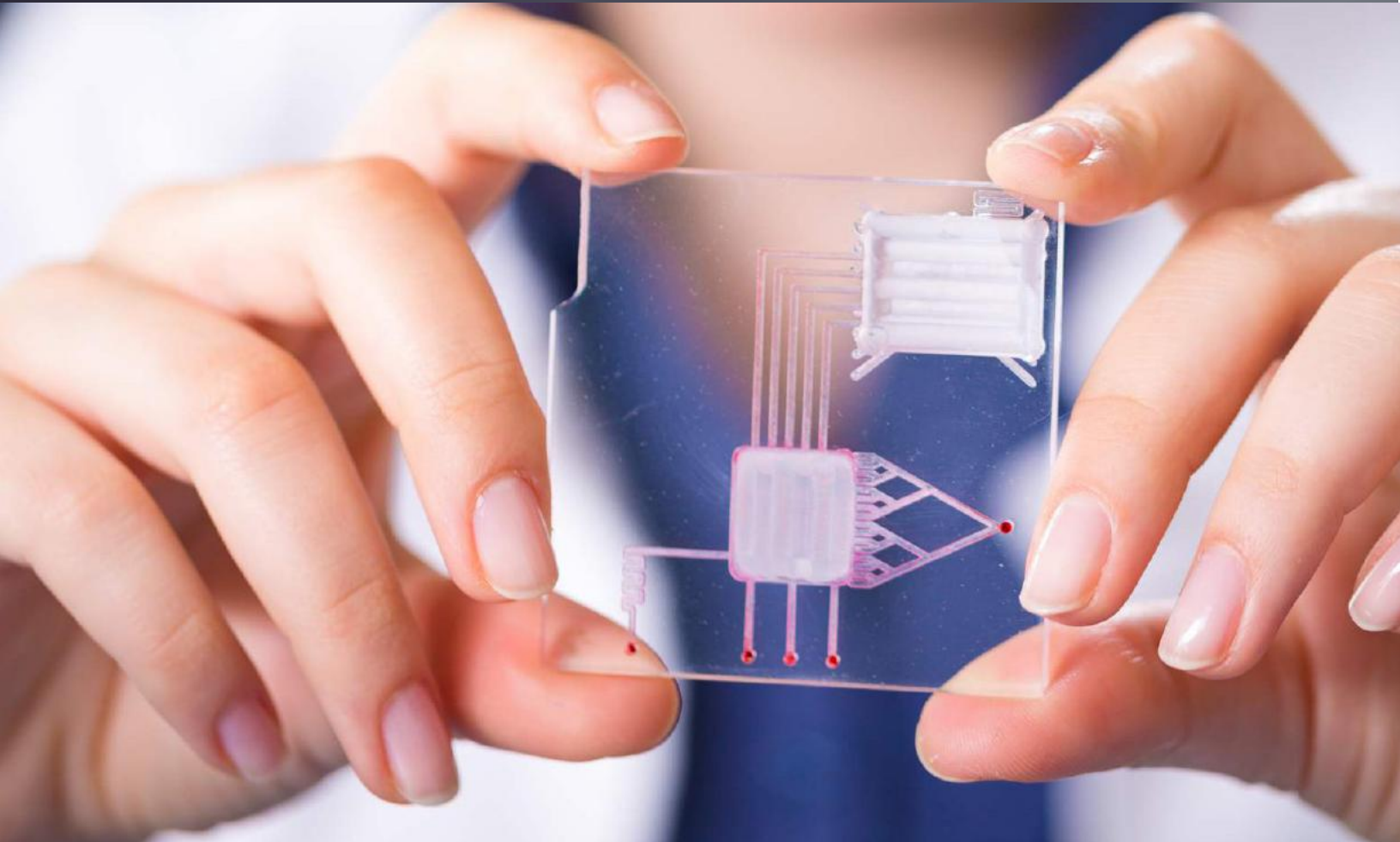


# Syringe Pumps for Microfluidics

Pump 11 Elite • PHD ULTRA™ • Pump 33 DDS • Nanomite



# Microfluidics — Directing the Flow of the Future



Microfluidics is an interdisciplinary convergence of biotechnology, chemistry, physics and engineering that is revolutionizing research capabilities for a vast array of applications.

It is the science of precisely controlling and manipulating the behavior of minute flows of liquids, in the range of microliters to picoliters—in sub-millimeter channels and other structures—to perform a variety of experiments and functions.

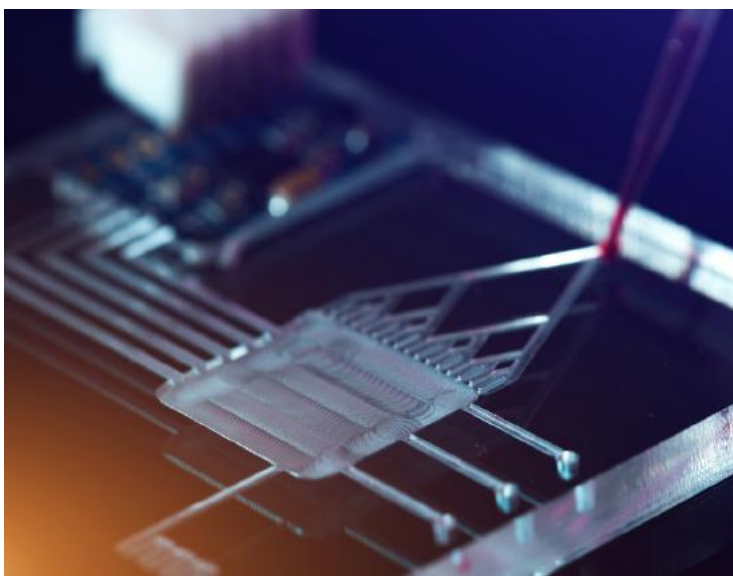
In fact, microfluidics is front and center—directing the future of fluidics research.

# Harvard Apparatus Pumps in the Field

## Helping to Satisfy Vast and Diverse Microfluidics Applications

Harvard Apparatus offers a variety of proven syringe pumps that provide the exacting performance and flow stability requisite to success in microfluidics research. Our syringe pumps are cited in thousands of research publications satisfying vast and diverse applications.

Choose from single and multi-channel volume and pressure-controlled pumps with flow rates from picoliters to milliliters. We can provide standard models, specials and OEM modules designed to meet your microfluidic application needs. In addition to pumps we carry syringes, connectors and tubing. Please contact our Technical Support team to help choose the correct syringe pump and accessories for your application.



caption here

### Sample Applications

- Lab-on-a-Chip
- Organ-on-a-Chip
- DNA analysis
- PCR amplification
- Ultra-high throughput biological assays
- Cell sorting
- Point-of-Care diagnostics
- Proteomics
- Biosensors/BioMEMS
- Microreactors
- Droplet formation

# Harvard Apparatus Microfluidics Syringe Pumps

## Quality Flow, High Accuracy & Precision, Flexible & Feature Rich

With thousands of high-quality syringe pumps in use, you can count on Harvard Apparatus syringe pumps to provide smooth, accurate repeatable flow for your microfluidic experiments. Harvard apparatus syringe pumps are designed with the linear force to provide flow into the smallest of channels without stalling.

- Choose from Infusion Only, Infusion/Withdrawal, Programmable, Standard and Remote models.
- Adjustable linear force up to 200 lb (90.7 kg), model dependent.
- Reduce error risk with smooth, precise flow control—down to the pl/min.
- Set up and store multiple, multi-step programs with a smart, color touchscreen display.
- CE, ETL (UL, CSA), WEEE, EU RoHS and CB Scheme compliant.

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## Pump 11 Elite

Key selling point language for this pump.



**Accuracy\*:**  $\pm 0.35 - 0.5\%$

**Syringe Size:**

\*Single 0.5  $\mu$ l – 60 ml

\*Dual 0.5  $\mu$ l – 10 ml

**Flow Rates:**

**Single Syringe\***

0.54 pl/min – 88.4 ml/min

**Dual Syringe\***

0.54 pl/min – 26.02 ml/min

(\*model dependent)

## PHD ULTRA™

Key selling point language for this pump.



**Accuracy:**  $\pm 0.25\%$

**Syringe Size:**

0.5  $\mu\text{l}$  – 140 ml

**Flow Rates:**

1.5 pl/min – 216 ml/min

## Pump 33 DDS

Key selling point language for this pump.



**Dual Independent Syringe Pump**

**Accuracy:**  $\pm 0.25\%$

**Syringe Size:**

0.5  $\mu\text{l}$  – 60 ml

**Flow Rates:**

1.02 pl/min – 106 ml/min



## Nanomite

Key selling point language for this pump.



**Accuracy\*:**

**Stereotaxic compatible**

**Accuracy:** ±0.5%

**Syringe Size:** 0.5 µl – 1 ml

**Flow Rates:**

3.66 pl/min – 3.82 ml/min

0.54 pl/min – 26.02 ml/min

(\*model dependent)

MICROFLUIDIC SYRINGE PUMPS FROM HARVARD APPARATUS	CATALOG #
Pump 11 Elite Single Syringe Infuse Only	70-4500
Pump 11 Elite Dual Syringe Infuse Only	70-4501
Pump 11 Elite Single Infuse/Withdraw/Programmable	70-4504
Pump 11 Elite Dual Infuse/Withdraw/Programmable	70-4505
Pump 11 Pico Plus Elite Single Infuse/Withdraw/Programmable	70-4511
Pump 11 Pico Plus Elite Dual Infuse/Withdraw/Programmable	70-4506
Pump 11 Elite Nanomite Infuse/Withdraw/Programmable	70-4507
PHD ULTRA™ Dual Infuse Only*	70-3005
PHD ULTRA™ Dual Infuse/Withdraw/Programmable*	70-3007
PHD ULTRA™ 4400 Infuse/Withdraw/Programmable*	70-3010
PHD ULTRA™ Constant Pressure Dual (I/W/P)	88-3015
PHD ULTRA™ Constant Pressure 4400 (I/W/P)	88-3016

\*Available in remote configuration. The PHD ULTRA™ Remote Pumps consist of a control unit and syringe pumping mechanism all connected via a 30-ft RS-485 (IEEE-1394) cable.

With more than 100 years of success behind us and a proven track record of designing and manufacturing high quality reliable syringe and peristaltic pumps, only Harvard Apparatus has the scientific depth and fluidics knowledge to recommend the right pump and accessories for your application. Our superior technical experts are available to assist you from start to finish. Harvard Apparatus invented the lead screw based syringe pump in the 1950's and introduced the first microprocessor pump, the now legendary Pump 22, in the 1980's. Our syringe pumps are so accurate, that even at low flow rates they have become the standard for mass spectrometry calibration, physiological research and anywhere accurate volumes must be delivered.



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