

## Modular pump series

### Micro annular gear pumps m zr<sup>®</sup>-11540

Pump for precise filling and dosing technology



- **High precision**  
in metering and delivery
- **Dynamic drive technology**  
in regards to requirements with BLCD drive, BLCD drive with electronic module, stepper motor
- **Broad viscosity range**  
solvents, adhesives, water, grease, gel, colors
- **Long service life**  
wear-resistant tungsten carbide
- **Low pulsation delivery, low shear stress**  
rotary micro annular gear technology, no valves

Micro annular gear pump m zr-11540 of the modular pump series operates with high dynamics, low pulsation and excellent precision in delivery as well as high repeatability in metering.

The pump is suitable for low to high viscosity liquids and a differential pressure of up to 15 bar. It allows accurate displacement volumes starting at 100 µl in a metering time of 200 milliseconds.

It also covers a flow rate range of 0.2 to 1152 ml/min. The pump comes with lateral fluid connections or with a manifold version with frontal fluid connections.

#### Application fields

- Mechanical engineering
- Chemical and pharmaceutical industry
- Process engineering
- Adhesives and sealants applications
- Spray-coating technology
- Coating technology
- Metering of different additives
- Filling technology
- Dosing of inks and colors

#### Technical data

Pump type	m zr-11543	m zr-11545X1	m zr-11547	m zr-11548X1
Drive version	stepper motor	BLDC-motor with electronic module	AC-motor	DC-servomotor, brushless
Flow rate	0.192 – 96 ml/min	9.6 – 768 ml/min	28.8 – 1152 ml/min	1.92 – 960 ml/min
Smallest dosage volume	100 µl			
Displacement volume	192 µl			
Differential pressure range	0 – 15 bar (217,5 psi) (depending on liquid and viscosity)			
Max. system pressure	15 bar (217,5 psi) (inlet pressure + differential pressure)			
Ambient temperature range	0 ... +40 °C	0 ... +40 °C	0 ... +40 °C	0 ... +60 °C
Liquid temperature range	-5 ... +60 °C			
Viscosity range	0.3 – 10.000 mPas			
Dosage precision	1 % Coefficient of Variation CV			
Fluid connection	3/8" NPT, lateral	3/8" NPT, lateral optional: manifold assembly M4	3/8" NPT, lateral	3/8" NPT, lateral optional: manifold assembly M4
Wetted parts	stainless steel 316 L, tungsten carbide Ni-based; shaft sealing: graphite-reinforced PTFE, Alloy C276; static sealing: FKM, optional: EPDM, FFKM			

#### Contact

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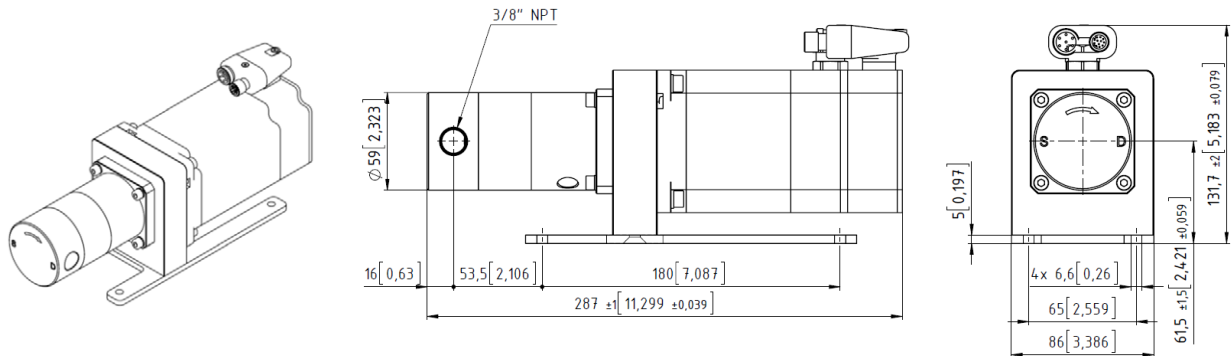
Pump type	mzr-11543	mzr-11545X1	mzr-11547	mzr-11548X1
Drive	stepper motor NEMA 34-Standard bipolar, 9.5 A, step angle 1.8° (full step), IP 65	BLDC-motor with electronic module 48 VDC, 7.2 A, 251 W, IP 54	AC-motor, size 56, 4-pole rated voltage 240/400 V, rated frequency 100 Hz, 240 W, IP 55	DC-servomotor, brushless rated voltage 36 V DC, power output 201 W, torque 192 mNm, IP 54
Speed range	1 – 500 rpm	50 – 4000 rpm	150 – 6000 rpm	10 – 5000 rpm
Positioning	number of steps	positioning mode	no	1000 pulses/rev., analog hall sensors
motor protection	protection against overload	protection against overload	thermal contact (NC)	motor current monitoring
Interface	plug M16, M12	logic cable / power cable	terminal box with 2 couplings M16	6-pole plug for motor winding, 5-pole plug for hall sensors
Cable length	1.8 m	3 m	without cable	2 m
Dimensions (L x W x H)	287 x 86 x 132 mm	261 x 63 x 93.3 mm	340 x 104 x 137 mm	254 x 84 x 93 mm
Weight	approx. 8.2 kg	approx. 3.7 kg	approx. 9.1 kg	approx. 3.9 kg

## Controller

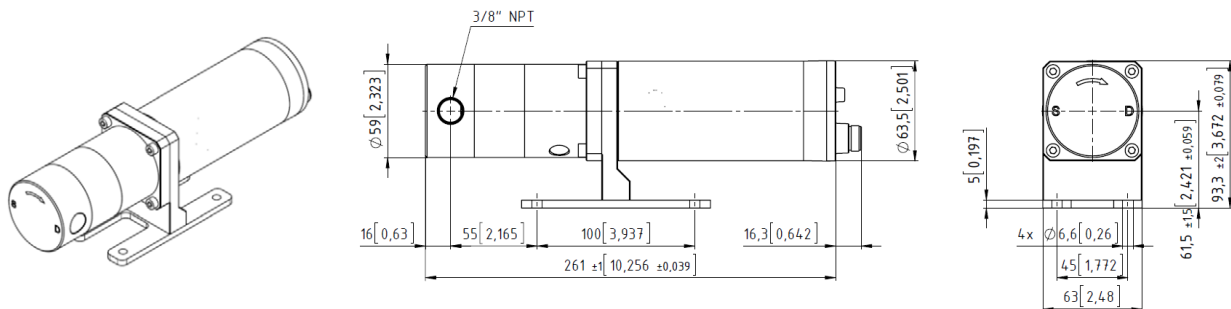
	external	integrated	external	external
Type	N5-1-2	electronic-module K4	S-DE-E1, S-DE-E3	S-BL
Interface	Ethernet, CANopen	RS-485 (selection of operating modes and parameter setting)	0-10 V / (0)4-20 mA, 4 digital inputs, configurable, optional CANopen, Modbus	RS-232, 0-10 V, 1 digital input, 1 configurable output
Programming	yes	no, only parameterization	optional parameterization module	yes

Even if single parameters are within the indicated performance range of technical data, certain parameter combinations may not be achievable. Single parameters may exceed their indicated performance range under adequate circumstances. For detailed evaluation please contact HNP Mikrosysteme. Actual performance may vary. Specifications are subject to change without notice.

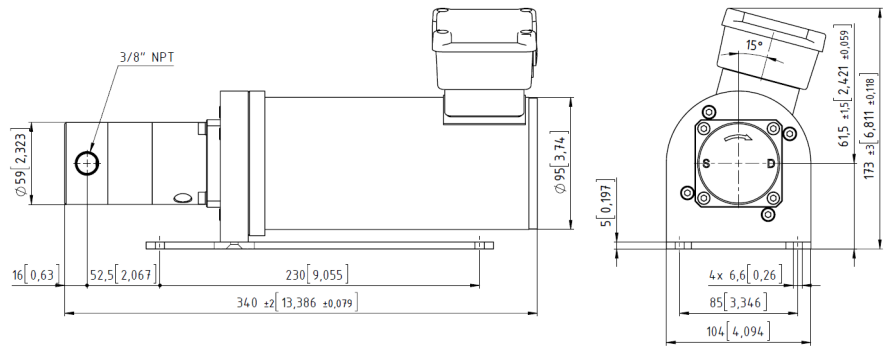
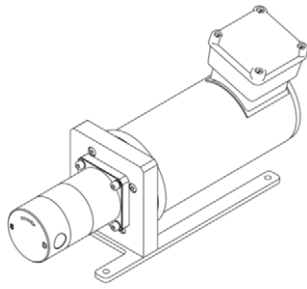
## Dimensions



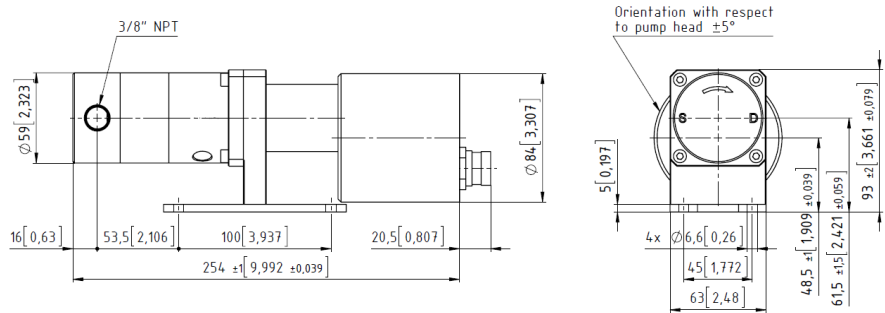
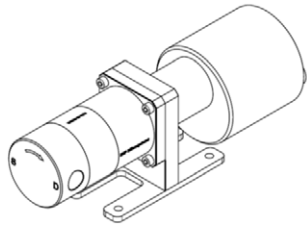
mzr-11543 with stepper motor



mzr-11545X1 with BLDC-motor and electronic-module



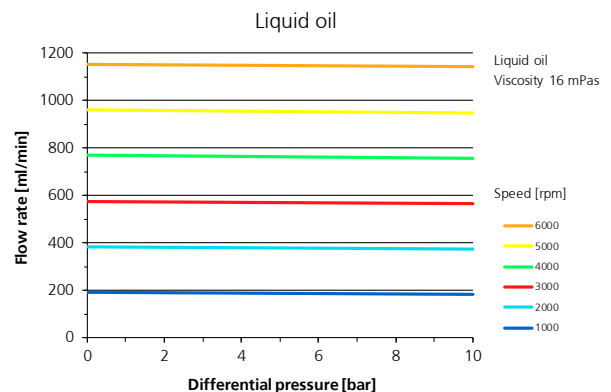
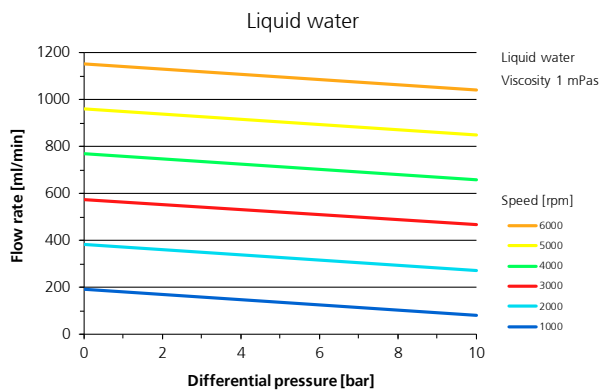
mzr-11547 with AC-motor



mzr-11548X1 with DC-Servomotor, brushless

Subject to technical changes.

## Flow charts



## Item number

12 05 00 01	pump mzr-11543-hs-vb with stepper motor; materials: tungsten carbide Ni-based, stainless steel 316L; lateral fluid connection 3/8" NPT
12 05 00 02	pump mzr-11545X1-hs-vb with BLDC-motor and electronic-module; materials: tungsten carbide Ni-based, stainless steel 316L; lateral fluid connection 3/8" NPT
12 05 00 03	pump mzr-11547-hs-vb mzr-11547 with AC-motor; materials: tungsten carbide Ni-based, stainless steel 316L; lateral fluid connection 3/8" NPT
12 05 00 04	pump mzr-11548X1-hs-vb with DC-Servomotor; materials: tungsten carbide Ni-based, stainless steel 316L; lateral fluid connection 3/8" NPT

## Optional equipment

<i>Fluidic seal module</i>	use of liquids sensitive to air or water or for vacuum applications
<i>Heat insulation module</i>	use for increased liquid temperature
<i>Liquid supply accessories</i>	tubes, filters etc.

Micro annular gear pumps (and housings) are protected by assigned patents: EP 1115979 B1, US 6,520,757 B1, EP 852674 B1, US 6,179,596 B1, EP 1354135, US 7,698,818 B2. Patents pending DE 10 2011 001 041.6, PCT/IB2011/055108, EP 11 81 3388.3, US 13/884,088, CN 2011 8006 5051.7, HK 13 11 2934.9, DE 10 2011 051 486.4, PCT/EP2012/061514, EP 12 728264.8, US 9,404,492 B2, CN 2012 8003 8326.2. In the US, Europe and China additional patents are pending. mzr®, MoDoS®, µ-Clamp®, HNPM® are registered German trademarks of HNP Mikrosysteme GmbH.