

# LABORATORY FIBER NANO MACHINE

Lab – FNM 401

Laboratory **Fiber Nano Machine** (Lab- FNM 401) is a lab-scale electrospinning machine to prepare polymeric/carbon/ceramic nanofibers with diameter range of 50 nm to a few microns. The machine mainly consists of metallic body, syringe pump, spinneret system, collector system and high voltage power supply. Two different types of the Machine are available: Standard and dual pump model (Side by Side Electrospinning).

In side by side Electrospinning system, there are two syringe pumps on both sides of the rotating collector drum, making the system to consist of 2 syringe pumps, 2 scan systems, 2 distance adjusters and 2 high voltage power supplies. In these systems two different materials could be electro spun simultaneously. Furthermore, the system makes it possible to electro spun polymeric material from one side and additive materials, such as medications, from the opposite side, producing composite nanofibers containing desired components. Therefore, it is suitable for pharmaceutical, medicinal and biological. applications.

This machine employs a touch screen panel for controlling electrospinning parameters. The machine provides excellent safety schemes for the users with respect to the handling of high voltage power supply and chemical solvents.



## High voltage power supply

Model: HV35P OV

Max. output voltage: 35 kV

Power: 35 watt

Voltage monitoring: Digital,

Accuracy: 0.1 kV

Body: Durable metal casing

Two high voltage power supplies are installed for dual pump series



## Main Features

- Advanced safety features
- Reliable performance
- Modular design
- 4.3" touch screen HMI panel for controlling process parameters
- Emergency button to stop machine in any unexpected situation
- Easy use and maintenance
- Dual syringe pump model is available
- Core-Shell nanofibers can be produced by coaxial nozzle.

## Spinneret

Number of syringes: Standard: 1 or 2; Dual pump: Up to 4 syringe;  
Configuration: Horizontal (No need for hose)  
Scanning rate: 0-30 mm/s  
Scanning range: 0-30 cm  
Syringe pump injection rate: 10 µl/h to 500 ml/h  
Usable syringe size: 1-25 mm (Inner Diameter)  
Accessories (Optional): Co-axial nozzle with tube

## Dual pump series:

- 2 syringe pumps (Up to 4 syringes can be used)
- 2 scan systems
- 2 distance adjuster

## Collector

Type: Rotating drum (wire, cylinder, mandrel and disk collectors are optional)

Material: Stainless steel

Rotation speed: 300-3000 RPM

Spinning distance: 5-20 cm

## Size:

Drum: 8(∅) cm × 30(L) cm

Plate: 25(L) cm × 20(W) cm

Wire (Optional): 8(∅) cm × 25(L) cm

Disk (Optional): Diameter: 19.8 cm

Mandrel (Optional): Length: 25 cm; Diameter: 2, 4, 6, 8 and 10 mm

Attachable to negative high voltage power supply up to -20 kV (Optional)



## Control

Type: PLC

HMI: 4.3" touch screen

Control:

- Start and end position of the nozzle(s)
- Injection rate of syringe pump(s)
- Electrospinning distance(s)
- Electrospinning time
- ON/OFF timer for exhaust fan
- Drum ON/OFF switch (RPM controller) in standard series, and RPM control from HMI in dual pump series
- Temperature control
- Humidity indicator (dual pump series)
- Alarm after desirable volume of injection and after finishing the solution in syringe (after the operation of syringe pump switch)



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