Product information

By-pass module · Supplementary Modules

Description

With the by-pass module constant small flow rates reaching the nanoliter range can be obtained. The technology bases on the partitioning of flow according to the relationship of the fluidic resistance of two capillaries. The flow is generated by a micro annular gear pump and shows a very good constancy and little pressure dependence. This technology creates an almost pulsation-free master circulation, from which a side current is derived. Smallest flow rates starting at 1 µl/h can be achieved. Depending on the differential pressure and flow rate range an adjusting range of 1:100 may be obtained. The lower limit of flow rate is defined by tuning of the two capillary tubes and can be adjusted according to customer's needs from 1 to 10,000 µl/h.

Working principle

The by-pass module shown in the picture consists of a main circulation with a micro annular gear pump and a master capillary tube. A secondary capillary diverts the dosing flow from the main circulation according to the differential pressure ratio in both capillary tubes. The customized dimensioning of the system is carried out by analogy with the bleeder chain rules in electrical engineering. The main and the secondary capillary correspond to hydraulic resistors, which split the flows reciprocally proportional. Pump size and capillaries are adapted to each other in such a way that the pump is in the right working range and the desired outlet pressure is achieved. The by-pass module serves as a fixture for integration of a micro annular gear pump. The by-pass module is tested and adjusted.

Advantages

- Flow rate in Nanoliter range flow rate from 1 µl/h to 10 ml/h
- Wide flow rate range small-volume dispensing with a adjusting range maximum 1:100
- Low-pulsation delivery damped flow
- Pressure resistance generation of pressure up to 3 bar
- Customized system for use with micro annular gear pumps mzr-2521 M2.1, mzr-2921 M2.1, mzr-2542 M2.1, mzr-2942 M2.1 or mzr-4622 M2.1

Appliations

- Analytical instrumentation
- Flow chemistry
- Lubrication
- Biotechnology

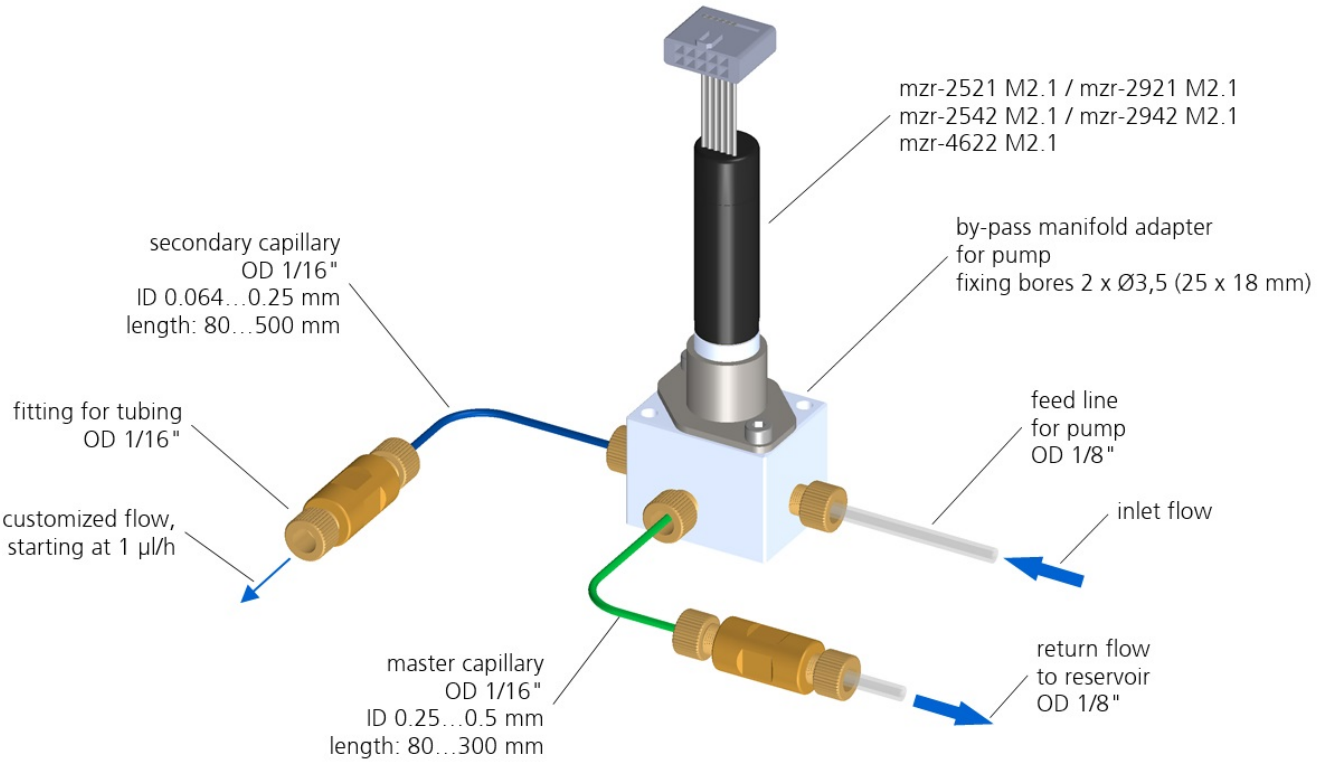
Technical data

Flow rate	1 - 10,000 µl/h
Adjustment range	1 : 100
Differential pressure range	0 – 3 bar
Maximum inlet pressure	1 bar
Pulsation	< 1%
Liquid temperature range	-20 ... +60 °C
Viscosity range	0.3 - 100 mPas
Fluid connection	capillary fittings 1/4"-28 UNF; feed line: tubing, OD 1/8“; master capillary: tubing, OD 1/8“; secondary capillary: tubing, OD 1/16“
Wetted parts	by-pass manifold adapter stainless steel 316L, optional: PEEK™; fittings and tubings: ETFE, PEEK™
Dimensions (L x W x H)	32 x 25 x 25 mm (By-pass block without pump)
Weight	approx. 160 g (version 316L without pump) approx. 50 g (version PEEK™ without pump)
Remarks	subject to technical changes

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. This document is subject to change without notice.

Setup of By-pass module and pump



Patents and trademarks

Our products are protected by the following national and international patents: DE 10 2018 129 631.2 B3; EP 3 884 162; CN 113 302 399 B; DE 10 2018 129 633.9 B3; EP 3 884 160; CN 113 272 553 B; DE 10 2018 129 634.7 B3; EP 3 884 527; DE 10 2018 129 635.5 B3; EP 3 762 165; DE 10146 793.1; EP 1 354 135 B1; US 7,698,818 B2; DE 10 2011 051 486 B4; EP 2 726 740 B1; US 9,404,492 B2; CN 103 732 921B; EP 2 640 977 B1; US 10,012,220 B2; CN 103 348 141 B; HK 1 185 648 B.

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