# NanoSpin 10 (Single-Pump Lab-Scale Electrospinning)

The **Single-Pump Lab-Scale Electrospinning Machine** is a high-performance apparatus designed for the precise fabrication of polymeric, carbon-based, or ceramic nanofibers, with diameters ranging from 10 nm to a few microns. Engineered specifically for laboratory environments, this system is an essential tool for research, development, and small-scale production.

The core setup includes a high-voltage power supply, a syringe with a needle, a linear motion system, and a stationary or rotating collector. The syringe holds the polymer solution, which is dispensed through the needle under high voltage to create a continuous nanofiber jet. These fibers are then deposited onto the collector surface to form uniform nanofiber mats.

This lab-scale unit features a user-friendly control panel that allows precise adjustment of key electrospinning parameters, including:

- **Polymer injection rate**
- **Electrospinning distance**
- **Collector drum rotation speed**
- **Climate control (temperature and humidity)**
- **Operation time**

Advanced safety mechanisms are integrated to ensure secure handling of high-voltage components and chemical solvents, making it ideal for both novice and experienced researchers.

## Main Features

- **7” touch-screen HMI panel** for precise control
- **Emergency stop button** for enhanced safety
- **User-friendly operation and maintenance**
- **1 syringe pump** (supports up to 2 syringes)
- **1 automated scan system**
- **1 automated distance adjuster**
- **1 positive high-voltage power supply**
- **1 negative high-voltage power supply**
- **1 Red Laser** to observe the nanofibers jets
- **Temperature and humidity display**
- **Without Dead Volume Solution** with direct injection
- **Compatibility with multiple collector types**
- **Programmable ventilation fan**
- **Optional Atmospheric Control System**

## Collector

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| **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(ø) cm × 30(L) cm<br>▪ Plate: 30(L) cm × 30(W) cm<br>▪ Multi Wire (Optional): 8(ø) cm × 25(L) cm<br>▪ Single wire (Optional): Tensioned cable (20+ µm cables)<br>▪ Needle Collector (Optional): Replaceable needle<br>▪ Disk (Optional): Diameter: 3,5 &10 cm<br>▪ Radial (Optional): Diameter: 2, 3, and 5 cm<br>▪ Wheel Collector (Optional): Diameter: 20cm Thickness: 1,2 & 4 cm<br>▪ 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

## General

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|---|---|
| **Cassis** | ▪ Metallic body (Aluminum frames)<br>▪ On wheels<br>▪ Diffuse LED lighting |
| **Input power** | ▪ 100-240 V AC/50-60 Hz |
| **Safety** | ▪ Voltage cut-off Incase of door opening |
| **Dimensions (L×W×H)** | ▪ 90 cm × 95 cm × 87 cm |
| **Weight** | ▪ 100 KG |

## High voltage power supply

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| **Model** | ▪ HV35 Positive<br>▪ HV35 Negative |
| **Max. output voltage** | ▪ 35 kV |
| **Power** | ▪ 30 Watt |
| **Voltage monitoring** | ▪ Digital, Accuracy: 0.1 kV |

**One positive high voltage power supplies connected to syringe pumps**

**One negative high voltage power supply connected to collector**

## Main control

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

## Climate Control system

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| **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<br>▪ Room Humidity: 20-70% |

## Spinneret

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| **Number of syringe pumps** | ▪ One syringe pump |
| **Number of syringes** | ▪ Up to 2 syringes |
| **Configuration** | ▪ Horizontal (No need for hose) |
| **Scanning rate** | ▪ 0-30 mm/s , adjustable |
| **Scanning range** | ▪ 0-30 cm, adjustable |
| **Syringe Pump Rate** | ▪ 50 µl/h to 500 ml/h |
| **Usable syringe size** | ▪ 1-25 mm (Inner Diameter) |
| **Accessories** | ▪ Co-axial nozzle with tubing (Optional) |