

## Product information

### Compact and smart dosing system · $\mu$ Dispense



#### Description

The Micro Dispense Module  $\mu$ Dispense<sup>®</sup> is a compact system for the precise dosing and metering of liquids in the microliter to milliliter range.  $\mu$ Dispense<sup>®</sup> guarantees a process-safe liquid handling, with high precision and trueness. It reduces maintenance expenses due to its long service life. The size of a Micro Dispense Module corresponds to the half-height syringe pumps format. With the Cavo<sup>®</sup> script language protocol and an extended command set, syringe pump programs can be processed. Due to the interface compatibility, syringe pumps can easily be replaced.

The Micro Dispense Module is characterized by its modular design with optional modules, such as shiftable in- and outlet, optional pump size, filter and flow sensor. The core component is a micro annular gear pump, a robust and highly precise device with an extremely long service life and low pulsation. The quiet and rotatory operating micro annular gear pump allows dispensing smallest volumes of liquid on the one hand, and a continuous, uninterrupted and reversible flow on the other hand. Rinsing with high flow rates is also possible with the same system. A powerful electronics with integrated drive controller monitors and controls the system. Together with the flow sensor a closed loop controlled flow is possible.

#### Applications

- Analytical instrumentation
- Biotechnology
- Laboratory automation
- Blood typing
- Ion channel screening
- Flow Cytometry
- Cell sorting
- DNA isolation
- Chromatography
- IVD

## Technical data

Pumps	mzr-2521, mzr-2921, mzr-4622
Flow rate range (without control)	up to 72 ml/min *
Controlled flow rate range	1 - 1,000 µl/min *
Dosing volume	beginning from 1 µl
Precision CV	< 1% (Coefficient of variation CV)
Differential pressure range	0 - 1.5 bar (22 psi)
Storage temperature range	-20 ... +65 °C (+104 ... +149 °F)
Liquid temperature range	-5 ... +60 °C (+23 ... +140 °F) @ 20 ... 95 % humidity
Viscosity range	up to 5mPas
Liquids	aqueous solutions, solvents
Materials of pump	stainless steel 316L, ceramics, tungsten carbide Ni based, epoxy resin; shaft seal: graphite-reinforced PTFE, stainless steel 316L; static seals: FPM, optional: EPDM, FFPM
Additional materials	manifold: PMMA, optional: PEEK™; valve: PEEK™, FFPM optional: PPS, FPM, EPDM; volume flow sensor: borosilicate glass
Seal materials	static seal: FPM, optional: EPDM, FFPM
Electronics	ARM Cortex M3 microprocessor
Motor	brushless DC-motor (BLDC); nominal voltage 24 V, torque 3.3 mNm; analog hall sensors
Electrical connection	D-sub plug, 15-pole (male connector)
Power supply	24 V DC ±10 %, max. 1.5 A
Interface	RS-232 and RS-485 with 9600 or 38400 Baud; CAN with 100 and 125 kBaud
Protocol	standard commands of syringe pumps OEM Communication (OC) protocol and Data Terminal (DT) protocol
Addressing	max. 15 devices with RS-485 Bus ("daisy-chaining"); max. 15 devices with CAN-Bus
Inputs and outputs	2 additional digital inputs with TTL Level; 3 additional outputs with TTL level
Fluid connection	1/4"-28 UNF
Accessories	additional fluidic inlets and outlets, filter, gear box, volume flow sensor
Dimensions (L x W x H)	106.7 x 44.4 x 127.0 mm (4.2" x 1.75" x 5.0")
Weight	approx. 800 g
Remarks	* depending on the size of the micro ring gear pump.

### Notice

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.

## Accessories

- mzr-2521
- mzr-2921
- mzr-4622

### Dispense Module in syringe pump format

- size of half-height syringe pumps format
- communication via syringe pump programming commands and expanded command set
- compatible integration in analytical devices
- modular design (fluid in- and outlet, sensors, filter, materials)
- low noise level

### Micro annular gear pump

- high precision of dispense volume and volume flow
- discrete dosing of smallest liquid volumes
- continuous, uninterrupted volume flow with low pulsation
- wide dynamic range of pump with low dosing volumes and high volume flow for rinsing without replacement of components
- long service life and low life cycle costs
- low cycle times

### Sensor control and monitoring (optional)

- precise controlled volume flow
- process monitoring and documentation

### Patents and trademarks

Micro annular gear pumps (and housings) are protected by assigned patents: EP 1 354 135 B1; US 7,698,818 B2; DE 10 2011 001 041 B4; CN 103 348 141 B; US 10,012,220 B2; CN 103 732 921 B; US 9,404,492 B2; US 6,520,757 B1.

HNPM<sup>®</sup>, mZr<sup>®</sup>, MoDoS<sup>®</sup>,  $\mu$ -Clamp<sup>®</sup>,  $\mu$ Dispense<sup>®</sup>, Centifluidic Technologies<sup>®</sup> are registered German trademarks of HNP Mikrosysteme GmbH.

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Last update 2019/07