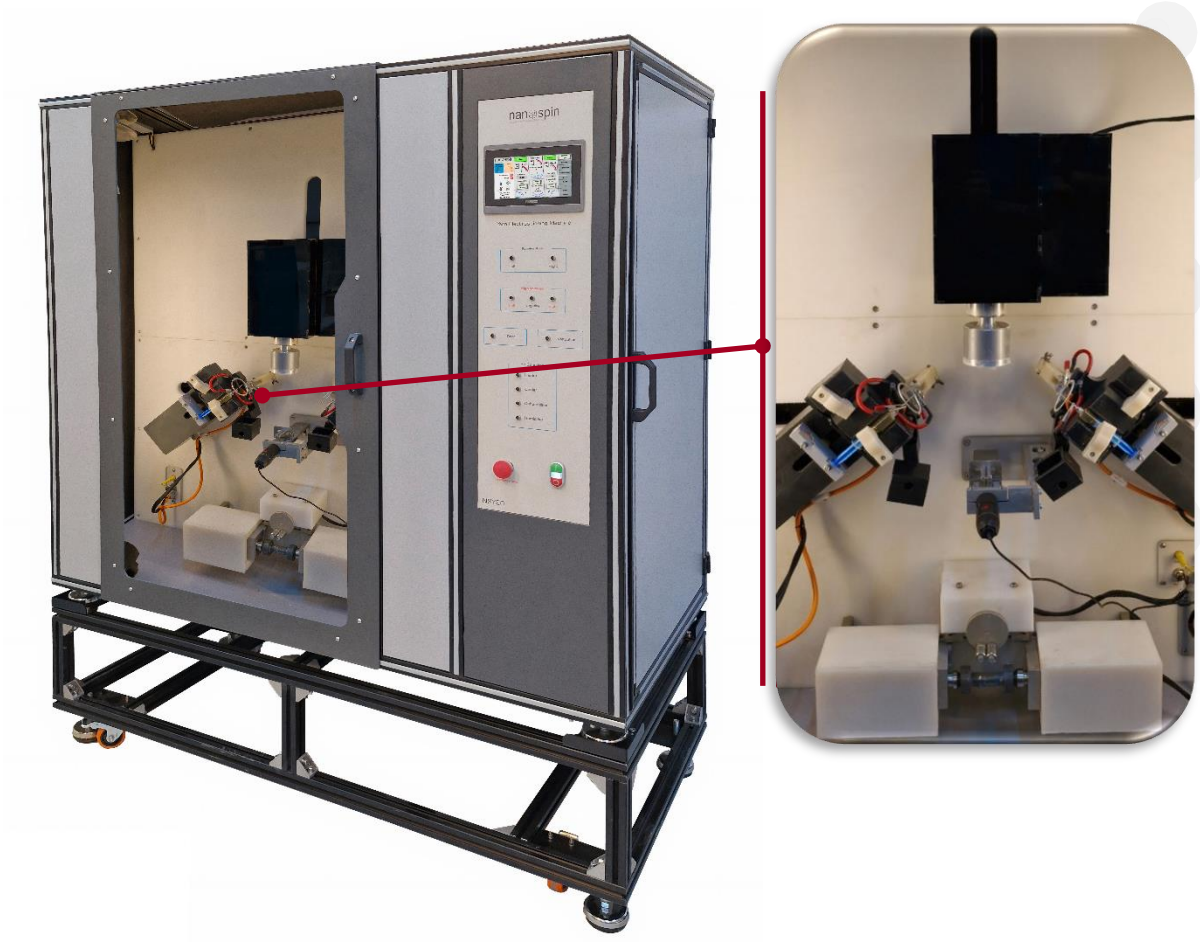
NSY 20



NanoSpin presents an advanced yarn electrospinning system engineered for the direct production of yarns from electrospun nanofibers — including suture-grade yarns. Designed for research, development, and pilot-scale manufacturing, this machine offers exceptional control, precision, and adaptability.

From biomedical threads and surgical sutures to smart textiles and functional nanofiber-based yarns, the system empowers researchers and innovators to explore new frontiers in fiber technology.

The NanoSpin system utilizes dual electrospinning nozzles with configurable electrical charges (either matching or opposing), targeting a rotatable collector specifically designed for yarn formation. The collector's angle is fully adjustable from +45° to -45°, enabling fine-tuned control over fiber alignment and yarn tension.

Two collector configurations are available — funnel and pipe — to accommodate different yarn fabrication strategies. As nanofibers are drawn and deposited, a synchronized winding unit continuously pulls and twists the fibers into a uniform yarn, ready for various advanced applications.

An integrated real-time camera monitoring system ensures consistent yarn quality throughout the production process.

Main Features

- Specialized for electrospun yarn, including surgical sutures
- Convertible to dual-pump for standard fiber production
- Funnel or pipe collectors suit various yarn profiles
- Adjustable collector angle controls yarn direction and tension
- Dual-nozzle setup enables uniform or opposing charges
- Two syringe pumps—up to four syringes used
- Camera monitors yarn formation before winding begins
- X, Y, Z adjustments provide precise nozzle control
- Three high-voltage supplies: two positive, one negative
- Automatic yarn winding with optional twisting function
- 7” touchscreen manages all system control parameters
- Core-shell nanofibers via coaxial nozzle configuration
- Safety features: emergency stop, voltage cut-off, enclosure
- Optional system regulates temperature and humidity conditions

Yarn Formation

Collector Shapes	Funnel and Pipe (interchangeable)
Collector Diameters	4 cm, 7 cm, 10 cm, 14 cm
Collector Rotation	20–500 rpm
Winding System	Simultaneous winding and scanning, adjustable speed
Winding Rate	0.1 – 100 cm/min
Yarn Monitoring	Real-time camera view on monitor

Pumps and Collector Position

Collector Angle	±45°, adjustable
X-Axis (Collector Distance)	0–30 cm, automated, 0–50 mm/s
Y-Axis (Nozzle Distance)	0–20 cm, separate & automated
Z-Axis (Nozzle Angle)	±90°, separate & automated

General

Cassis	Metallic body (Aluminum frames) On wheels Diffuse LED lighting
Input power	100-240 V AC/50-60 Hz
Safety	Voltage cut-off Incase of door opening
Dimensions (L×W×H)	155 cm ×75 cm ×155cm
Weight	270 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

Main Control

HMI	7″ touch screen
Type	Programmable logic controller (PLC)
Control detail	Injection rate of syringe pump(s) Electrospinning distance(s) Position of nozzle(s) Position of collector spinning time Collector speed control Temperature control Humidity control winding speed control ON/OFF timer for exhaust fan 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
Number of syringes	Up to 4
Configuration	Horizontal (No need for hose) Parallel to collector
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)