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Technical Note

Mirus Evo™ Nanopump

Mirus Evo Nanopump: accurate shear stresses / flow rates for cell analysis

Mirus Evo is a patented, precision, microfluidic, 8-channel syringe pump for cell analysis under shear flow mimicking physiological flow in the human vasculature.

Includes MultiFlow8, a manifold that enables the flow from the Mirus Evo to be split equally into 8 separate tubes to conduct 8 assays simultaneously in the Vena8 range of biochips, resulting in higher throughput with this 8-channel syringe pump. Mirus Evo is PC-controlled by VenaFluxAssay software.



Mirus Evo nanopump and MultiFlow8

Performance and Technical Specifications:

Performance specifications	
Includes MultiFlow8	Capable of executing up to 8 assays in parallel in Vena8 biochips resulting in an 8-channel syringe pump
Shear stress range for cell suspension	0.05–10 dyne/cm ² ; steps of 0.05 dyne/cm ² (100 μL syringe)
Shear stress range for whole blood*	2.25–450 dyne/cm ² (1 mL syringe)
Volumetric flow rates	100 nL/min–20 μL/min (100 μL syringe) (at 20°C, 2Hz, with air under 10psi pressure)
Dead volume	600 μL
Sample volume increments	Freely adjustable
Valve switching time	30 ms max
Working pressure	30 psi–2 bars max
Linear velocity range**	10 μm/s–10 cm/s
Flow direction	reversible

*Considering human whole blood with a viscosity of 4.5 cP.

**Given for the flow of distilled water in a microcapillary with dimensions: 400 μm (W) x 100 μm (D) x 20 mm (L).

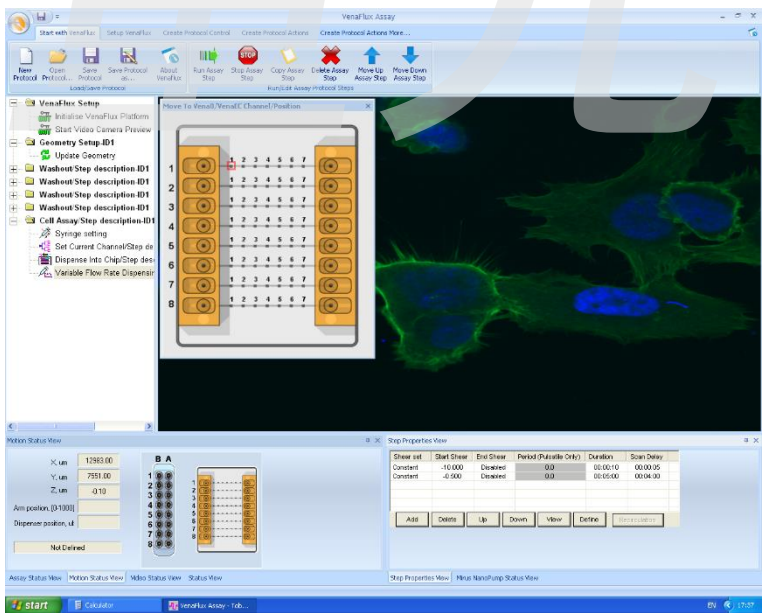
Performance specifications	
Sample volume aspiration accuracy	±1%
Shear stress accuracy	±0.5%
Sample volume aspiration precision	<1% CV
Shear stress precision	<0.5% CV

Technical specifications MultiFlow8	
Software control	Plug and play connection to the Mirus Evo nanopump and controlled by VenaFluxAssay software
Features	Splits flow from 1 input to 8 outputs; 8 outputs fully controlled for single to multiple assays
Dead volume	<2 mL
Max pressure	30 psi–2 bars max
Dimensions	140 mm (H) x 35 mm (D) x 140 mm (W)
Weight	<0.5 kg
Power requirements	24 V, max 12 W

Technical specifications	
Software control	Integrated VenaFluxAssay software
Dimensions	84 mm (W) x 180 mm (D) x 192.5 mm (H)
Weight	~2 kg
Power requirements	110 / 220 V – 50 / 60 Hz – 60 W
PC requirements	USB port, Windows 7 and above operating system versions



Mirus Evo nanopump and MultiFlow8 connected to a Vena8 biochip on an inverted microscope



VenaFlux Assay software 2.3.a which controls the Mirus Evo nanopump