

## Product summary

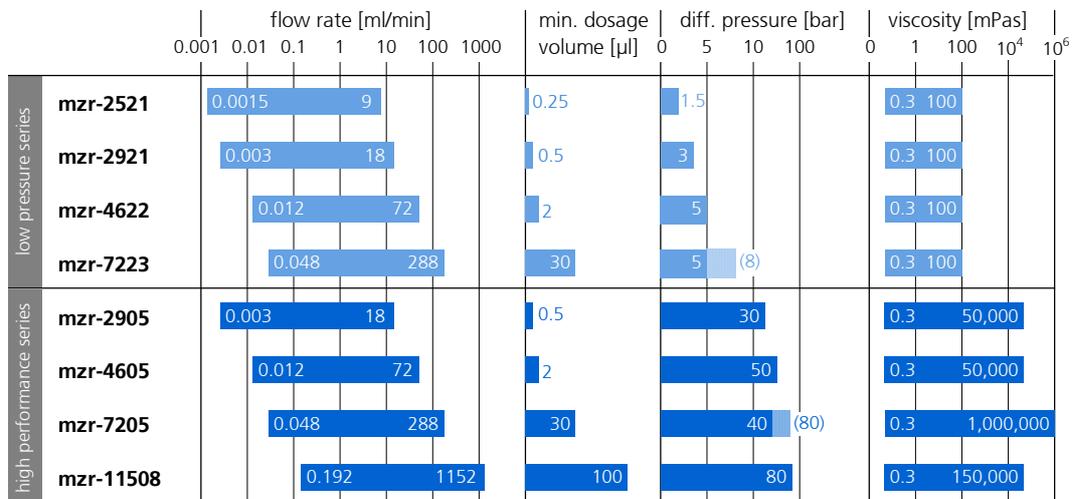
### Micro annular gear pumps

High performance series, low pressure series



#### Micro annular gear pumps

Technology	<ul style="list-style-type: none"> <li>Precise dosage</li> <li>Compact dimensions</li> <li>Pulseless delivery</li> <li>Lowest flow rates</li> <li>Low shear stress</li> </ul>	<ul style="list-style-type: none"> <li>Suitable for non-lubricating liquids</li> <li>DC-drives</li> <li>Long service life due to tungsten carbide and ceramic components</li> <li>Large choice of accessories</li> </ul>
Series	<h4>Low pressure series</h4>  <p>m zr-7223   m zr-4622   m zr-2921   m zr-2521</p>	<h4>High performance series</h4>  <p>m zr-11508   m zr-7205   m zr-4605   m zr-2905</p>
Applications	<ul style="list-style-type: none"> <li>Analytical instrumentation</li> <li>Biotechnology</li> <li>Fuel cells</li> </ul>	<ul style="list-style-type: none"> <li>Chemical processing</li> <li>Industrial and plant engineering</li> <li>Packaging and dosage</li> </ul>
Specification	<ul style="list-style-type: none"> <li>compact dimensions</li> <li>low pressure range</li> <li>low viscosity liquids</li> <li>DC-motor with graphite brushes</li> </ul>	<ul style="list-style-type: none"> <li>industrial equipment</li> <li>medium pressure range</li> <li>low/high viscosity liquids</li> <li>integrated, programmable controller</li> </ul>



The material property of a liquid (e.g. viscosity, lubricating property, particle content, corrosiveness) impacts the technical data and the service life of pumps.  
At appropriate conditions the characteristic values may be increased or decreased.

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## Product characteristics micro annular gear pumps

Pump series Pump size	High performance				Low pressure				
	2905	4605	7205	11508	2521	2921	4622	7223	
<b>1. Construction</b>									
Displacement volume [μl]	3	12	48	192	1.5	3	12	48	
Measurements [mm] [inch]	L x W x H or Ø x L L x W x H or Ø x L, ca.	140 x 45 x 65 5.5 x 1.8 x 2.6	143 x 45 x 65 5.6 x 1.8 x 2.6	155 x 50 x 69 6.1 x 2.0 x 2.7	309 x 108 x 124 12.2 x 4.3 x 4.9	Ø 13 x 75 0.51 x 2.95	Ø 13 x 75 0.51 x 2.95	Ø 16 x 87 0.63 x 3.50	Ø 25 x 147 0.98 x 5.12
Weight [g] [lbs]		780 0.354	800 0.363	1080 0.490	ca. 8000 ca. 3.63	56 0.025	56 0.025	100 0.045	370 0.168
Internal volume [μl]		85	109	525	8506	65	67	85	238
Gear material	Tungsten carbide (WC-Ni)	●	●	●	●	●	●	●	●
Case material	Stainless Steel	316L (1.4404/35)	316L (1.4404/35)	316L (1.4404/35)	316L (1.4435)	⊙	⊙	⊙	⊙
	Nickel silver	–	–	–	–	●	●	●	●
	Epoxy resin	–	–	–	–	●	●	●	●
Bearing material	Tungsten carbide (WC-Ni)	●	●	●	●	⊙	⊙	⊙	⊙
	Ceramics Al <sub>2</sub> O <sub>3</sub>	–	–	–	–	●	●	●	●
Dynamic seal material	PTFE graphite reinforced	●	●	●	●	●	●	●	
Static seal material	FPM (Viton®)	●	●	●	●	●	●	●	●
	EPDM	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
	FFPM	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Fluid connection	Slip fittings	–	–	–	–	2 mm	2 mm	2 mm	5 mm
	Manifold assembly	–	–	–	–	⊙	⊙	⊙	⊙
	1/4" -28 UNF	●	●	–	–	–	–	–	●
	1/8" NPT	–	–	●	–	–	–	–	–
Tubing-ID		1/16"	1/16"	4 mm	10 mm	1/16"	1/16"	1/16"	1/16", 4 mm
	Tubing-OD	1/8"	1/8"	6 mm	12 mm	1/8"	1/8"	1/8"	1/8", 6 mm
	Shaft coupling	Bellow type	●	●	●	●	–	–	–
	Rubber type	–	–	–	–	●	●	●	
<b>2. Characteristics</b>									
Flow rate Q [ml/min]	min.	0.003	0.012	0.048	0.19	0.0015 *	0.003 *	0.012 *	0.048
	max.	18	72	288	1152	9	18	72	288
	[l/h]	max.	1.08	4.3	17.28	69.12	0.54	1.08	4.32
Min. dosage volume [μl]		0.5	2	30	100	0.25	0.5	2	30
Differential pressure [bar]	(for viscosity 1 mPas)	5	10	40 (80 *)	80	1.5	3	5	5 (8 *)
	[psi]	73	145	580 (1160 *)	80	22	44	73	73 (116 *)
Differential pressure [bar]	(for viscosity 16 mPas)	30	50	40 (80 *)	5	1.5	3	5	5 (8 *)
	[psi]	435	725	580 (1160 *)	10 - 40 *	22	44	73	73 (116 *)
Max. inlet pressure [bar]		5	5	5	5	1	1	1	1
	[psi]	73	73	73	73	15	15	15	15
Viscosity □ [mPas]	min.	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	max.	50,000	50,000	50,000	150,000	100	100	100	100
	with accessories			1,000,000		1,000	1,000	1,000	1,000
Precision CV [%]		< 1	< 1	< 1	< 1	1	1	1	1
Pulsation [%]		6	6	6	6	1.5	6	6	6
NPSH <sub>R</sub> [m]		0.9	5.7	0.5		0.6	0.6	0.5	0.4
	with accessories	0.4	0.5	0.5		–	–	–	–
Operating temperature [°C]	min.	-5	-5	-5	-5	-20	-20	-20	-20
	max.	60	60	60	60	60	60	60	60
	with accessories	150	150	150	120	–	–	–	–
<b>3. Accessories</b>									
Console drive module	mzr-S05 (E)	mzr-S05 (E)	mzr-S05 E	–	mzr-S06	mzr-S06	mzr-S06	mzr-S06 E	
Fluidic seal module	●	●	●	●	–	–	–	–	
Heat isolation module	●	●	●	●	–	–	–	–	
Heating module	●	●	●	●	–	–	–	–	
Double shell heating module	●	●	●	●	–	–	–	–	
Gear box	–	●	●	●	●	●	–	–	
Dosage module	●	●	–	–	●	●	–	–	
Bypass module (1/2/6 port)	⊙	⊙	–	–	●	●	●	–	
<b>4. Drive</b>									
DC-Motor with graphite brushes	–	–	–	–	18V / 3W	18V / 3W	24V / 4.5W	24V / 20W	
DC-Motor brushless	mzr-xx06	–	–	24-48V/ 200W	–	⊙	⊙	⊙	
DC-Servomotor	mzr-xx05	24V / 44W	24V / 44W	24V / 44W	–	–	–	–	
	mzr-xx08	–	–	24V / 201W	42V / 368W	–	–	–	
AC-Motor, three-phase	mzr-xx07	–	–	400V / 140W	400V / 400W	–	–	–	
DC-Explosion-proof motor	mzr-xx09	24V / 50W	24V / 50W	24V / 50W	–	–	–	–	
<b>5. Control</b>									
Discrete dosage and continuous delivery	mzr-xx05	integrated	integrated	integrated	–	S-ND	S-ND	S-ND	S-HD
	mzr-xx08	–	–	S-HP	S-HP	–	–	–	–
	mzr-xx09	S-HD	S-HD	S-HD	S-HD	–	–	–	–
Continuous delivery	mzr-xx06	–	–	S-HV	–	S-KG-21	S-KG-21	S-KG-22	–
	mzr-xx07	–	–	S-FI	S-FI	S-KD-21	S-KD-21	S-KD-22	S-KD-23
	mzr-xx08	–	–	S-HV	S-HV	–	–	–	–

Values are valid for standard version. Customized solutions on request.

Depending on liquid viscosity and pump configuration values for pressure and precision may differ from those mentioned above.

### Legend:

- applicable / available
- ⊙ option / customized solution
- not applicable / not available
- \* with accessories

CV Coefficient of Variation

NPSH<sub>R</sub> Net Positive Suction Head Required

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