motor
Flow rate	1.6 ml/min (3 VDC) 2.8 ml/min (5 VDC)	approx. 0.8 ml/min each channel	approx. 0.23 - 350 µl/min each channel
Channels	1	6	
Operating pressure (max.)	300 mbar		
Tubing materials	Silicone | Pharmed® Fluran®	Silicone (other tube materials on request)	
Tubing diameters (ID)	1.6 mm	1.0 mm	
Power consumption	0.36 W (3 VDC)	0.36 W	0.65 W (at 180 mA) 2.45 W (at 350 mA)
Rated voltage	3 VDC | 5 VDC	3 VDC	10 VDC
Weight	approx. 30 g	approx. 67 g	approx. 85 g
Outer dimensions	44.5 × 33.4 × 26.0 mm	31.0 x 32.0 x 84.0 mm	

PERISTALTIC PUMPS

Ring Pump principle
High flow rate in a compact housing

RP-GIII

RP-GII

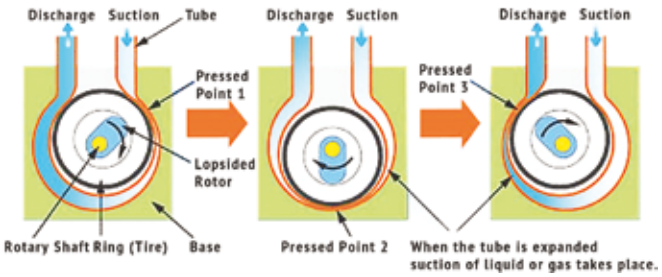
RP-2GII

SPECIFICATIONS

	RP-GIII Series	RP-GII Series	RP-2GII Series
Motor	DC geared motor		
Flow rate	5,0 | 12 (Silicone) 2,5 | 4,5 | 6,5 | 10 (PharMed®) 3,2 | 8,0 (Fluran®) 3,0 | 7,0 (TM-15)	12 | 17 | 25 | 40 (Silicone) 10 | 25 (PharMed®) 20 | 45 (Norprene®) 12 | 25 (TM-15)	25 | 30 | 50 | 70 (Silicone) 20 | 50 (PharMed®) 80 (Norprene®) 20 | 50 (TM-15)
Operating pressure (max.)	500 mbar		
Tubing diameters (ID x OD)	1.6 x 3.2 mm | 2.0 x 4.0 mm	2.0 x 4.0 mm | 2.0 x 4.2 mm | 2.5 x 4.5 mm | 2.8 x 4.8 mm	
Power consumption	1.8 W	1.8 - 4.0 W	
Rated voltage	3 VDC | 6 VDC	12 VDC | 24 VDC	
Weight	approx. 62 g	approx. 90 g	approx. 115 g
Outer dimensions		27.0 x 47.5 x 74.0 mm	

Ring Pump peristaltic pumps

The Ring Pumps work with a single, eccentrically rotating ring that squeezes the tube in the middle, which significantly minimises the load on the tube. Due to the gentle movement of the ring the service life of the tube is also increased compared to standard peristaltic pumps, so that maintenance intervals can be extended. A special lubricant, applied between the tube and the housing, as well as the insertion of elastic materials on the ring, reduce further friction to maximise the service life of the tube.



Advantages of the Ring Pump principle:

- Peristaltic pumps can be built in very small dimensions.
- Flow rate of nanolitres up to a few litres per minute.
- Peristaltic pumps with tube operating times of up to 5,000* hours are possible during continuous operation.
- Low noise versions.
- Because of different tube materials different chemicals can be pumped.

* depending on the pump model, tubing material, operating duration, operating conditions and fluid.

PERISTALTIC PUMPS

Ring Pump Prinzip
Pumps with long tube life time

RP-M

RP-KII

RP-WII

RP-S

RP-2S

SPECIFICATIONS

	RP-M	RP-KII	RP-WII	RP-S	RP-2S
Motor	DC geared motor				
Flow rate	5 ml/min 10 ml/min 20 ml/min 30 ml/min 50 ml/min 65 ml/min	50 ml/min 100 ml/min 150 ml/min 200 ml/min 250 ml/min	350 ml/min 500 ml/min	500 ml/min 700 ml/min 800 ml/min	1000 ml/min 1400 ml/min 1600 ml/min
Operating pressure (max.)	500 mbar				
Tubing materials	Silicone PharMed® TM-15 SWFT	Silicone Norprene® TM-15	PharMed®	Norprene® PharMed® TM-15	
Tubing diameters (ID x OD)	2.0 x 4.0 mm 3.0 x 5.0 mm 3.9 x 5.8 mm 4.0 x 6.0 mm	4.8 x 8.0 mm 6.5 x 9.9 mm 6.35 x 9.52 mm	4.0 x 8.0 mm	6.35 x 9.52 mm 7.00 x 10.00 mm	
Rated voltage	24 VDC				
Weight	approx. 260 g	approx. 115 g	approx. 850 g	approx. 650 g	approx. 900 g
Outer dimensions (pump head)	74.0 x 24.8 x 74.5 mm	79.0 x 29.6 x 100.0 mm	82.0 x 48.3 x 148.3 mm	81.0 x 28.1 x 108.0 mm	81.0 x 54.6 x 108.0 mm

ELECTRO-OSMOTIC PUMPS
ULTRA-SMALL PERISTALTIC PUMPS
CHIP PUMPS

Electro-osmotic pumps

The electro-osmotic pumps are extremely small in design (Ø12.0 x 17.6 mm) and use the electro-osmotic effect to generate a flow. In addition to their small size, they are characterised by pulsation-free and silent pumping, since the pumping principle does not require any mechanically moving parts.

A high output pressure of up to 10 bar (at 150 VDC) is also possible and the flow rate can be controlled in proportion to the applied voltage. Due to its very low power consumption, this type of pump is suitable for battery-operated applications.

Flow rate (max.)	approx. 10 µl/min bei 24VDC, 60 µl/min at 150 VDC proportional to the voltage
Pressure	approx. 10 bar (at 150 VDC - demineralized water)
Directly usable liquids	Deionized water (demineralized water) Methanol | Ethanol Other liquids can be pumped indirectly
Outer dimensions	Ø12 x 17.6 mm

Ultra-small peristaltic pumps

With a minimal size of only 14x 38x 13 mm these pumps are especially suitable for portable insulin systems.

Due to a low power consumption - these pumps can be operated with batteries.

The only wetted material is the tube in the pump head.

Motor	DC Motor	Stepper Motor
Flow rate	50 µL/min	35 µL/min
Tubing diameters	I.D. 0.5 x O.D. 1.0 mm	
Outer dimensions	14 x 38x 13 mm	16 x 19 x 16 mm
Remarks	Built-In Rotation Position Sensor	

Chip pumps

This system integrates a peristaltic pump into a PDMS chip. The liquid inside the channels of the chip is moved by the rollers squeezing the fluidic channels, similar like a peristaltic pump.

The PDMS chips are interchangeable, sterilisable and are manufactured according to customer specifications.

SHAPE MEMORY ALLOY PUMPS

Dosing of 2 µl/stroke | 6 µl/stroke

SP-100

SP-300

These dosing pumps are driven by a shape memory alloy and are designed for two dosing volumes.

The diaphragm separated miniature pump series are characterised by their compact design, very low weight and low power consumption.

SPECIFICATIONS

	SP-100 (under developement)	SP-300
Flow rate	2 µl/stroke	6 µl/stroke
Pressure (max.)	50 mbar	
Port connections	Hose Barbs	
Wetted materials	PP | EPDM (Optional FPM)	
Electrical supply	250 mA	200 mA
Frequency (max.)	1 Hz	0.75 Hz
Fluid temperature range	5 - 40°C	
Ambient temperature range	5 - 40°C	
Weight	-	approx. 6 g
Dimensions	5.0 x 15.0 x 20.5 mm	6.0 x 16.0 x 41.2 mm

PISTONS PUMPS

100 µL / shot, 200 µL / shot, 300 µL / shot
Discharge Accuracy < 0,5%

CAP Series

The rotary piston pumps have a high repeatability of only 0.5%, therefore they are a very precise solution for liquid dosing.

Due to the piston system the pumping of high viscous media is possible.

The wetted materials PVDF, PTFE and Ceramics have a high chemical resistance.

With liquid volumes of 100 µl, 200 µl and 300 µl per shot, the smallest amounts can be dosed continuously.

SPECIFICATIONS

	100 µL/shot	200 µL/shot	300 µL/shot
Discharge Accuracy	CV < 0,5 % *		
Speed Range	5 ~ 300 RPM		
Discharge Pressure	1.50 bar		
Fluid Temperature	0 - 60°C		
Ambient Temperature	0 - 40°C		
Motor	2-phase bipolar stepping motor		
Related Voltage	24 VDC		
Port Connection	M6 | 1/4 -28UNF		
Wetted Materials	PVDF, PTFE, Ceramic		

*Tested under 100 RPM, 10 stroke withoutback pressure

MINIATURE DIAPHRAGM PUMPS FOR GASES

V100 Black Edition - 200 ml/min
Long life-time up to 35000 hours

V100 Series

With dimensions of just 15 x 15 x 25 mm and an operating life of over 20 000 hours, this intelligent diaphragm pump is a compact solution for applications in medical technology or gas analysis. Because the pump can also be operated with a battery, solutions in small portable devices are possible.

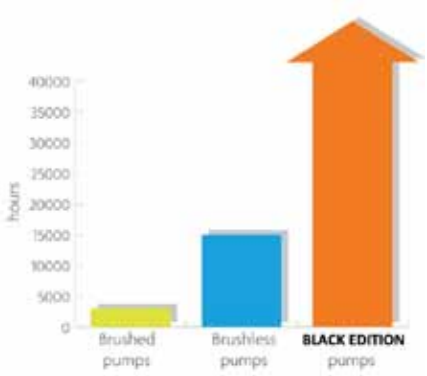
With an integrated ARM processor this pump offers independent control options, as well as the reduction of external components to make systems even smarter and more compact. The pump can be paired with an additional Wi-Fi module, which opens up new possibilities e.g, IoT applications.

SPECIFICATIONS

	V100
Flow rate (max.)	200 ml/min
Vacuum pressure (max.)	300 mbar
Wetted materials	PPS & EPDM (on request)
Electrical interface	5 wires cable (Molex 53047 picoblade)
Communication type	Analog Flow Control | I²C-Interface
Rated voltage	5 VDC | 12 VDC
Life-time	20000 hours

Intelligent diaphragm pumps - BLACK Edition

Thanks to the integrated electronics, the lifespan of the BLACK Edition is **over 35000 operating hours**. It also comes with a **3-year warranty**, combined with new cost saving control options. The pump electronics transfer the operating voltage into piston stroke movements with flow range depending on the frequency.



The integrated interface makes it possible to read data and set control signals for the micropump. This enables very precise regulation of the pump and the possibility of saving additional electronics.

Examples:
- Calibrated flow rate
- Constant frequency regardless of back pressure
- Constant flow rate with fluctuating operating voltage
- Monitoring of pressure / vacuum

MINIATURE DIAPHRAGM PUMPS FOR GASES

Black Edition & Orange Edition - up to 1300 ml/min
Long life-time up to 35000 hours

P200 / V200 Series | P1500 / V1500 Series

Intelligent miniature diaphragm pumps: Through integrated electronics the BLACK Edition offers new control options.

SPECIFICATIONS

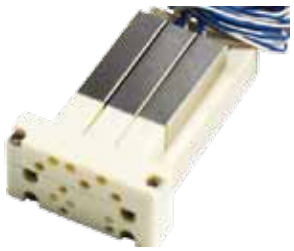
	ORANGE Edition P200 / V200	ORANGE Edition P1500 / V1500	BLACK Edition P200 / V200	BLACK Edition P1500 / V1500
Flow rate (max.)	300 ml/min (P200) 300 ml/min (V200)	1200 ml/min (P1500) 900 ml/min (V1500)	400 ml/min (P200) 400 ml/min (V200)	1300 ml/min (P1500) 1000 ml/min (V1500)
Vacuum pressure (max.)	-150 mbar (P200) -300 mbar (V200)	-150 mbar (P200 / P1500) -350 mbar (V200 / V1500)		
Operating pressure (max.)	350 mbar (P200 / P1500) 150 mbar (V200 / V1500)			300 mbar (P1500) 150 mbar (V1500)
Electrical interface	2 wires cable		Flex cable (MOLEX 52610 | 52271) 3 wires cable 5 wires cable (MOLEX 53047 picoblade)	
Communication type	-		Analog Flow Control | I^2C-Interface Serial Interface (RS-232) (not with 3 wires cable)	
Other wetted materials	PPS & EPDM | Viton | Kalrez / Simris (Other materials on request)			
Recommended tubing diameter (ID) *	1.6 to 2.8 mm	2.8 to 3.8 mm	1.6 to 2.8 mm	2.8 to 3.8 mm
Flow media	Air & gases			
Fluid temperature range	0 - 55°C			
Ambient temperature range	0 - 55°C			
Rated voltage	5 VDC | 12 VDC	12 VDC | 24 VDC	5 VDC | 12 VDC 24 VDC	12 VDC | 24 VDC
Weight	approx. 40 g	approx. 108 g	approx. 40 g	approx. 108 g
Life-time	5000 hours		up to 35000 hours	

* depending on the tube material
Customisable to specific requirements (e.g. higher pressure range, different operating mode, higher temperature range, different operating voltage, different port connections, ...)

MINIATURE COMPONENTS & MODULES FOR THE FLUID TECHNOLOGY

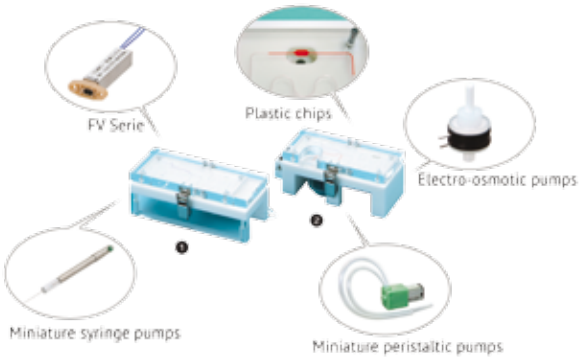
Smallest dimensions with the best possible performance

Use our experience to integrate fluidic components in your microfluidic application. Talk to us at the concept stage of your systems so that we can help you design and select the appropriate components as adequately as possible.



Starting with the design to finished prototypes, we and our partners will fully support you with our knowledge and we are happy to assist you with our manufacturing possibilities.

Example-modules



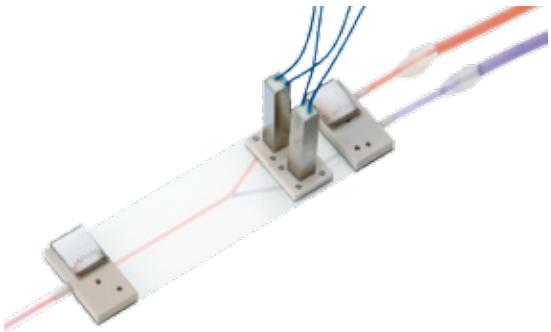
1. In this module, a plastic chip is pre-filled with a reagent.

This module consists of the following components:

- *Plastic chip (see page 53)*
- *Miniature syringe pump (see page 42)*
- *Ultra-miniature diaphragm isolation solenoid valve (see page 4)*

2. The basic analysis processes are shown in this module. Starting with injecting the sample, as well as mixing with the reagent until detection. A plastic chip with Y channels is used here.

The sample is supplied by a miniature peristaltic pump and is mixed via an electroosmotic pump with the pre-filled reagent. The chip was developed as a disposable chip and can be easily changed at the module.



This module consists of the following components:

- *Plastic chip (see page 53)*
- *Miniature peristaltic pump (see page 44)*
- *Electro-osmotic pump (see page 57)*

3. In this module, the supply and mixing of two liquids on a film chip of only 225 µm in thickness is realised. The mixing ratio can be controlled directly by controlling the flanged ultra-miniature solenoid valves.

- *Film chip (see page 53)*
- *Ultra-miniature diaphragm isolation solenoid valve (see page 4)*

FLUIDIC CHIPS

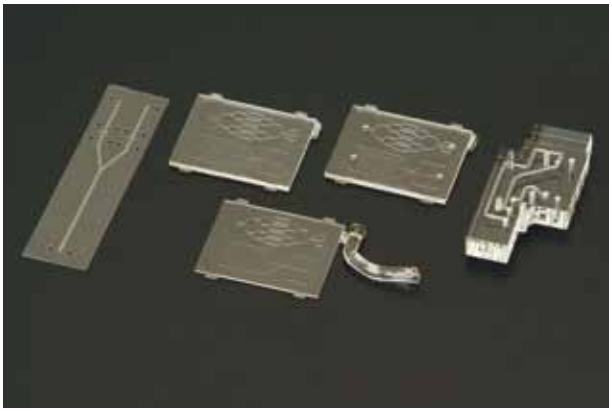
Microfluidic chips made of various materials
Plastic chips, PDMS chips & flexible film chips

Plastic chips

For lab-on-a-chip systems, our partners use the injection moulding process to produce high-quality and inexpensive chips, which can be used as disposable chips in mass production environments due to their attractive price. The minimum channel size is 50 µm in cross-section, whereby the channel pattern can be designed freely.

The materials include COC (cyclic olefin copolymer), PMMA (acrylic), PI (polyimide), PEN (polyethylene naphthalate), PC (polycarbonate), PS (polystyrene), ceramic, and many more, all provide optimal optical properties. Of course, the processing of other materials according to customer requirements is possible.

Thanks to a special composite technology, no adhesive is used with these chips, so that the fluidic channels remain free of contamination.



PDMS chips

PDMS chips can be manufactured mechanically for prototypes and inexpensively in series using the injection moulding process.

Flexible film chips

Flexible solutions for microfluidic applications.

These film chips are made up of several flexible layers, manufactured by foil connections, in which microchannels are processed. Components such as pumps and valves can be directly attached to the chip, which remains flexible. The film can be tempered very easily on the one hand and on the other hand it can be used in unusual forms.

The materials available for the film layers are:

- Chemically-inert Polyimide (PI)
- COC (Cyclic olefin copolymer)
- Polyethylene naphthalate (PEN)

Channel size (min.)	50 µm
Layer thickness (1 Layer)	25 µm | 50 µm | 75 µm

FLOW SENSORS

Flow sensor for liquids - differential pressure principle

Flow sensors

- With USB connection for quick evaluation, or as compact version for space-saving integration with RS232 interface and digital output interface
- Continuous sampling at 100Hz
- Volume flow measurements for up to 15 ml/min, 30 ml/min or 100 ml/min
- Measurement of dispensing volumes from 20 µl
- For water, oil and other low-viscosity media (up to 100 mPas)
- Not susceptible to gas bubbles
- Short response time

SPECIFICATIONS

	V-15 | V-Mini-10	V-30 | V-Mini-30	V-100 | V-Mini-100
Flow rate	0 - 15 ml/min	0 - 30 ml/min	0 - 100 ml/min
Calibrated flow rate	1 - 15 ml/min	3 - 30 ml/min	10 - 100 ml/min
Operating pressure	0 - 1.8 bar (absolut)		
Over pressure	4 bar (absolut)		
Burst pressure	6 bar (absolut)		
Working temperature	10 - 50°C		
Flow detection response time	10 ms		
Restrictor orifice diameter	200 µm	300 µm	500 µm
Connectors	¼-28 UNF flat bottom (Other connectors on request)		
Wetted materials	PEEK, FPM, 1.4301 stainless steel, fluorosilicone		
Dimensions	72 x 40 x 15 mm		
Weight	20 g		
Accuracy of volume flow	< ± 2 %		
Communication interface	RS232, RS-485, USB		
Sampling rate	100 Hz		
Readout interval	0.01 - 100 s		
Voltage	5 VDC		
Power consumption	< 50 mA (Standby)		

LSPONE

High precision without dead volume for experiments in microfluidics

Microfluidic syringe pump

The LSPone laboratory syringe pump is a high-precision dosing device for microfluidic applications. The high-precision dosing and the almost pulseless flow streams make it the perfect tool for handling several liquids in the range from nanoliters to milliliters.

The integrated zero dead volume selection valve allows to handle multiple fluids with one syringe pump thanks to the high cleaning efficiency and low carryover. In combination with the user-friendly software, this system is an ideal solution for your laboratory experiments, especially in microfluidics.

Available with integrated rotary valve with up to 12 connections

SPECIFICATIONS

	LSPOne
Operating temperature	5-40°C
Operating humidity	20-80%, non-condensing
Max. pressure	7 bar
Wetted materials	PTFE or UHMW-PE, PCTFE and borosilicate glass
Carryover volume	Down to 1.5 µL (configuration dependent)
Plunger travel	30 mm with 96‘000 micro-steps for nearly pulseless flow
Plunger resolution	Selectable 3‘000 steps (standard) / 24‘000 steps (high)
Plunger drive	Screw drive with linear encoder for step loss detection
Valves configuration	Zero dead-volume multi-port distribution with angular encoder
Tube port fittings	Standard 1/4-28 UNF, flat-bottom
Cross-contamination	Typically from 1/100 to 1/1000 per cleaning cycle
Accuracy	< 1% deviation from expected value at full stroke
Electrical interface	USB mini, 9-pin D-Sub (other upon request)
Communication type	Serial (other upon request)
Power	18-24 VDC, 2.2 A peak, 40 W
Time for full stroke	2 - 3‘000 seconds
Dimensions	245 x 143 x 85 mm

BMT CONTROLLERS

Controllers
Start networking fluidic experiments

These controllers allow for operation as a stand-alone solution by connecting a monitor and input devices directly to the device connections (HDMI and USB). Program sequences can be loaded via USB sticks and started and stopped using the control buttons.

Several controllers can be connected to a fluidic network via LAN and also wirelessly via Wi-Fi. The simple programming of complex processes, over all connected controllers in the network, can be done centrally using the BMT software.

CON-DC

CON-SP

CON-PZ

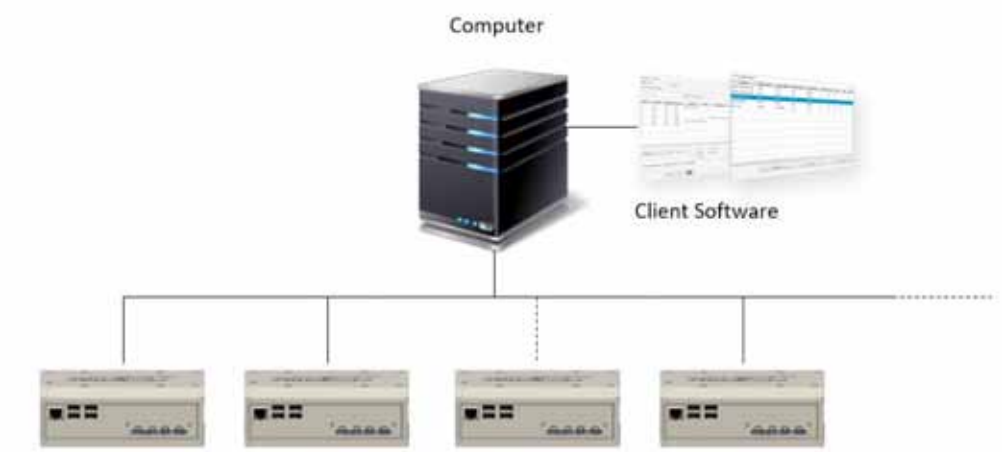
SPECIFICATIONS

	CON-DC	CON-SP	CON-PZ
Number of Ports	5	2	up to 4
Input voltage	24 VDC (1.5 A)		
Output signal	3 - 24 VDC (optional Xavitech Black Edition at 5th port)	0 - 440 mA stepper motor control	50 to 340 Vp-p with up to 60Hz
Communication interfaces	Wi-Fi, LAN (10/100) | Wi-Fi, LAN (10/100/1000)		
Additional connections	HDMI, 4 x USB, I2C prepared		
RAM	2 GB | 4 GB | 8 GB		
CPU	1200 MHz | 1500 MHz		
Dimensions	approx. 172.00 x 100.00 x 65.00 mm		
Features	Control of DC-pumps or DC-valves individually configurable per port connection **Valves:** • Using of holding voltage • Latching valve control **Pumps:** • Change in flow direction: CW, CCW • PWM control • Linear flow control programming with start and end parameters	Parameters for stepper motor pumps can be individually configured. • RPM, PPS and single step control • Step size: full step, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64 and 1/128 • Change in flow direction: CW, CCW • Linear flow control programming (RPM, PPS) with start and end parameters	Every port can be equipped with one Takasago piezo driver MPD-200A, which allows the control of up to four times two piezo pumps in parallel. • Output voltage: 50 – 340 Vp-p • Output frequency: 1 – 60Hz • Linear flow control programming with start and end parameters

BMT CONTROLLERS

Software
Start networking fluidic experiments

For the development of new devices or in research, new systems for controlling a wide variety of liquids are continuously being developed. Our fluidic systems are designed to meet the requirements of different combinations of fluidic components and shorten the development time of new ideas and solutions.



General program features

- Loading and saving of program sequences over all connected controllers
- Operate directly using the software on the controller
- Starting programs with a USB stick at the controller (stand-alone solution)

Fluidic network
Combine different BMT controllers in a fluidic network using LAN cable or Wi-Fi

Software controlled & programmable
Easily program fluidic operations and control all devices using the BMT PC software

Stand-alone solution
Start fluidic programs directly at the controller from a USB stick

The different BMT controllers can be connected to each other via a network and programmed centrally using the BMT software. In this way, a large number of pumps and valves can be easily combined and many different processes can be created.

The BMT software is constantly being updated with new features. You can find more information about the software solution in our online manual: https://wiki.pumps-valves.eu.

LABORATORY PERISTALTIC PUMPS

BT100-3J – 0-100 U/min – 0,1 U/min Auflösung
L100-1S – 0-100 U/min – 0,01 U/min Auflösung
GX00-2J (IP65) – 0-600 U/min - 0,1 U/min | 1 U/min Auflösung

BT100-3J

GX00-2J (IP65)

L100-1S

TECHNISCHE DATEN

	BT100-2J	L100-1S	G100-2J | G300-2J G600-2J (IP65)
Förderbereich (je nach Drehzahl und Schlauch)	1.5 µl/min - 500 ml/min	0.15 µl/min - 500 ml/min	1.5 µl/min - 3000 ml/min
Speed	0-100 U/min CW/CCW	0-100 U/min CW/CCW	0-100 U/min | 0-300 U/min 0-600 U/min CW/CCW
Drehzahlauflösung	0.1 U/min	0.01 U/min	0.1 U/min (G100-2J) 1 U/min (G300-2J | G600-2J)
Display	LCD		
Control mode	Touch screen control, external signal control and communication control		
External control	Start/stop control, direction control CW/CCW, speed control		
Communication control	RS485-Schnittstelle, Longer Protokoll oder Modbus-Protokoll		

BETA-TITANIUM NEEDLES FOR MEDICAL AND ANALYTICAL TECHNOLOGY

High precision, flexible and non-magnetic

Having absolutely no magnetism makes it particularly suitable for analyzers that use magnetic particles, like an immunoassay system.

The fine bore polishing (Ra 0.02 at minimum) reduces the carryover of samples (especially proteins), system flushing time and sample loss

Beta titanium needles flexibility

These sample needles, used for example in liquid handling, can not be bent since their original shape is restored. They are long-lasting due to its shape recovery characteristics with respect to bending (high tensile strength and superior spring characteristics), which contributes to longer life expectancy compared to stainless steel probes.

Their very smooth inner surfaces make these needles especially suitable for precisely dosing and aspirating of samples in the analysis field.

ß -Titanium tubes

The ß-Titanium tubes are characterized by high strength, but at the same time flexible and lightweight. They are laser-machined with uniquely designed slots, so that even tubes with a diameter of up to 6 mm remain flexible.

Spiral grooves can be selected as a further processing method of ß-Titanium tubes, as it is used for example in stents. This high-precision laser processing allows high flexibility, which can be limited to different directions or sections.

Comparison of the properties of ß-titanium to stainless steel

	flexibility	magnetism	corrosion resistance
ß-titanium	good	not magnetic	very well
stainless steel	bad	can be magnetic	good

FITTINGS

Capillary fittings

Custom fittings for glass and PEEK capillaries.

The fittings for capillaries made of glass or PEEK are made to customer specifications and offer an easy option for connection with microfluidic components such as pumps and valves.

The pressure range is between -900 and 7000 mbar, with a temperature range of 5 to 60°C as standard.

By simply screwing these fittings into a female connector, capillaries can be connected to other components. We would be happy to adapt the fittings to the sizes of your capillaries.

Push-in fittings for plastic tubes

These fittings allow easy connection and separation of plastic tubes made of PTFE / PFA (OD Ø2.0 mm | Ø3.0 mm). The fittings are available for connections with a M6 thread.

These connectors are currently made from PPS with FPM seals.

Fittings for PTFE tubes

The Flare Type (SM series) and Flange Type (FM series) fittings for PTFE tubes are available for threads M5, M6, M8, 1/4-28UNF, 5/16-24UNF manufactured from ETFE and PTFE.

L-pieces and connectors in R1/8, R1/4, R3/8 are also available on request.

PUSH-IN & PUSH-ON FITTINGS

PURE Series for pure oxygen and medical gases

Push-In & Push-On fittings

Standard connectors are available in almost all versions.

The PURE series is especially suitable for medical applications and applications with pure oxygen.

The individual parts of the connectors of the **PURE series** go through a multi-stage cleaning process to remove organic and inorganic contaminants. After cleaning, the components are assembled and then packed airtight to ensure cleanliness during transport and storage until the components are used on site.

All work is carried out in a structurally delimited clean room in accordance with VDA 19 Part 2.

Advantages of the PURE fittings for oxygen:

- Traceability through labeling / construction code
- Product purity requirements according to ASTM G93-03, DIN EN ISO 15001 and EIGA Doc 33/18.
- BAM-tested O-rings (FKM) and lubricants
- Airtight and labeled packaging
- Specific purity requirements possible

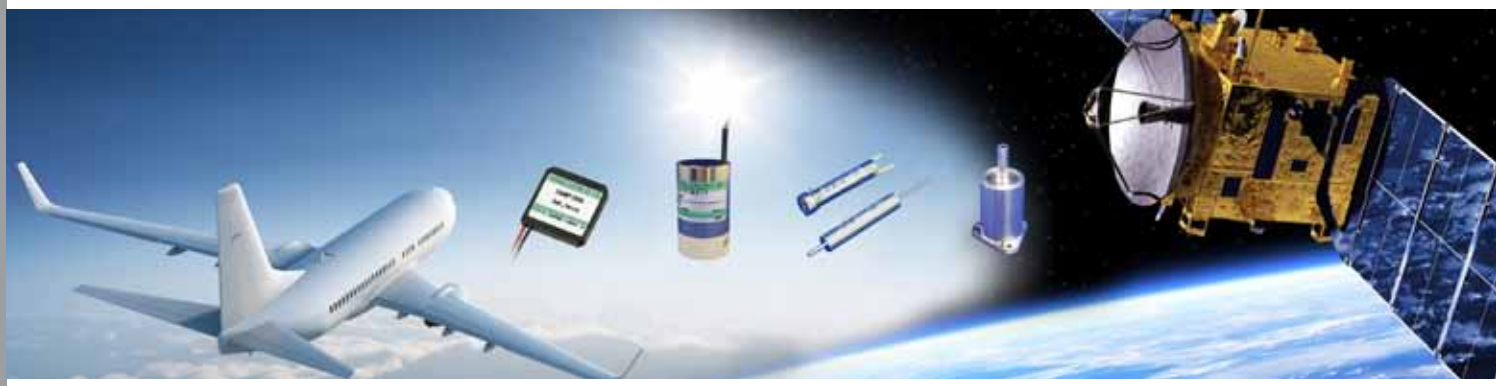
  All the advantages of the standard push-in fittings
  - secure connection
  - low internal volume
  - low dead volume
  - flexible and comfortable handling
  - high durability
  - 00% leak test

SPECIFICATIONS

	Push-In & Push-On fittings
Types	Push-In | Push-On (as standard and in PURE version)
Materials	stainless steel | PVDF | POM | PPSU | nickel-plated brass
Sealing material	FKM (BAM tested)
Temperature range	up to 140°C (depending on the choice of material)
Connection sizes	4 | 6 | 8 | 10 | 12 mm (outer diameter)
Thread sizes	M5 | G1/8 | G1/4 | G3/8 | G1/2 | R1/8 | R1/4 | R3/8 | R1/2
Operating pressure	-0.9 bar up to 20 bar (varies according to temperature) (depending on material and medium)
Purity requirements	specific degrees of purity from ⩽ 33 mg / m² to ⩽ 550 mg / m² possible

AEROSPACE ENGINEERING

With our partner Takasago we offer customised solutions like valves and pumps for the aerospace industry. With the strength of customisation, miniaturisation and integration, Takasago has developed more than 10000 models based on the requirements of our customers. With experience from the medical field and the know-how in production and manufacturing, we are also able to deliver smaller quantities to our customers.



Our experience in creating bespoke solutions and partnership with Takasago brings many benefits:

- Takasago: AS9100/EN9100 certified
- Advanced quality control and process control based on 40-years experience in the medical field
- Specialists in custom engineering and high-mix low-volume production
- Realisation of miniaturisation and weight saving

Examples of thruster valves for satellite propulsion systems:

HVA(L) Series

- 2/2-way normally closed, 2/2-way latching
- Orifice diameter: 0.4 mm
- Pressure range: 0 - 2 MPa (input)
- Dimensions: Ø6.2 x 31.4 - 58.0 mm (depending on the model)
- Weight: approx. 8 g
- ISO19683 vibration and shock requirements met (HVA-2-MFE).

HVC-Series

- 2/2-way normally closed
- Orifice diameter: 1.5 mm
- Pressure range: 0 - 2.8 MPa (input)
- Weight: approx. 200 g
- Frictionless moving core

CUSTOMISED SOLUTIONS

Customised products for optimal solutions

One of our greatest strengths, and those of our partners, is the customisation of products. In our catalogue you will therefore only find a selection of products, as the entire range offers several thousand variations.

We work with you to develop your specifications, so that we can offer a product that is customised to fully meet your needs.

With these adjustments and developments we offer you the opportunity to use an optimal product in terms of cost and performance.

In most cases, these specific adjustments and developments are completely free of charge.

EXEMPLARY PROCESS OF SUCH A PROJECT:

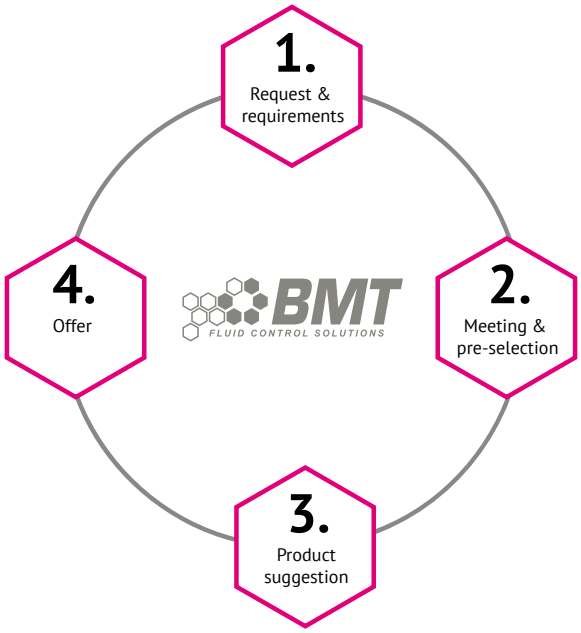
1. Request & requirements
You send us a request about a project and we work with you to record all relevant specifications.

2. Meeting & pre-selection
We discuss your project with respective partners, identify a product that is closest to meeting your requirements and discuss possible adjustments and add-ons.

3. Product suggestion
We offer you the most appropriate solutions with the respective adjustments and enhancements and discuss them with you.

Of course, you can also submit further requests for changes and suggestions.

4. Offer
After discussing the product proposal and integrating your change requests and suggestions, we will submit a detailed offer with the product data sheet for your customer-specific solution.



Changes and optimisations within certain conditions are also possible in the course of the project.
Here are a few examples:

- Increase in pressure
- Increase of the flow rate
- Increase of the pumping rate
- Lower power consumption
- Reduction of heat transfer
- Minimisation of the internal volume
- Reduction of the pumping volume
- Optimisation of the response time
- And much more

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ISO 9001 Quality Management Systems CERTIFIED

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