

Eksigent NanoFlow Metering Systems

Simple, effective metering at flow rates as low as 1 nL/min

Introduction

As drug discovery assays migrate to smaller and smaller volumes to increase throughput, the limits of available metering systems are being reached. Conventional pumps have limited accuracy at flow rates less than 1 microliter per minute, forcing compromises in the metering of reagents and samples in micro-scale assays. To address this problem Eksigent has developed the NanoFlow Metering System, based on Eksigent's proprietary Microfluidic Flow Control (MFC) technology. NanoFlow Metering Systems provide unprecedented levels of precision at flow rates as low as 1 nL/min to 10 µL/min, and can handle system backpressures to 3,000 psi. NanoFlow Metering Systems are assembled as multiplexed instruments integrating from 2 to 8 channels, and each channel can incorporate as many as 16 separate reagents for sequential metering. Applications include reagent metering for microscale synthesis, affinity separations, reagent addition for nanoscale protein crystallography, and flow generation and control for lab-on-a-chip applications.

Typical Applications

- Protein sample preparation: cleanup, desalting, affinity binding, tagging
- Microscale synthesis for combinatorial chemistry
- Cell manipulation
- Bead-based assays
- Protein crystallography
- Lab-on-a-chip systems

Simple interfaces provide an easy plug-in solution

Fluid connections between devices are a critical challenge in microfluidics. To make microfluidics user friendly, sample loading utilizing existing liquid handling equipment is a necessity. Eksigent has engineered the NanoFlow Metering System to work with conventional injection valves for sample loading. Standard low-volume capillary fittings are employed for connections to detectors, chips, and other devices. This simple, effective connection method means that a NanoFlow Metering System can be up and running quickly. Additionally, commercial autosamplers and liquid handling systems can be utilized for sample loading. NanoFlow Metering Systems can be interfaced to customer-supplied chips, or Eksigent can supply customized chips or packed capillaries.



2-channel NanoFlow Metering System. Systems are available in 2-channel through 8-channel configurations, and can handle flow rates from 1 nL/min to 10 µL/min

Benefits of the NanoFlow Metering System

- Precise control at nanoliter-per-minute flow rates improves assay resolution
- Rapid flow response enables precise manipulation of cells and beads
- Simple interfaces allow the system to interface with standard liquid handling equipment such as autosamplers
- Compact size allows multiplexing to increase throughput

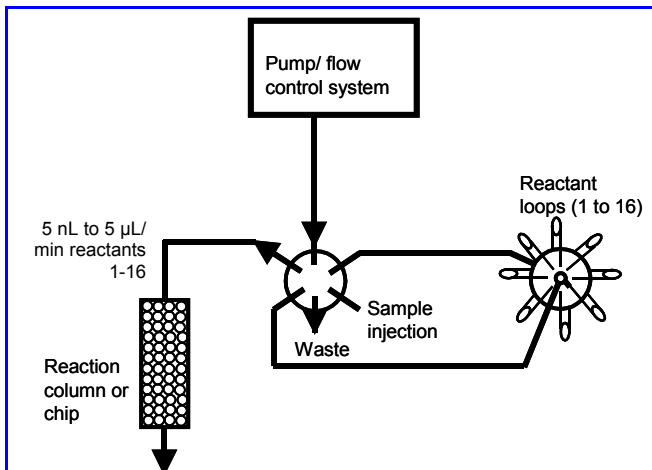
NanoFlow Metering System Specifications

Feature	Specification
Channels	2 and 8 channel systems available
Flow rate range	5 nL/min to 5 uL/min, dynamic range from any individual pump 100:1
Reagent compatibility	All reagents that are compatible with 316L stainless steel and PEEK may be pumped
Backpressure	Systems handle from 0 to 3,000 psi
Reagent and sample loading	Injection valves with sample loops, with optional automation and autosampler interface
Reagents available per channel	Up to 16 reagents can be loaded and metered sequentially for each pump channel
System control	Computer with simple graphical user interface
System outlet connections	Low-volume PEEK capillary fittings

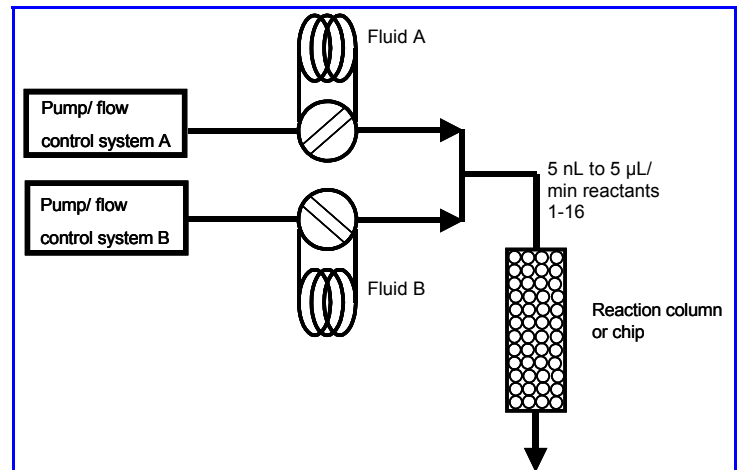
Customized solutions

Eksigent's flexible NanoFlow Metering platform is easily customized to meet specific requirements. Whether your application requires automation of multiple reagents added in a precise sequence, or an autosampler interface for high throughput applications, the NanoFlow System can be adapted to meet your needs. Two possible system configurations are shown below, and numerous other configurations are possible. Contact us to see how a system can be integrated easily into your microfluidics project.

Sample application configurations



Multistep reaction configuration. Multiple reagents can be preloaded and pumped sequentially from a single NanoFlow Metering System channel. Applications include protein affinity binding, tagging, and bead-based assays.



Multicomponent reactor configuration. Two or more channels can be connected to a reaction column or chip to perform precise metering of samples, reagents, and buffers. Applications include gradient reactions for protein binding and elution, combinatorial synthesis, and other lab-on-a-chip applications.

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