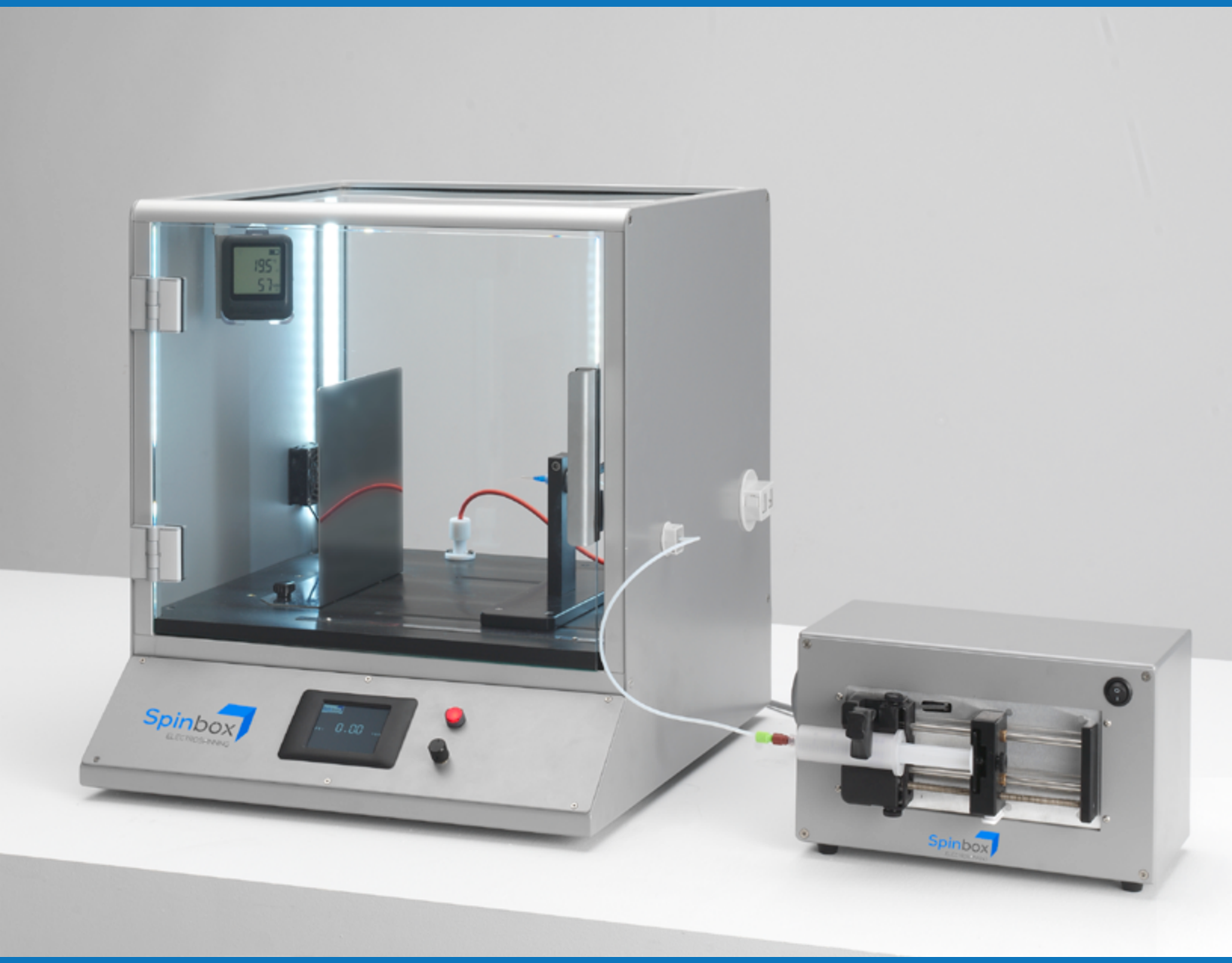
nanoScience Instruments



Spinbox

by Bioinicia

Electrospinning & Electrospraying System

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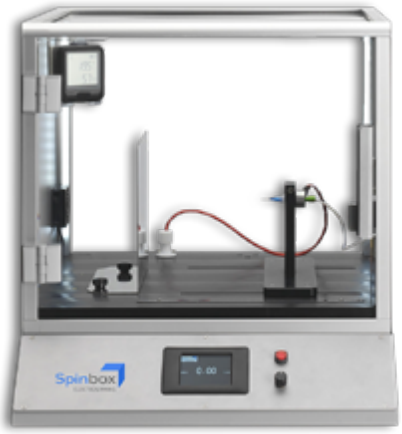
Spinbox Introduction



Simple, safe, and configurable

Spinbox® is the ideal benchtop electrospinning and electrospraying system. It offers a cost-effective and user-friendly entry point into professional quality electrospinning instrumentation. Spinbox offers several advantages compared to home-built units, including:

- **Simplicity:** Thoughtfully designed hardware and software
- **Safety:** Electrically grounded system with interlocked door
- **Modularity:** Easily add hardware to accommodate experiments
- **Flexibility:** Generate random or aligned electrospun nanofibers
- **Robustness:** Made from solvent-resistant materials

Spinbox was designed by Bioinicia®, a world leader in electrospinning and electrospraying equipment, as an entry-level instrument suitable for basic research, proof-of-concept product development, or teaching purposes. This modular equipment offers a wide variety of accessories for applications like regenerative medicine, tissue engineering, drug delivery, energy storage, and filtration. Spinbox's safety features and assortment of material options including synthetic and natural polymers as well as additives like ceramics, metals, and active pharmaceutical ingredients make it effective for almost any application—from academic labs looking to upgrade from home-built systems, to industrial companies wanting to explore scalable new ideas. Built to fit in small lab spaces, its ergonomic design and ease of use provide a streamlined workflow. The wide range of capabilities and exceptional reliability supports efficient prototyping and process optimization.

Choose from three preconfigured Spinbox kits to best suit your application: Basic, Intermediate, and Advanced.

Basic Kit

Enter the world of professional electrospinning and electrospraying instruments with this easy-to-use kit.

Intermediate Kit

All the benefits of the Basic Kit, plus a rotating drum collector system for generating aligned fibers.

Advanced Kit

Generate complex samples like core-shell and tubular structures with higher-throughput, larger deposition area, and better homogeneity.

Continue To Kit Comparisons >

Features	Kit Configuration			Benefits
	Basic	Intermediate	Advanced	
Solvent Resistant Frame & Enclosure	X	X	X	Enables easy cleaning
LED Lighting	X	X	X	Illuminates inside of chamber for Taylor cone visualization
High-Voltage Power Supply (0 to +30 kV)	X	X	X	Controls voltage between emitter and collector
Variable Emitter Distance 5-25 cm	X	X	X	Changes distance between emitter and collector to affect solvent evaporation time
Exhaust System	X	X	X	Draws solvent vapors away to hood/exhaust system
Safety Door Interlock	X	X	X	Turns off power when enclosure is opened
Sealed Cable Pass Through	X	X	X	Allows plugging in other Spinbox or home-built accessories
Syringe Pump	X	X	X	Programmable, PC controlled flow of sample solvent
Flat Plate Collector	X	X	X	20 cm x 20 cm deposition area for sample
Single Phase Emitter	X	X	X	For solution delivery and biasing
T/RH Sensor	X	X	X	Track chamber temperature and relative humidity
Taylor Cone Camera	X	X	X	Visualize Taylor cone to ensure process stability
Laptop	X	X	X	Used to control flow rate, track T/RH and Taylor Cone video
Rotating Collector System (200 to 2,000 rpm)		X	X	Enables the use of different rotating collectors
Drum Collector		X	X	10 cm x 20 cm (D x L) for deposition of fibers (random or aligned) and particles
Second Syringe Pump (for coaxial)			X	Required for producing core shell structures; one pump for core, one pump for shell
Coaxial Single Phase Emitter			X	Enables development of core-shell structures
Multi-Emitter (up to 5 emitters, single phase and/or coaxial)			X	Enables higher throughput and faster deposition time
Mandrel Collector			X	Develop hollow cylindrical samples like artificial blood vessels
Scanning Emitter Motion			X	Increases deposition area and homogeneity
Collector High-Voltage Power Supply (-10 to 0 kV)			X	Improves sample deposition in the collector and prevents sample waste

Basic Kit

Highlights:

- Professional electrospinning & electrospraying platform with integrated HV from 0 to +30 kV
- Supports creation of fibers & particles (micro- and nano-scale)
- Taylor cone camera enables easy process optimization
- Track temperature and relative humidity
- Safety oriented (ventilation system, safety interlock)
- Made with easy to clean, high quality, solvent-resistant materials
- Upgrade at any point with plug-and-play accessories

Description

Spinbox Basic Kit is an ideal professional benchtop unit for beginners looking to perform proof-of-concept experiments with new materials and formulations via electrospinning and electrospraying. The Basic Spinbox kit is CE compliant, suitable for lab-scale materials, R&D, and teaching purposes, and includes a host of safety features. Intelligently designed as a true benchtop instrument, Spinbox is built from chemically resistant materials and its safety controls include electrical power interlocks that shut down the unit if the door is open, and a solvent exhaust system to protect users from harmful solvent vapors without requiring space under a fume hood. It can process synthetic and natural polymers, additives like ceramics, metals, and active pharmaceutical ingredients, or combinations of these materials.

The Basic Kit comes with a laptop and software to save and monitor images and video of the Taylor cone in real-time. Temperature and relative humidity are measured and displayed inside the chamber and can be recorded onto the laptop, facilitating process traceability. Sample solution is pumped using a software-controlled syringe pump from 0.1 µL/h to 6,000 mL/h depending on the syringe volume (up to 140 mL). The system includes an integrated high voltage power supply with tunable voltage from 0 to +30 kV, allowing a wide range of processable sample solutions. It can be field upgraded to the advanced kit with aftermarket plug-and-play accessories.

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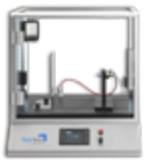
Basic Kit Components

Spinbox



» **Stainless Steel, Aluminum, & Glass Frame Enclosures**

The chamber is made of solvent resistant materials (i.e., anodized aluminum, high performance plastics, powder coated steel and glass), enabling proper solvent cleaning.

» **Special Safety-Encapsulated Diffuse LED Lighting**

Illuminates the chamber to enable proper visualization of the electrospinning or electrospraying process in real time.

» **One Integrated HV Power Supply**

Equipped with one high-voltage source (potentiometer-adjustable from 0 to +30 kV; resolution of 0.1 kV; 133 µA). Digital display on the Spinbox front panel to monitor the voltage over time.

» **Manual Regulation of Emitter-Collector Distance (5-25 cm)**

Allows sample processing in horizontal or vertical arrangement.

» **Solvent Exhaust System**

The equipment is provided with a ventilation fan to properly exhaust evaporated solvents. Fitted with a port to allow connection to an external ventilation via a 50 mm inside diameter duct.

» **Safety Door System**

Interlocked door system will shut down the instrument if the chamber door remains open.

» **Sealed Cable Pass-Through**

Tubing, power, and/or control wires can be routed into the chamber, enabling easy installation of additional accessories to improve the experimental setup.

» **CE Compliance**

Please contact us directly for UL certification-related inquiries.

» **Instrument Dimensions (W x D x H, mm)**

- External: 500 x 550 x 532
- Internal: 495 x 430 x 373

Syringe Feeding System

» **Single- Channel Syringe Pump**

Provides independent control of solution flow, enabling single-phase electrospinning. PC-controlled, provides accurate control of liquid infusion.

» **Syringe Volume: Up to 140 mL**

» **Min-Max Flow Rates:** 0.1 µL/h - 6,000 mL/h

Depending on syringe size: e.g., from 9.5 µL/h to 1,240 mL/h for a 5 mL BD plastic syringe

» **Linear Force: 100 - 200 N**

» **Programmable Volume & Time Allowing Highly Precise Operations**

» **Micro-controller Card**

The card is in a control module enabling the control of all process parameters

T/RH Precision Sensor

» **Temperature (T) & Relative Humidity (RH) Sensor Inside the Chamber**

Monitor both parameters during sample processing. All data can be logged and recorded through a WIFI connection onto a PC.

» **RH Range: 0 to 100% RH**

» **T Range: -20 to +60ºC**

Taylor Cone Camera

- **PC-Controlled Camera with Focusing Lens**
  Allows close monitoring of the Taylor Cone and spinning jet. This is especially recommended for use with coaxial electrospinning or electrospraying to assist with parameter optimization.
- **Images & videos can be acquired with provided so tware and laptop.**
- **Sensor:** SONY IMX179
- **Resolution:** 752 x 480, 3264(H) x 2448(V), 8 Megapixel

Single-Phase Spinning Head

- **Solution Fed Single-Phase Emitter**
  Enables single-phase (one solution) electrospinning or electrospraying.
- **Spinning Head with Easily Removable & Replaceable Capillary Needle**
  Can be used with disposable and non-disposable needles.

Flat Plate Collector

- **Stainless Steel Flat Plate Collector**
- **Deposition Area:** 200 mm x 200 mm
- **Horizontal & Vertical Sample Processing**
- **Easy Tool-Free Removal From Spinning Chamber**

Laptop Computer System

- **Laptop with a 15.6” Display**
  Used with the syringe feeding system, Taylor cone camera and thermohygrometer sensor. All other modules are controlled independently.
- **Minimum Specifications:**
  - **Microsoft Windows 10, 64-bit**
  - **2GHz + Intel Processor (i5 or i7)**
  - **500 GB SSD Hard Drive**
  - **1920 x 1080 Pixel Display**
  - **8 GB RAM**

Intermediate Kit

Highlights:

- Professional electrospinning & electrospraying platform with integrated HV from 0 to +30 kV
- Create random or aligned fibers OR micro-/nano-scale particles
- Made with easy-to-clean, high quality, solvent-resistant materials
- Taylor cone camera enables easy process optimization
- Track temperature and relative humidity
- Safety oriented (ventillation system, safety interlock)
- Controllable rotating drum for aligned fibers from 200 to 2,000 rpm
- Upgradable at any point with plug-and-play accessories

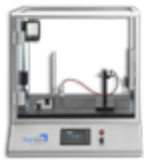
Description

Spinbox Intermediate Kit is an excellent choice for users looking to create aligned fibers with a professional benchtop unit. It can process synthetic and natural polymers, additives like ceramics, metals and active pharmaceutical ingredients or any combination of these. It offers all capabilities from the Spinbox Basic Kit. The rotating drum (10 cm x 20 cm; D x L) spins from 200 to 2,000 rpm. The rotating platform can be configured with an optional mandrel collector (for tubes) or disk collector (for aligned fiber bundles) that are sold separately. The Intermediate Spinbox Kit is CE compliant, suitable for lab-scale materials, R&D, and teaching purposes, and includes the same host of safety features as the Basic Kit. Intelligently designed as a true benchtop instrument, Spinbox is built from chemically resistant materials and its safety controls include electrical power interlocks that shut down the unit if the door is open, and a solvent exhaust system to protect users from harmful solvent vapors without requiring space under a fume hood.

The Intermediate Kit comes with a laptop and software to save and monitor images and video of the Taylor cone in real-time. Temperature and relative humidity are measured and displayed inside the chamber and can be recorded onto the laptop, facilitating process traceability. The sample solution is pumped using a software-controlled syringe pump from 0.1 µL/h to 6,000 mL/h depending on the syringe volume (up to 140 mL). The system includes an integrated high voltage power supply with tunable voltage from 0 to +30 kV, allowing a wide range of processable sample solutions. It can be field upgraded to the advanced kit with aftermarket plug-and-play accessories.

Intermediate Kit Components

Spinbox



- **Stainless Steel, Aluminum, & Glass Frame Enclosures**

  The chamber is made of solvent resistant materials (i.e., anodized aluminum, high performance plastics, powder coated steel and glass), enabling proper solvent cleaning.

- **Special Safety-Encapsulated Diffuse LED Lighting**

  Illuminates the chamber to enable proper visualization of the electrospinning or electrospraying process in real time.

- **One Integrated HV Power Supply**

  Equipped with one high-voltage source (potentiometer-adjustable from 0 to +30 kV; resolution of 0.1 kV; 133 µA). Digital display on the Spinbox front panel to monitor the voltage over time.

- **Manual Regulation of Emitter-Collector Distance (5-25 cm)**

  Allows sample processing in horizontal or vertical arrangement.

- **Solvent Exhaust System**

  The equipment is provided with a ventilation fan to properly exhaust evaporated solvents. Fitted with a port to allow connection to an external ventilation via a 50 mm inside diameter duct.

- **Safety Door System**

  Interlocked door system will shut down the instrument if the chamber door remains open.

- **Sealed Cable Pass-Through**

  Tubing, power, and/or control wires can be routed into the chamber, enabling easy installation of additional accessories to improve the experimental setup.

- **CE Compliance**

  Please contact us directly for UL certification-related inquiries.

- **Instrument Dimensions (W x D x H, mm)**
  - External: 500 x 550 x 532
  - Internal: 495 x 430 x 373

Syringe Feeding System

- **Single- Channel Syringe Pump**

  Provides independent control of solution flow, enabling single-phase electrospinning. PC-controlled, provides accurate control of liquid infusion.

- **Syringe Volume: Up to 140 mL**

- **Min-Max Flow Rates:** 0.1 µL/h - 6,000 mL/h

  Depending on syringe size: e.g., from 9.5 µL/h to 1,240 mL/h for a 5 mL BD plastic syringe

- **Linear Force: 100 - 200 N**

- **Programmable Volume & Time Allowing Highly Precise Operations**

- **Micro-controller Card**

  The card is in a control module enabling the control of all process parameters

T/RH Precision Sensor

- **Temperature (T) & Relative Humidity (RH) Sensor Inside the Chamber**

  Monitor both parameters during sample processing. All data can be logged and recorded through a WIFI connection onto a PC.

- **RH Range: 0 to 100% RH**

- **T Range: -20 to +60ºC**

Taylor Cone Camera

- **PC-Controlled Camera with Focusing Lens**

  Allows close monitoring of the Taylor Cone and spinning jet. This is especially recommended for use with coaxial electrospinning or electrospraying to assist with parameter optimization.

- **Sensor:** SONY IMX179

- **Images & videos can be acquired with provided softwsoftware and laptop.**

- **Resolution:** 752 x 480, 3264(H) x 2448(V) 8 Megapixel

Single-Phase Spinning Head

» **Solution Fed Single-Phase Emitter**

Enables single-phase (one solution) electrospinning or electrospraying.

» **Spinning Head with Easily Removable & Replaceable Capillary Needle**

Can be used with disposable and non-disposable needles.

Flat Plate Collector

» **Stainless Steel Flat Plate Collector**

» **Deposition Area:** 200 mm x 200 mm

» **Horizontal & Vertical Sample Processing**

» **Easy Tool-Free Removal From Spinning Chamber**

Laptop Computer System

» **Laptop with a 15.6" Display**

Used with the syringe feeding system, Taylor cone camera and thermohygrometer sensor. All other modules are controlled independently.

» **Minimum Specifications:**

- **Microsoft Windows 10, 64-bit**
- **2GHz + Intel Processor (i5 or i7)**
- **500 GB SSD Hard Drive**
- **1920 x 1080 Pixel Display**
- **8 GB RAM**

Rotating Collecting System

» **Collector Rotation Speed:** 200 - 2,000 rpm

Up to 10 m/s linear speed with 10 cm diameter drum, enabling collection of randomly oriented or circumferentially aligned fibers.

» **Easy mounting:**

Interchangeable rotating drum & collector

Drum Collector

» **Cylindrical Anodized Aluminum Collector**

Used for mounting into the universal rotating collector platform

» **Standard Drum Size:**

10 cm diameter x 20 cm length.

Advanced Kit

Highlights:

- Professional electrospinning and electrospraying platform with up to 40 kV voltage drop
- Emitter (needle) power supply (0 to +30 kV) and collector power supply (-10 to 0 kV) to improve deposition control onto the collector
- Made with easy-to-clean, high quality, solvent-resistant materials
- Create random or aligned fibers OR micro-/nano-scale particles
- Taylor cone camera enables easy process optimization
- Track temperature and relative humidity
- Safety oriented (ventillation system, safety interlock)
- Controllable rotating drum (aligned fibers) and mandrel (hollowmw rods ex. artificial blood vessels) from 200 to 2,000 rpm
- Needle motion on Y-axis allows better sample homogeneity
- Includes second syringe pump and coaxial emitter to generate core-shell structures
- Multi-needle system allows high-throughput of single or core-shell structures

Description

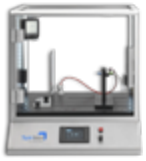
Spinbox Advanced Kit is the best choice for users looking for electrospinning and electrospraying versatility in a professional benchtop unit. It can process synthetic and natural polymers, additives like ceramics, metals and active pharmaceutical ingredients or any combination of these. It offers all capabilities from Spinbox Basic and Spinbox Intermediate Kits. It comes with scanning emitter (needle) motion for increased sample homogeneity over a larger area compared to static needle processing. The needle can be biased from 0 to +30 kV with an integrated high voltage power supply with tunable voltage, and the collector can be biased from -10 to 0 kV to improve sample deposition onto the collector for a total voltage drop up to 40 kV. The rotating drum (10 cm x 20 cm; D x L) and mandrel (5 mm x 20 cm; D x L) spin from 200 to 2,000 rpm. The drum can collect random or aligned fibers and the mandrel can be used to create tubular hollow samples such as artificial blood vessels.

The Advanced Spinbox Kit is CE compliant, suitable for lab-scale materials, R&D, and teaching purposes, and includes the same host of safety features as the Basic and Intermediate Kits. Intelligently designed as a true benchtop instrument, Spinbox is built from chemically resistant materials and its safety controls include electrical power interlocks that shut down the unit if the door is open, and a solvent exhaust system to protect users from harmful solvent vapors without requiring space under a fume hood.

The Advanced Kit comes with a laptop and software to save and monitor images and video of the Taylor cone in real-time. Temperature and relative humidity are measured and displayed inside the chamber and can be recorded onto the laptop, facilitating process traceability. Sample solution is pumped using a software-controlled syringe pump from 0.1 µL/h to 6,000 mL/h depending on the syringe volume (up to 140 mL). It comes with a second syringe pump and a coaxial emitter to generate core-shell fibers or particles; an ideal feature when the user is looking to encapsulate an active ingredient or to impart multiple properties onto the same sample. The Advanced Kit comes with a multi-needle system allowing you to process a solution with five simultaneous needles to improve throughput and decrease sample processing time.

Advanced Kit Components

Spinbox



- **Stainless Steel, Aluminum, & Glass Frame Enclosures**

  The chamber is made of solvent resistant materials (i.e., anodized aluminum, high performance plastics, powder coated steel and glass), enabling proper solvent cleaning.

- **Special Safety-Encapsulated Diffuse LED Lighting**

  Illuminates the chamber to enable proper visualization of the electrospinning or electrospraying process in real time.

- **One Integrated HV Power Supply**

  Equipped with one high-voltage source (potentiometer-adjustable from 0 to +30 kV; resolution of 0.1 kV; 133 µA). Digital display on the Spinbox front panel to monitor the voltage over time.

- **Manual Regulation of Emitter-Collector Distance (5-25 cm)**

  Allows sample processing in horizontal or vertical arrangement.

- **Solvent Exhaust System**

  The equipment is provided with a ventilation fan to properly exhaust evaporated solvents. Fitted with a port to allow connection to an external ventilation via a 50 mm inside diameter duct.

- **Safety Door System**

  Interlocked door system will shut down the instrument if the chamber door remains open.

- **Sealed Cable Pass-Through**

  Tubing, power, and/or control wires can be routed into the chamber, enabling easy installation of additional accessories to improve the experimental setup.

- **CE Compliance**

  Please contact us directly for UL certification-related inquiries.

- **Instrument Dimensions (W x D x H, mm)**
  - External: 500 x 550 x 532
  - Internal: 495 x 430 x 373

Syringe Feeding System

- **Single- Channel Syringe Pump**

  Provides independent control of solution flow, enabling single-phase electrospinning. PC-controlled, provides accurate control of liquid infusion.

- **Syringe Volume: Up to 140 mL**
- **Min-Max Flow Rates:** 0.1 µL/h - 6,000 mL/h

  Depending on syringe size: e.g., from 9.5 µL/h to 1,240 mL/h for a 5 mL BD plastic syringe

- **Linear Force: 100 - 200 N**
- **Programmable Volume & Time Allowing Highly Precise Operations**
- **Micro-controller Card**

  The card is in a control module enabling the control of all process parameters

T/RH Precision Sensor

- **Temperature (T) & Relative Humidity (RH) Sensor Inside the Chamber**

  Monitor both parameters during sample processing. All data can be logged and recorded through a WIFI connection onto a PC.

- **RH Range: 0 to 100% RH**
- **T Range: -20 to +60ºC**

Taylor Cone Camera

- **PC-Controlled Camera with Focusing Lens**

  Allows close monitoring of the Taylor Cone and spinning jet. This is especially recommended for use with coaxial electrospinning or electrospraying to assist with parameter optimization.

- **Images & videos can be acquired with provided software and laptop.**
- **Resolution:** 752 x 480, 3264(H) x 2448(V), 8 Megapixel
- **Sensor:** SONY IMX179

Single-Phase Spinning Head

- **Solution Fed Single-Phase Emitter**

  Enables single-phase (one solution) electrospinning or electrospraying.

- **Spinning Head with Easily Removable & Replaceable Capillary Needle**

  Can be used with disposable and non-disposable needles.

Flat Plate Collector

- **Stainless Steel Flat Plate Collector**
- **Deposition Area:** 200 mm x 200 mm
- **Horizontal & Vertical Sample Processing**
- **Easy Tool-Free Removal From Spinning Chamber**

Laptop Computer System

» **Laptop with a 15.6” Display**

Used with the syringe feeding system, Taylor cone camera and thermohygrometer sensor. All other modules are controlled independently.

» **Minimum Specifications:**

- **Microsoft Windows 10, 64-bit**
- **2GHz + Intel Processor (i5 or i7)**
- **500 GB SSD Hard Drive**
- **1920 x 1080 Pixel Display**
- **8 GB RAM**

Rotating Collecting System

» **Collector Rotation Speed:** 200 - 2,000 rpm

Up to 10 m/s linear speed with 10 cm diameter drum, enabling collection of randomly oriented or circumferentially aligned fibers.

» **Easy mounting:**

Interchangeable rotating drum & collector

Drum Collector

» **Cylindrical Anodized Aluminum Collector**

Used for mounting into the universal rotating collector platform

» **Standard Drum Size:**

10 cm diameter x 20 cm length.

Negative High-Voltage Source

» **Secondary Negative High-Voltage Source**

potentiometer-adjustable: -10 to 0 kV; resolution of 0.1 kV; 133 µA

» **Module Includes Digital Display for Voltage Monitoring**

» **Improve deposition control & increase overall voltage drop**

Ideal to improve deposition control onto collector and increase overall voltage drop up to 40 kV.

Scanning Emitter Motion Feature

» **Y-Axis linear automated motion**

Y-Axis linear automated motion of the spinning head to create wider, homogeneous samples.

» **Fabrication of Homogenous Nano/Micro-Fibrous Sheets or Coatings**

In combination with the rotating drum collector, this enables the fabrication of homogenous nano/micro-fibrous sheets or coatings up to 100 mm x 310 mm.

» **Stroke Length & Speed**

Set during manufacture to default stroke length: 100 mm with sweep speed of 100 mm/screate wider, homogeneous samples.

Coaxial Spinning Head

» **Spinning Head**

Enables both single-phase and coaxial electrospinning or electrospraying.

Coaxial Parallel Multi-Emitter Spinning Head

» **Multi-emitter spinning head (5 Emitters)**

Enables both single-phase and coaxial electrospinning or electrospraying.

» **For use with stainless Steel Special Fittings**
(Accommodates Needles from 0.15 - 1.7 mm OD)

- **Inner Needle:**
  Supplied by default: 0.9 mm OD x 0.6 mm ID (x3)
- **Outer Needle:**
  Supplied by default: 1.7 mm OD x 1.4 mm ID (x3)
- Supplied with fittings and PTFE tubing ready made to connect with solution-loaded syringes.

Mandrel Collector

» **Stainless Steel Rod Collector**

Used for mounting into the universal rotating collector platform.

» **Allows Fabrication of Nanofiber-Walled Tubular Structures**

» **Standard Dimensions:** 5mm Diameter x 20cm length