

High performance series 

Micro annular gear pumps m zr[®]-2509 Ex / 2909 Ex / 4609 Ex / 7209 Ex

Ex-pumps for application in chemical and process technology







- **Ex-certification ATEX**
conform with EU Directive 2014/34/EU
- **High dosage precision**
precision CV < 1 % at low volumes
- **Compact dimensions**
length < 295 mm, including Ex-motor
- **Broad viscosity range**
methanol, solvents, adhesives, grease, gel
- **Long service life**
wear-resistant tungsten carbide
- **Low pulsation delivery, low shear stress**
rotary micro annular gear technology

The micro annular gear pumps m zr-2509 Ex, m zr-2909 Ex, m zr-4609 Ex and m zr-7209 Ex cover the flow range 0.003-226 ml/min. The highly precise, low pulsation small volume dosage even of non-lubricating

liquids or at high pressure, the compact design of the Ex-pumps, the broad viscosity range and the small dimensions are unique features of this pump series. The pumps are applied in the field of chemical and process technology

and are suitable for both continuous delivery and discrete dosage of watery solutions, solvents, oil and other viscous liquids. Accessories extending the operating parameters of the device are available.

Technical data

| | m zr-2509 Ex | m zr-2909 Ex | m zr-4609 Ex | m zr-7209 Ex |
|---|---|--|---|--|
| Flow rate | 0.0015 – 7 ml/min | 0.003 – 14 ml/min | 0.012 – 56 ml/min | 0.048 – 226 ml/min |
| Smallest dosage volume | 0.25 µl | 0.5 µl | 2 µl | 30 µl |
| Displacement volume | 1.5 µl | 3 µl | 12 µl | 48 µl |
| Differential pressure range | 0 – 5 bar | 0 – 5 bar | 0 – 10 bar | 0 – 40 bar |
| Max. inlet pressure | 5 bar (10 bar *) | 5 bar (10 bar *) | 5 bar (10 bar *) | 5 bar (10 bar *) |
| Ambient temperature range | 0 ... +40 °C | 0 ... +40 °C | 0 ... +40 °C | 0 ... +40 °C |
| Liquid temperature range | -5 ... +40 °C | -5 ... +40 °C | -5 ... +40 °C | -5 ... +40 °C |
| Viscosity range | 0.3 – 5000 mPas | 0.3 – 5000 mPas | 0.3 – 5000 mPas | 0.3 – 5000 mPas |
| Precision (Coefficient of Variation CV) | < 1 % | < 1 % | < 1 % | < 1 % |
| Ex-certification |  II 2G c IIC T5 X |  II 2G c IIC T5 X |  II 2G c IIC T5 X |  II 2G c IIC T4 X |
| Place of installation | Ex-area zone 1, 2 | | | |
| Wetted parts | stainless steel 316L (1.4404, 1.4435), Ni-based tungsten carbide shaft seal: graphite-reinforced PTFE, 316L static seals: FPM, optional: EPDM, FFPM | | | |
| Drive | DC-motor, 24 V DC, 2 A, 53 W, encoder: 500 counts per turn, type HEDL 5540 | | | |
| Speed range | 1 – 4700 rpm | | | |
| Cable length | 10 m | | | |
| Weight | ca. 2500 g | | | |

Customized solutions on request.

* with optional fluidic seal module

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.

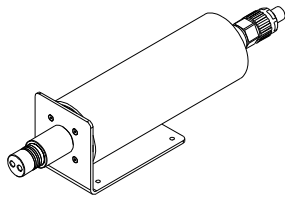
Contact

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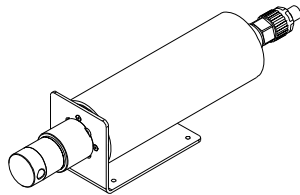
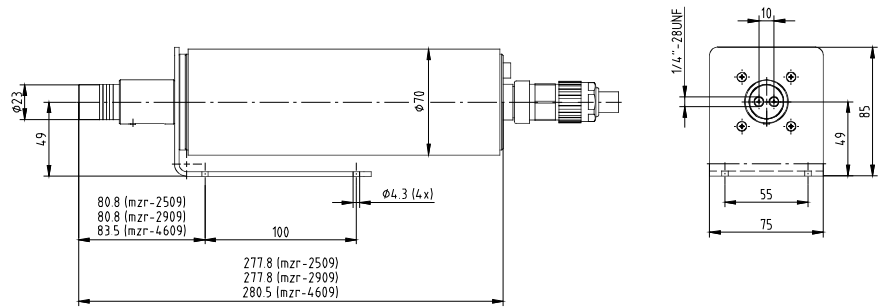
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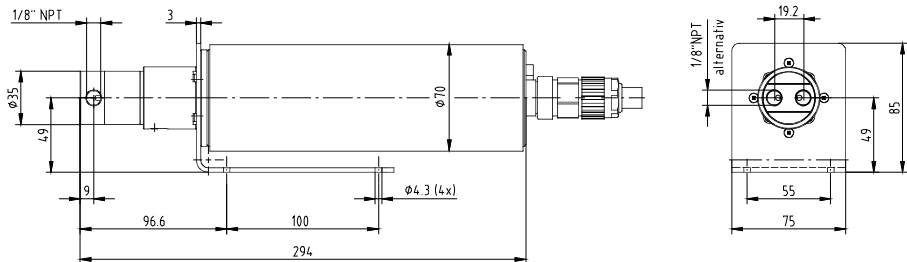
Dimensions



mZR-2509 Ex / 2909 Ex / 4609 Ex



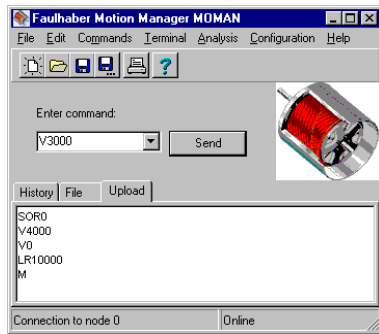
mZR-7209 Ex



All dimensions in mm
Subject to technical changes.

For flow charts refer to individual product sheets mZR-2505, mZR-2905, mZR-4605, mZR-7205

Control and software (Accessories)



- speed and position control for continuous and discrete dispensing tasks
- terminal box with potentiometer for speed control
- RS-232 9-pole SUB-D connector to connect directly to a PC or a SPC
- analog input with terminal screw
- power supply with DIN 45323 socket, pin plug or terminal screw
- EEPROM program memory
- simple ASCII command language for parameter setting (velocity profiles) and programming of the motor
- programming with Windows® software »Motion Manager«
- temperature and current limiting
- online dynamic drive analysis
- simultaneous operation of up to 255 pumps with additional multiplexer modules

Item number

10 03 01 52
10 03 01 23
10 03 01 24
10 03 01 31

pump mZR-2509 Ex, fluid connection $1/4''-28\text{UNF}$, frontal
pump mZR-2909 Ex, fluid connection $1/4''-28\text{UNF}$, frontal
pump mZR-4609 Ex, fluid connection $1/4''-28\text{UNF}$, frontal
pump mZR-7209 S Ex, fluid connection $1/8''\text{NPT}$, lateral

Accessories

Liquid supply accessories

threaded fluid connectors, tubes, filters etc.

Fluidic seal module

use of liquids sensitive to air or water or for vacuum applications

Control

S-HD-KL: programmable microcontroller-based control for continuous delivery and discrete dosage, installed outside of the Ex-area

Console drive module

diecast aluminum chassis mZR-S05 ES with control elements and display, installed outside of the Ex-area

Multiplexer module

simultaneous operation of up to 255 pumps with a single RS-232 interface

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®, HNPMP® are registered German trademarks of HNP Mikrosysteme GmbH.