

## E-Fiber

Modular electrospinning/electrospraying platform

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### **EF100 - Electrospinning/electrospraying system**

EF100 is an electrospinning/electrospraying complete plug & play solution for research and development applications and for users who require a modular upgradeable setup.

EF100 is a fully-customisable electrospinning/electrospraying platform consisting of injection stages and application-specific collectors (static or movable), for laboratory-scale manufacturing of polymeric nanofibrous matrices.

This device provides a powerful and highly versatile technique for the creation of various fibrous architectures with controlled fiber diameter and orientation. Its technology minimizes influence on the electrospinning process.

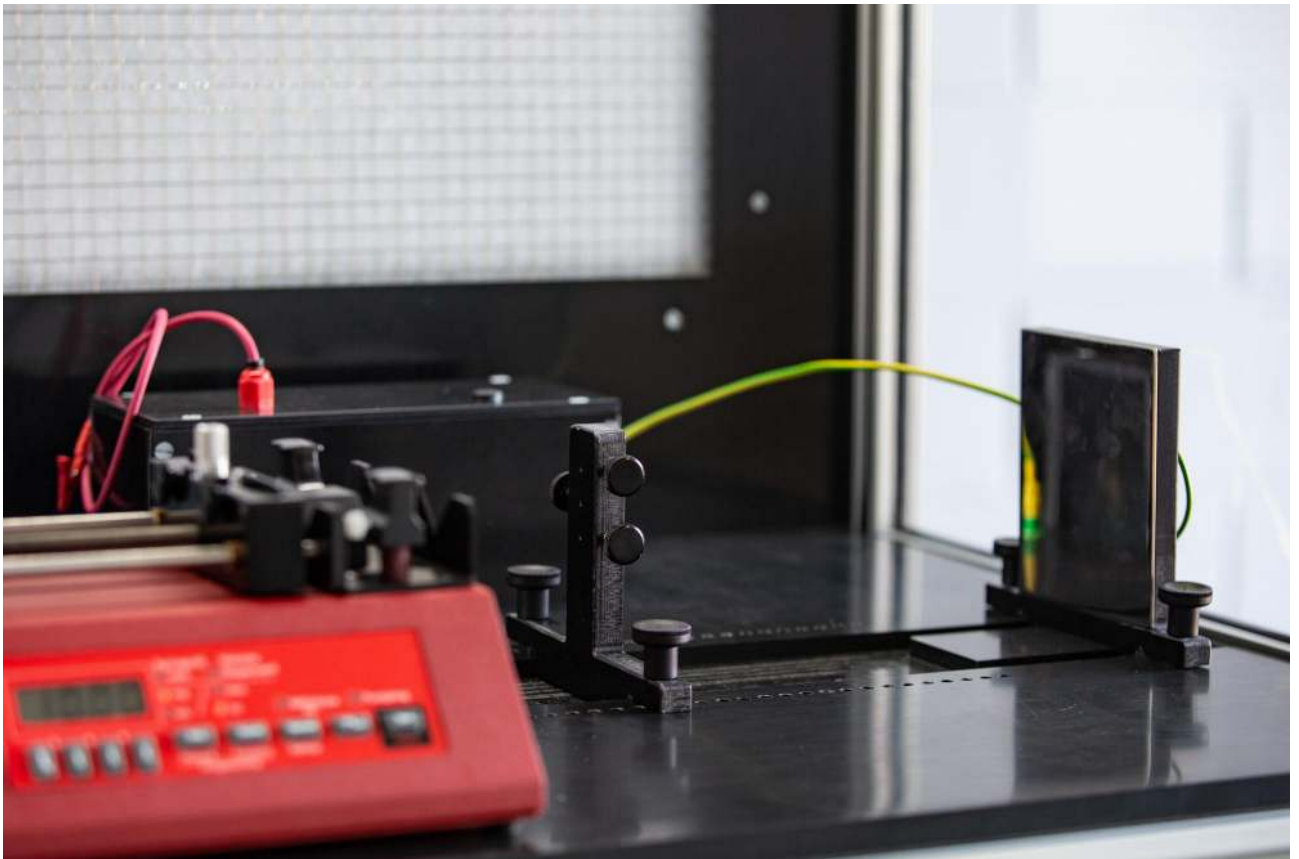
E-Fiber EF100 offers various technological solutions to accurately control each process guaranteeing batch-to-batch reproducibility and precise control of fiber parameters such as diameter, orientation and texture.

The equipment is user-friendly and safe thanks to the automatic safety devices that protects the operator during operations.

E-Fiber EF100 is a Desktop system that in its basic setup includes:

- cabinet with extraction fan
- high voltage power supply 0-40 kV
- control system with LCD console
- 1-channel syringe pump with external remote control
- manual distance adjusting
- spinneret and collector insulating support
- disposable kit

Disposable kit includes 2 stainless steel spinnerets of 2 different diameters, 100 syringes, tygon/ptfe tubing (7.5m), polypropylene male and female luer connectors (15+15).



Standard system is installed in a cabinet equipped with an extraction fan.

EF100 can be equipped with a TUV certified fume-hood with an active carbon filtered system (customizable for specific solvents and chemical agents).

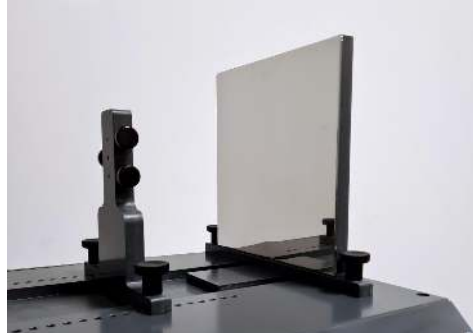


### **EF100 - Accessories and upgrade**

E-Fiber can be equipped and upgraded with a variety of accessories to extend and best fit user requirements and applications.

#### **EFA125 - Bigger plate collector**

Replaces the standard-size supplied flat collector with a bigger one of size 200mmx200mm, useful for bigger spinning area collection and for use with multiple needles.



#### **EFA150 - Fume Hood Filtering Unit**

E-Fiber EF100 can be completely integrated in our certified fume-hoods with activated carbon filters, thus allowing you to immediately start electrospinning/spraying in any situation, without risks related to the solvent vapor used. With this accessory EF100 becomes a standalone Desktop system with no need to connect to any extraction fume system. The activated carbon filters can be customized for specific solvents and chemical agents, according to customer's needs.



**EFA160 - Touch Control Panel**

All SKE Research Equipment E-Fiber systems can be equipped with a touch screen control panel. All the parameters of the system can be controlled directly from the touch panel, in a simple and intuitive way.



**EFA010 - Interchangeable size rotating collector**

Rotating collector used to electrospin cylindrical or big planar structures with oriented and non-oriented fibers (depending on rotation speed). This version can house cylindrical collectors (mandrels) with different diameters and lengths and, because it is highly flexible and versatile, it is ideal for research applications.

Entirely made with insulating materials, in order to avoid interferences with the electrical field and electrospinning process. Electronic feedback for a precise control over speed rotation, in order to grant highly reproducible batch-to-batch conditions. Supplied with 5 collectors of different diameters.

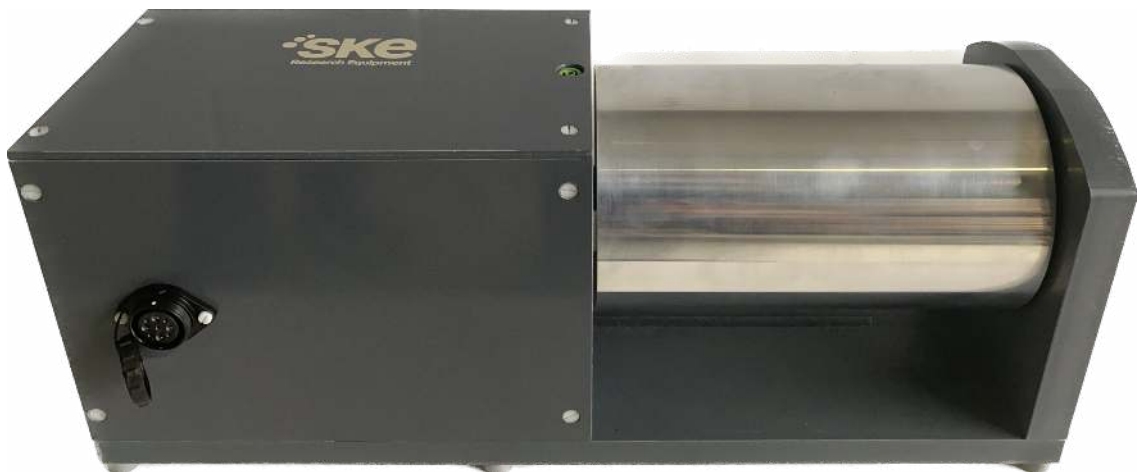
Standard parameters : adjustable speed between 50-1200 rpm, collectors up to 250mm length and 150mm diameter.



**EFA015 - High speed rotating collector**

A motor-driven cylindrical collector, used for electrospinning cylindrical or big planar structures with oriented and non-oriented fibers: this model can reach very high rotation speed. Entirely made with insulating materials, in order to avoid interferences with the electrical field and electrospinning process. Electronic feedback for a precise control over speed rotation, in order to grant highly reproducible batch-to-batch conditions.

Standard Parameters : adjustable speed between 50-3000 rpm, collector 250mm length and 150mm diameter.



**EFA190 - EFA195 - Multi Channel Syringe pump**

Replaces the standard supplied syringe pump, useful for electrospinning of high quantity of solution through multiple syringes, big target collectors, or coaxial and triaxial spinneret.

Available with 2 and 6 channels





### EFA050 - Multispinneret support

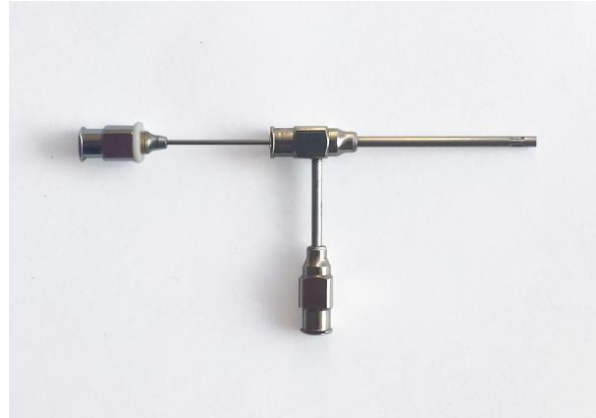
Multispinneret nozzle support for multinozzle system. This accessories allows to cover with nanofibers or nanoparticles a wider target area and produce larger samples.



### EFA035 - Coaxial spinneret nozzle

Coaxial spinneret needle made of two coaxial needles, used to simultaneously electrospin up to two different polymers. This is generally used to create fibers whose core and shell are made of different materials. Ideal for research purposes. Detachable options for easy cleaning operations. Minimum dead volume.

Fully customizable and made according to customer specifications (need at least a dual channel syringe pump or 2 single channel syringe pumps).



### EFA040 - Triaxial spinneret nozzle

Triaxial spinneret needle, made of three coaxial needles, used to simultaneously electrospin up to three different polymers. Generally used to create fibers with cores and shells made of different materials. Ideal for research purposes. Detachable options for easy cleaning operations. Minimum dead volume.

Fully customizable and made according to customer specifications. (need at least a six channel syringe pump).



### **EFA045 - Quadriaxial spinneret nozzle**

Quadriaxial spinneret needle, made of four coaxial needles, used to simultaneously electrospin up to four different polymers. Generally used to create fibers with cores and shells made of different materials. Ideal for research purposes. Detachable options for easy cleaning operations. Minimum dead volume.

Fully customizable and made according to customer specifications. (need at least a six channel syringe pump).



### **EFA145 - Climate control unit - Humidity reduction**

E-Fiber EF100 system can be equipped with an external humidity reduction module, in order to control environmental parameters on your working area, with a real time monitoring. This module dehumidifies the air of the working area, and keeps it constant during your electrospinning session. Humidity is directly visualized on the control user interface. It is equipped with its own control panel, and eventually can be integrated in your E-Fiber also at a later time.

Parameters : humidity reduction up to 20% RH, working range: 0 – 100% RH, Dehumidification performance 1.6 kg/h @ 60% RH.





### **EFA140 - Climate control unit - Heater**

E-Fiber EF100 system can be equipped with an external heater module, in order to control environmental parameters on your working area, with a real time monitoring. This module can heat the air of the working area, and keeps it constant during your electrospinning session. Temperature is directly visualized on the control user interface. It is equipped with its own control panel, and eventually can be integrated in your E-Fiber also at a later time.

Parameters : heating of electrospinning area up to 40 °C.



### **EFA130 - Climate control unit - Full environmental control**

E-Fiber EF100 system can be equipped with an external full control module, in order to control environmental parameters on your working area, with a real time monitoring. This module controls temperature and humidity of the air of the working area, and keeps it constant during your electrospinning session. You can directly manage your setpoint of °C and RH% on the control user interface.

Parameters :

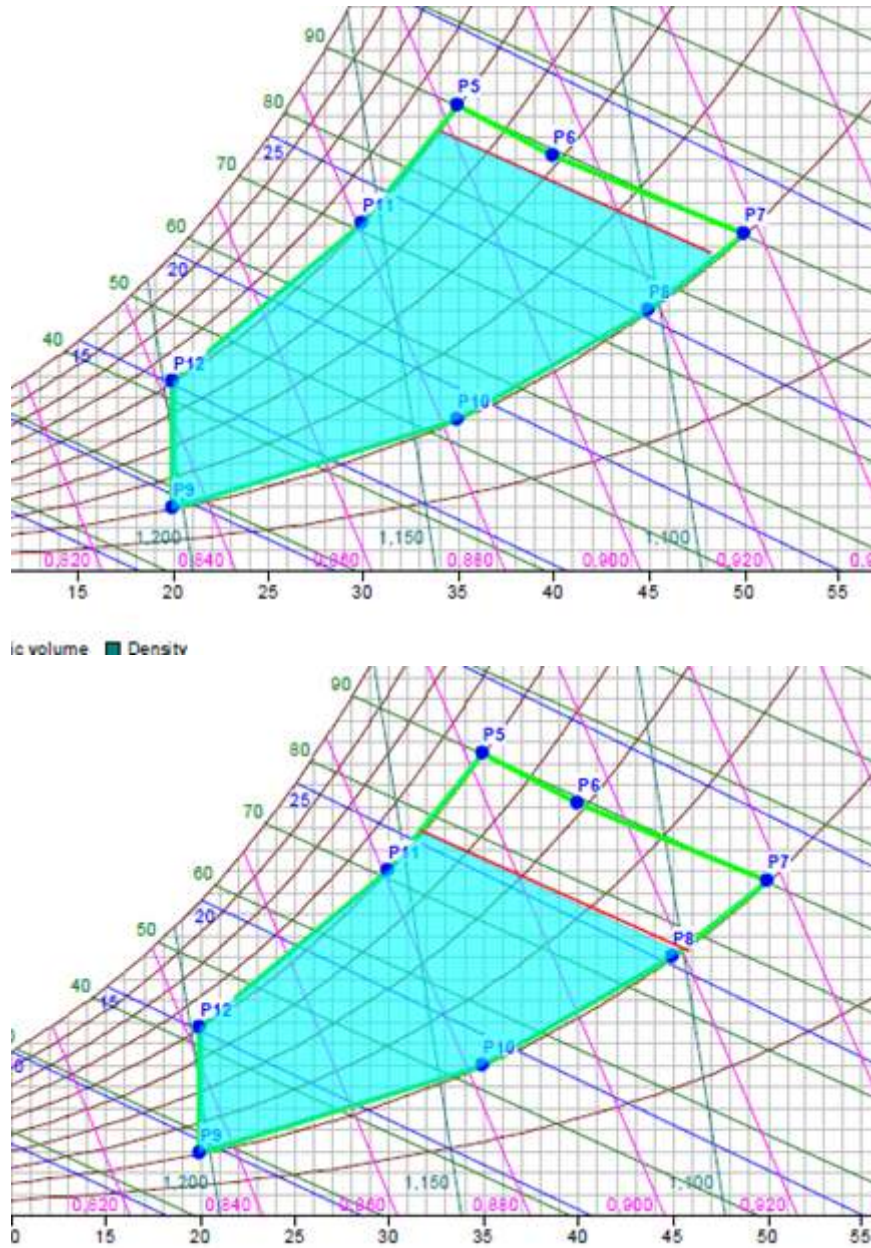
Setting Range: Tenv/+35°C – 20/60 % RH,

Working range: +18/+25°C – 40/80% RH,

Heating power: 3 kW, Dehumidification power: 2kW,

Air volume effective: 150 m3/h





### EFA350 - Disposable kit

The disposable kit includes:

- 2 stainless steel nozzles of different diameters
- 100 syringes
- tygon/ptfe tubing (7.5m)
- polypropylene male and female luer connectors (15+15).



## TECHNICAL DATA

### General Information

Dimensions	800 mm x 700 mm x 1300 mm (W x D x H)
Weight	approx. 50 kg (standard equipment)
Cable Length	AC power supply 1.5 meters
User interface	LCD with voltage and current monitor (default) Pump button on/off High voltage on/off Touch screen (on request, default with Climate Control Unit)
Emergency Button	Yes
Safety switch (interlock)	Yes
Main power	110-220 Vac ~ 50/60Hz

### High-voltage power supply (CE and UL mark)

Voltage *	Single High Voltage power supply 0÷30kV (higher voltage on request)
Polarity *	Positive (default)

	Negative can be customized on request (dual polarity on request)
Power *	30W for high voltage power supply (higher power on request)
Current *	0,5 mA max
Arc and Short-circuit protection	Yes
Safety Interlock	Yes
Voltage Accuracy	± 2%
Voltage Stability	0,01% per 8h
Regulatory Approvals	Compliant to 2004/108/EC EMC Directive Compliant to 2006/95/EC Low Voltage Directive

\* Fully customizable features

### Syringe pump

Channels	1
Syringe	up to 60 mL
Infusion rates	from 0.73µL/hr (1mL syringe) to 1500mL/hr (60mL syringe)
Dispensing accuracy	+/- 1.00 %

### Collector

Shape *	square
Size *	120 [W] x 130 [D] mm (default) 200[W] x 200 [D] mm (on request)
Material *	stainless steel
Spinning Distance	50 ÷ 300 mm

### Spinneret

Spinneret type	Single spinneret
Spinneret range size*	30G up to 10G
Length*	50 mm
Material	stainless steel

\* Fully customizable features

### Safety

Interlock system	On door opening, Safe/Normal mode
Emergency button switch	Mushroom red button
Fume extraction	Enclosure with extraction fan

	Maximum extracted volume 108 m <sup>3</sup> /h
External fume extraction connection	80 mm
Filtering option	TUV certified fume-hood with active carbon filter (optional) Maximum filtered volume 300 m <sup>3</sup> /h
In Force legislations	LVD 2014/35/UE 2006/42/CE

## **ORDERING DETAILS**

Product code	EF100
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