

NanoSpin 20



Multi-Pump Lab-Scale Electrospinning is a electrospinning machine used to fabricate nanofibers with controlled blending of two or more polymer solutions. This process involves the use of two pumps to individually deliver different polymer solutions to different nozzles for simultaneous electrospinning. The two solutions combine and blend during the process, forming composite or blended nanofibers. Also both electrospinning and electro spraying processes can also be carried out at the same time using this unit. In addition, the machine can be equipped with a third syringe pump on top of the collector, allowing for the concurrent electrospinning of three different solutions.

Multi-Pump Electrospinning has found applications in various fields, including tissue engineering, drug delivery, and filtration. The process is also used to create nanofiber mats with tunable properties, such as mechanical strength, surface area, and porosity, making it a versatile technique in producing advanced materials. Total Electrospinning parameters such as injection rate of polymeric solution, electrospinning distance, collector drum rotation speed, working temperature and humidity are controlled by a panel on this machine.



Main Features

- Advanced safety features
- Reliable performance & Modular design
- 7" touch screen HMI panel for controlling process parameters
- Easy use and maintenance
- Emergency button
- 3 (2+1) syringe pumps (Up to 6 (4+2) syringes can be used)
- 3 (2+1) scan systems on three side of the collector
- 3 (2+1) distance adjusters
- 3 high voltage power supplies (2 positive & 1 negative Polarity)
- Climate Control system
- Two direct injection and one with low dead volume solution
- Core-shell nanofibers can be produced by coaxial nozzle
- Ability to use different types of collectors
- Ability to add a third injection system on top of the collector



Collector

- Type**
 - Negative Cylindrical Drum & Plate collector,
 - Mandrel, Single & Multi Wire, Radial, Needle, Wheel & Disk collectors are optional
- Material**
 - Stainless steel
- Rotation speed**
 - 300-3000 rpm (Cylindrical drum)
- Spinning distance**
 - 5-20 cm
- Size**
 - Negative Cylindrical: 10(∅) cm × 30(L) cm
 - Plate: 30(L) cm × 30(W) cm
 - Wire (Optional): 8(∅) cm × 25(L) cm
 - Single wire (Optional): Tensioned cable (20+ μm cables)
 - Needle Collector (Optional): Replaceable needle
 - Disk (Optional): Diameter: 3,5 & 10 cm
 - Radial (Optional): Diameter: 2, 3, and 5 cm
 - Wheel Collector (Optional): Diameter: 20cm Thickness: 1,2 & 4 cm
 - Mandrel (Optional): Length: 25 cm Diameter: 2, 4, 6, 8 and 10 mm
- Nanofiber coverage area**
 - 30*30 cm (Cylindrical drum)
- Attachable to negative high voltage power supply up to -35kV for all Collectors (Optional)



General

- Cassis**
 - Metallic body (Aluminum frames)
 - On wheels
 - Diffuse LED lighting
- Input power**
 - 100-240 V AC/50-60 Hz
- Safety**
 - Voltage cut-off In case of door opening
- Dimensions (L×W×H)**
 - 152 cm × 95 cm × 100cm
- Weight**
 - 225 KG



High voltage power supply

- Model**
 - HV35 Positive
 - HV35 Negative
- Max. output voltage**
 - 35 kV
- Power**
 - 30 Watt
- Voltage monitoring**
 - Digital, Accuracy: 0.1 kV
- Two positive high voltage power supplies connected to syringe pumps**
- One negative high voltage power supply connected to collector (Optional)**



Main control

- HMI**
 - 7" touch screen
- Type**
 - programmable logic controller (PLC)
- Control detail**
 - Start and end position of nozzle(s)
 - Injection rate of syringe pump(s)
 - Electrospinning distance(s)
 - Electrospinning time
 - ON/OFF timer for exhaust fan
 - Rotational speed control of collector from HMI
 - Temperature control
 - Humidity control
 - Alarm after desirable volume of injection and after finishing the solution in syringe



Climate Control system

- Ventilation**
 - A programmable fan adjustable by HMI panel
- Heating System**
 - Adjustable from room temperature up to 45°C, ± 1°C via HMI panel (Optional)
- Cooling System**
 - Temperature down to 19°C, ± 1°C (Optional)
- Humidifier**
 - Up to 80% (Optional)
- Dehumidifier**
 - Dehumidifier down to 10% ± 5% (Optional)
- Support Condition**
 - Room Temp.: 20-30°C
 - Room Humidity: 20-70%



Spinneret

- Number of syringe pumps**
 - Two syringe pumps
 - A third syringe pump is optional
- Number of syringes**
 - Up to 6 (4+2) syringes
- Configuration**
 - Horizontal (No need for hose)
 - parallel to collector
 - The third syringe (optional) is vertical and above the collector (need for hose)
- Scanning rate**
 - 0-30 mm/s , adjustable
- Scanning range**
 - 0-30 cm, adjustable
- Syringe Pump Injection Rate**
 - 10 μl/h to 500 ml/h
- Usable syringe size**
 - 1-25 mm (Inner Diameter)
- Accessories**
 - Co-axial nozzle with tubing (Optional)