



# **Electrostatic Discharge Simulator for Melt-blown (ESD-RPB)**

## **User's Manual**

**Global Office of Lisun Electronics Inc.**

<http://www.Lisungroup.com>

Lisun Group (Hong Kong) Limited

Add: Room 803, Chevalier House, 45-51 Chatham Road South, Tsim Sha Tsui, KL, HK

Tel: 00852-68852050    Fax: 00852-30785638

Email: SalesHK@Lisungroup.com

Lisun Electronics (Shanghai) Co., Ltd

Add: 113-114, No. 1 Building, Nanxiang Zhidi Industry Park, No. 1101, Huyi Road, Jiading District, Shanghai, 201802, China

Tel: +86(21)5108 3341    Fax: +86(21)5108 3342

Email: SalesSH@Lisungroup.com

Lisun Electronics Inc. (USA)

Add: 445 S. Figueroa Street, Los Angeles, CA 90071, U.S.A.

Email: Sales@Lisungroup.com

Lisun China Factory

Add: NO. 37, Xiangyuan Road, Hangzhou City, Zhejiang Province, China

Tel: +86-189-1799-6096

Email: Engineering@Lisungroup.com

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ESD-RPB Electrostatic Discharge Simulator for Melt-blown is composed of a pin-type electrostatic rod and a high-voltage DC power supply. The high-voltage DC power supply provides high voltage for ion emission, and the pin-type electrostatic bar emit negative (positive) ions, then charges objects such as melt-blown. It is widely used in non-woven fabrics, printing, film sticking, paint spraying, flocking, sorting, biological engineering and other fields.

## 1. Principle

Because the filtration efficiency of ordinary melt-blown non-woven fabrics is less than 70%, it is not enough to mechanically block the three-dimensional aggregate of fibers that are purely based on melt-blown ultrafine fibers with fine fibers, small voids, and high porosity. Therefore, melt-blown filter materials generally need add electrostatic charge effect to the melt-blown cloth through electrostatic electret process, improve the filtration efficiency through the electrostatic methods, so that the filtration efficiency can reach to 99.9%, a thin layer can achieve the expected standard, and the respiratory resistance is still small.

The current electrostatic electret methods mainly include electrostatic spinning method, pin-type discharge method, triboelectric method, thermal polarization method, low energy electron beam bombardment method, etc. Among them, the pin-type discharge method is the best electrostatic electret method at present. In the pin-type discharge method, the melt-blown fiber web is charged by the corona discharge method of the electrostatic generator pin-type electrode (voltage is generally 5-60KV) before winding. When the high voltage is applied, the air below the pin tip generates corona ionization. The carrier ions are deposited on the surface of the melt-blown by the electric field. A part of the carrier ions will penetrate into the surface layer and be captured by the trap of the electret masterbatch, thus making the melt-blown an electret filter material.

Increasing the charge on the surface of the melt-blown fabric can be obtained through the electret treatment process of the corona discharge method. But for this electrostatic storage to not decay, the composition and structure of the melt-blown electret material are needed to facilitate charge retention. And by introducing additives with charge storage properties to generate charge traps to capture charge, can improve the charge storage capacity of electret materials. Therefore, compared with ordinary melt-blown production lines, the production of melt-blown production lines for air filtration materials needs to add electret masterbatch such as tourmaline particles to the production material polypropylene (PP), and increase its PFE or BFE filterability by means of electrostatic electrets.

## 2. Specifications:

### (1) High voltage DC power supply (With high frequency design)

Model	ESD-RPB30KV	ESD-RPB60KV
Input voltage	220V/50Hz (120V/60Hz customizable)	
Output voltage/current	30KV/5mA	60KV/2.5mA
Output polarity	Positive (+): ESD-RPB30KV Negative (-): ESD-RPB30KVM	Positive (+): ESD-RPB60KV Negative (-): ESD-RPB60KVM
Output port	1 (Can be customized multiple)	
Dimension	30*17*36cm (L*H*D)	
Weight	12kg	

**(2) Pin Type Corona Electrostatic Bar:** The internal circuit is designed with functions such as preventing arc sparking and steady current, which fully guarantee the stability and uniformity of the current output of each needle.

Model	ESD-BAR800	ESD-BAR1200	ESD-BAR1600	ESD-BAR2000
Effective length	800mm	1200mm	1600mm	2000mm
Actual length	900mm	1300mm	1700mm	2100mm
Static needle	Tungsten needles, needle spacing and needle diameter are designed by LISUN			

**Note:** Longer electrostatic bars can be customized according to the actual melt-blown fabric width; the effective length in the above table can be customized to extend 5-20mm according to requirements, and the actual length can be customized to extend 50-150mm according to requirements.

**(3) The Rack for Melt-blown Corona Electrostatic:** Stainless steel shell, fully alumina roller designed by LISUN, used with high voltage DC power supply and pin-type electrostatic bar. Can support up to four Electrostatic Electret Generators to work at the same time to ensure long-term static electricity.



Model	ESD-RACK800	ESD-RACK1200	ESD-RACK1600	ESD-RACK2000
Effective width	1000mm	1400mm	1800mm	2200mm

**Note:** The longer Rack for Melt-blown Corona Electrostatic can be customized according to the actual melt-blown width; the effective width in the above table can be customized to extend 50-150mm according to the requirements.

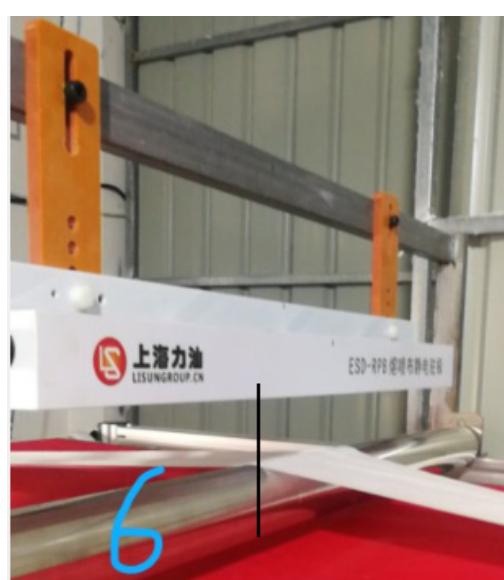
### 3. Installation:

LISUN Electrostatic auxiliary installation method



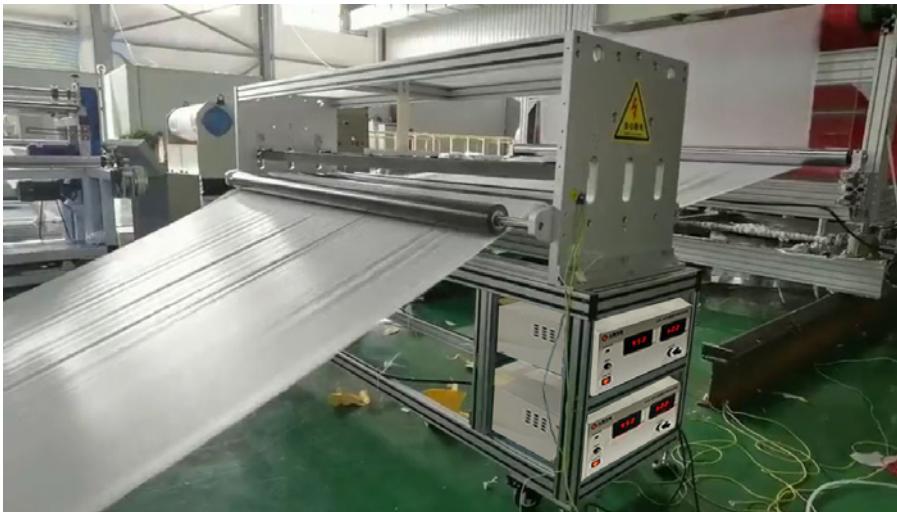
#### Note:

- A. Item 7 and 8 should grounded separately
- B. The distance between the U-shaped wooden frame supporting the electrostatic rod and the cloth is recommended to be about 4~5mm, and you can see slight blue light at night.
- C. The item 6 must be metal and close to the melt-blown (the metal rod shown by the blue number 6 in the figure below), and the contact point of the metal rod and the melt-blown should be in the same line with the Electrostatic Bar's needle pin (as the below black line showed)



D. If budget is sufficient, you can equipment with LISUN Rack for Melt-blown Corona Electrostatic, the special all-oxy aluminum guide roller can greatly improve the electrostatic electret effect (As shown in the below figure)

E. If budget is sufficient, you can do same electric double electret (the other one can be at the position 4), or you can do the different electric double electret (for specific plans, please contact LISUN). According to experiments, the double electret is equivalent to increasing the electret time and has a significant effect on PFE value.



**F. Before turning off the Electrostatic electret equipment, please adjust the voltage to 0, and then turn off the power.**

#### 4. Maintenance

- (1) This equipment don't have parts that users can repair theirselves;
- (2) If users replace with non-original parts by themselves, there is no warranty then;
- (3) For maintenance, please contact LISUN;

**Note:** Please keep dry and free of dust, dirt and chemicals. Problems caused by long-term dust accumulation are not covered by the warranty.

#### 5. Faults

The faults checking work needs to be done by a professional engineer. Please cut off the power before checking the fault.

Fault	Caused reason	Solution
Device not working	Power supply voltage is too low or no input	Restore power supply voltage
	Voltage cannot be increased	Replace the fuse on the main panel (the package have some backup fuse). If the voltage cannot be raised after replacement, send it back to LISUN for repair
	The screen is not bright	Replace the fuse under the power socket on the back of the host, please check the fuse spec with LISUN