



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).

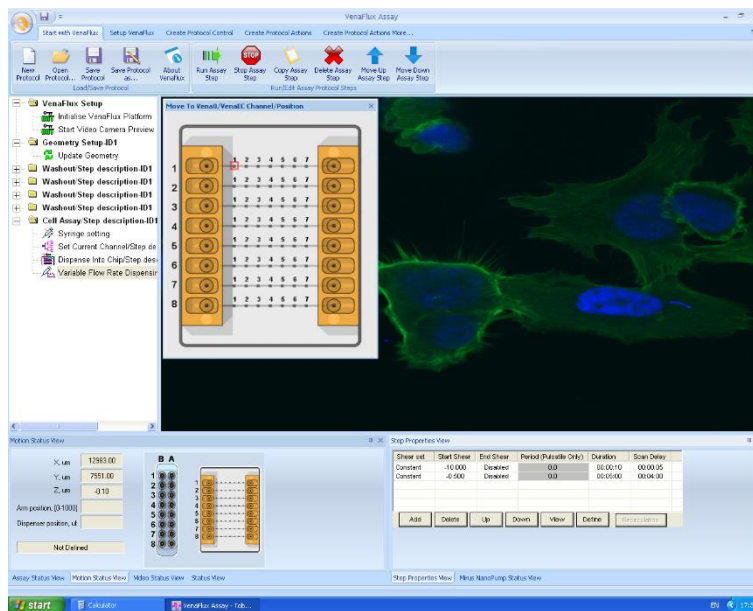
| Performance specifications | |
|------------------------------------|----------|
| Sample volume aspiration accuracy | ±1% |
| Shear stress accuracy | ±0.5% |
| Sample volume aspiration precision | <1% CV |
| Shear stress precision | <0.5% CV |

| 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



VenaFluxAssay software 2.3.a which controls the Mirus Evo nanopump