

Micro Annular Gear Pumps

For precise dosage of liquids



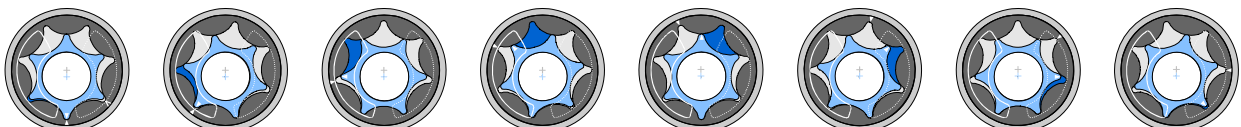
Due to careful material selection and advanced microtechnology design as well as high manufacturing precision micro annular gear pumps open a new dimension in pump technology. Four series of rotary positive displacement pumps allow precise and nearly pulsation-free dispensing of smallest quantities of liquids. The dosage volumes cover the sub-micro litre to litre range for both non-lubricating and highly viscous liquids. HNP Mikrosysteme offers also

comprehensive micro-dosing systems. The most significant characteristics of the pumps are their small dimensions, high operating lives as well as high dosage precision even for the smallest amounts of non-lubricating liquids. Thanks to DC drives and comfortable control the pumps offer high functionality and are easy to operate. The High Performance as well as the Hermetic and Chemically Inert mzr® Pump Series are employed in application fields such as chemical process technology,

assembly as well as dosage and filling techniques. The Low Pressure Pump Series corresponds to the requirements of instrumental analytics, fuel cells and OEM applications as far as dosage of low viscosity liquids is concerned. The Modular Series allows customized material selection for each component of the pump depending on chemical compatibility with the manipulated liquid.



- **High dosage precision**
precision CV < 1 % at low volumes
- **Min. dosage volume 0,25 µl**
- **Low flow rates**
1,5 µl/min ... 1152 ml/min
- **Compact dimensions**
- **High differential pressures**
achievable even for low viscosity liquids
- **Long service life**
wear-resistant tungsten carbide and ceramics
- **Broad viscosity range**
0,3 – 1.000.000 mPas
solvents, water, adhesives, paints, grease, gel
- **Pulseless delivery, low shear stress**
rotary micro annular gear technology



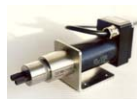
Range of products

Low pressure series



- compact dimensions
- low pressure range
- tungsten carbide Ni-based, stainless steel 316L
- seals: PTFE, FPM, optional: EPDM, FFFPM
- low viscosity liquids
- DC-motor with graphite brushes

High performance series



- industrial equipment
- tungsten carbide Ni-based, stainless steel 316L
- seals: PTFE, FPM, optional: EPDM, FFFPM
- differential pressure range 40 bar (max. 150 bar)
- low and high viscosity liquids
- DC-servomotor with integrated controller
- modular system: fluidic seal module, heat insulation module, electrical heating, double shell heating and cooling module, reduction gear, high-power motors

Ex-Pumps



- for pump heads of high performance series and the hermetic inert series
- Ex-certification ATEX, EU directive 94/9/EEC
- CE Ex II 2 G c T4 X, CE Ex II 2 G c T5 X
- tungsten carbide Ni-based, stainless steel 316L or ceramics, alloy C22
- seals: PTFE, FPM, optional: EPDM, FFFPM

Modular pump series



- chemically inert, compact dimensions
- configurable materials: ceramics, opt. tungsten carbide; alloy C276/C22, optional PEEK™;
- seals: PTFE, FPM, optional: EPDM, FFFPM.
- DC-motor with graphite brushes

Hermetic inert pump series



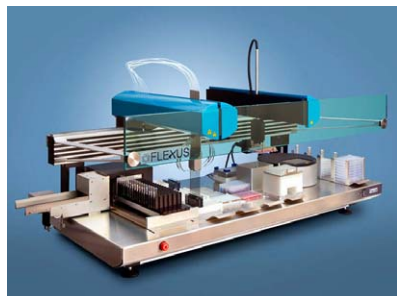
- chemically inert materials
- industrial equipment
- Al₂O₃, ZrO₂ ceramics, alloy C22, SSiC, Kalrez®
- hermetic magnetic coupling
- DC-servomotor with integrated controller

	V _g [μl]	flow rate [ml/min]							min. dosage volume [μl]	diff. pressure [bar]			viscosity [mPas]					
		0.001	0.01	0.1	1	10	100	1000		0	5	10	100	0	1	100	10 ⁴	10 ⁶
mzr-2521	1.5	0.0015*	0.15	9					0.25	1.5			0.3	100	1000*			
mzr-2921	3	0.003*	0.3	18					0.5	3			0.3	100	1000*			
mzr-4622	12		0.012*	1.2	72				2	5			0.3	100	1000*			
mzr-7223	48			0.048*	4.8	288			30	5	8*		0.3	100	1000*			
mzr-2905	3	0.003			18				0.5		30		0.3	50,000				
mzr-4605	12		0.012			72			2		50		0.3	50,000				
mzr-7205	48			0.048			288		30		40		0.3	1,000,000*				
mzr-7208	48			0.048			288		30		150		0.3	1,000,000				
mzr-11508	192				0.192			1152	100		150		0.3	150,000				
mzr-11507	192					29	1152		100		150		0.3	150,000				
mzr-2909 Ex	3	0.003			14				0.5		5		0.3	5000				
mzr-4609 Ex	12		0.012			56			2		10		0.3	5000				
mzr-7209 Ex	48			0.048			225		30		40		0.3	5000				
mzr-11507 Ex	192					29*	58	1152	100		80		0.3	5000				
mzr-6359 Ex	24		0.024				112		15		15		0.3	100				
mzr-7259 Ex	48		0.048				225		30		20		0.3	100				
mzr-2542	1.5	0.0015*	0.15	9					0.25	1.5			0.3	100	1000*			
mzr-2942	3	0.003*	0.3	18					0.5	3			0.3	100	1000*			
mzr-7245	48		0.048				288		30	5	40*		0.3	10,000				
mzr-6355	24		0.024				144		15		15		0.3	1000				
mzr-7255	48		0.048				288		30		20		0.3	1000				

V_g = Displacement volume

* with accessories, e.g. high resolution encoder, gear box, etc.

Applications fields



- Robotic sample processor
- Analytical instrumentation
- Sampling
- Micro reaction technology / Flow Chemistry
- Fuel cells
- Minimum quantity lubricating systems
- Aromatizing, flavoring
- Particle analysis
- Buoy water analysis
- PCB cooling
- Ink-jet printing technology
- Biological cell handling
- DNA analysis
- Medicine filling



- Automated application of silicone sealant beads
- Color marking application
- Spray-coating of blood test tubes
- Mini plant technology
- Polymer development
- PU filling
- Application of separating agents in the plastic deformation process
- Technically challenging dosage from or into vacuum
- Dispensing of polishing slurry in the wafer manufacturing process
- Tin plate lubrication
- Micro hydraulics



- Ink cartridge filling
- Organic electronics
- Silicone application on medical disposables
- Nozzle testing in heating engineering
- Dosing of additives into extruder
- On-line color mixing system for paints
- Dispensing of printing inks
- Dosage of UV-curing adhesives
- Lubricant dosage in the watch/clock assembly
- Micro hydraulic aggregate for helicopters
- Filling of radioactive isotope solutions
- Dosage of liquid metals (mercury, sodium)
- Polyurethane filling

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