LABORATORY FIBER NANO MACHINE

Lab – FNM 401

Laboratory **F**iber **N**ano **M**achine (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 nonofibers can be produced by coaxial nozzle.

Spinneret
Number of syringes: Standard: 1 or 2; Dual pump: Up to 4 syringes
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(ø) cm × 30(L) cm
Plate: 25(L) cm × 20(W) cm
Wire (Optional): 8(ø) 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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