

# Syringe pumps

Fnm syringe pumps are designed as a low cost, 2 or 10 syringes. This pump can hold syringes of any make from 10µl to 50ml. This syringe pumps are ideal for delivering accurate and precise amounts of fluids for a multitude of the syringe pump applications including electrospinning, infusing calibrate into a mass spectrometer or reaction chamber, long term drug infusions to animals and general infusion applications.

Fnm syringe pumps are known for their outstanding reliability and performance. The HOM series syringe pumps give you the most cost effective solution for infusing fluids. Alternatively, the HSM series gives you the advance features with USB interfaces. The diameter of the syringes is entered via the keypad and the internal microprocessor drives a precision stepper motor to produce accurate fluid flow.

## Features:

### Bright Display and Easy-To-Use Interface:

A four-line 20 character LCD display along with 20 or 25 membrane keys makes this a most attractive but powerful, easy-to-use syringe pump. A bright, easy to read, can be easily read from across the lab. A target volume key makes it easy to dispense a set volume. The numerical keys utilize the familiar 'telephone' layout.

### Two Modes of Operation, Constant Rate and Volume:

Pump will operate continuously in RATE mode or accurately dispense a specific amount of fluid in VOLUME mode.



Model	SP2000HSM	SP2000HPM	SP1000HSM	SP1000HPM	SP1000HOM
Body	Metal	Metal	Metal	Metal	Metal
Max. Syringe No.	10	10	2	2	2
Input Voltage	100-240 AC				
Display (line * Character)	4 * 20	4 * 20	4 * 20	4 * 20	4 * 20
Keypad (switch numbers)	25	25	25	25	20
Internal Programming	✓	✓	✓	✓	-
Computer Control	✓	-	✓	-	-
Autofill	✓	✓	✓	✓	-
Max. syringe size (ml)	50	50	50	50	50
Min. Injection rate (µl/h)	0.5	0.5	0.5	0.5	0.5
Max. injection rate (ml/h)	640	640	1000	1000	1000
Pedal Resolution per step (nm)	10	10	10	10	10
Weight (kg)	4.3	4.3	4	4	4



### Smooth Flow and Lowest Flow Rates

A new micro stepping motor and control software give the lowest flow rates ever, down to 1  $\mu\text{l}/\text{hour}$ . It is also incredibly quiet so it won't disturb your experimental subjects. Enhanced micro stepping pump profiles deliver very smooth and consistent flow.

### Nonvolatile Memory

The pump remembers its last syringe size, flow rate used and configuration settings.

### Versatility

HPM syringe pump meet every need, whether it is simple infusion, infusion and withdrawal, or programming capabilities.

### Infuse Only (HOM series):

This pump is suitable for applications that require high accuracy and low rates but, do not need to withdraw fluid and do not need programmability.

### Infuse/Withdraw, Programmable (HPM and HSM series):

The infuse/withdraw has identical performance to the infusion only model (above) but can also withdraw (refill). The Fnm Programmable pump has the most advanced programming functions and yet is very easy to use. The pump can store up to 10 sequences in volume and time modes. Programs are stored in non-volatile memory. The HSM series programmable pumps may also be programmed using windows software.

### Remotely Controlled Syringe Pump

Use the remote pump in hazardous environments where the researcher is safer when distanced from the material being pumped. HSM series pump has a USB cable that allows the pumping mechanism to be located remotely from the control box.

### High Pressure Syringe Pumps

Every version of the Fnm Pump is now available optional with a stronger motor (13 kg.cm) that can provide more force. These pumps are ideal when working with the viscous fluid or when driving multiple syringes. The standard force syringe pumps use motor (9 kg.cm)

## Program Description

The programming functions of this pump provide powerful capabilities for advanced experiments. While in program mode this pump can perform the following tasks at a predetermined time or when prompted by a signal from an external device:

- start or stop pumping
- change pumping direction (infuse-withdraw)
- change flow rates
- pump a precise volume and stop
- pause operation
- ramp up or down flow rates
- Inject in a desired formula

In program mode the above tasks can be linked together into powerful programs to simplify your automation projects.

### Specifications:

Number of syringe: Up to 2 (SP1000) / Up to 10 (SP2000)  
 Syringe/Size Holder For: Plastic, metal or glass  
 Minimum Flow Rate Range: 1  $\mu\text{l}/\text{hr}$  with 10 $\mu\text{l}$  syringes  
 Maximum Flow Rate Range: 1 liter/hr with 50 ml syringes  
 Display: 4 line, 20 character LCD display.  
 Nonvolatile Memory: Stores diameter, rate and settings.  
 Input Power: 110-240V AC, 50-60 Hz.  
 Package dimantion: 20 \* 26 \* 24 cm  
 Weight: 4 kg  
 Garanty: 1 year

### Applications:

this system is suitable for all application requires a low injection rate. Some of these applications include:

- Cell injection
- Controlled drug injection
- Electrospinning
- Controlled Reactive Injection into the
- Reactor
- Lab on a Chip
- ...