



# Chargemaster Pinner Superbar

**ARC RESISTANT CHARGING APPLICATOR**

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**INSTALLATION AND OPERATING INSTRUCTIONS**

# TABLE OF CONTENTS

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<b>1. SAFETY WARNINGS</b> .....	<b>1</b>
<b>2. DESCRIPTION</b> .....	<b>2</b>
Receipt of Equipment .....	2
Return Shipments .....	2
<b>3. SPECIFICATIONS</b> .....	<b>3</b>
<b>4. INSTALLATION</b> .....	<b>4</b>
Determine Superbar Location .....	4
Install High Voltage Cables .....	7
Install Optional Mounting Bracket (5051494).....	8
<b>5. OPERATION</b> .....	<b>9</b>
<b>6. TROUBLESHOOTING</b> .....	<b>10</b>
<b>7. MAINTENANCE</b> .....	<b>11</b>
Cleaning Charging Bars .....	11
Replacing Ionizing Pins.....	12
Replacing HV Connectors .....	12
<b>8. WARRANTY</b> .....	<b>13</b>

## 1. SAFETY WARNINGS

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**NOTE** – Statements identified with a NOTE indicate precautions necessary to avoid potential equipment failure.



**CAUTION** – Statements identified with a CAUTION indicate potential safety hazards.



**NOTE** – This equipment must be correctly installed and maintained. Adhere to the following notes for safe installation and operation:

1. Read instruction manual before installing or operating equipment.
2. Only qualified service personnel are to perform installation and repairs.
3. All equipment must be properly grounded, including the machine frame to which the equipment is mounted and all metal parts in the vicinity.
4. Please inspect this product for any signs of mechanical damage prior to use. If the product is damaged it should not be put in service and use should be discontinued.



**CAUTION – Electrical Shock Hazard**

Always disconnect power supply before connecting or disconnecting charging equipment. Never touch a charging bar when power supply is energized.



**CAUTION – Fire Hazard**

Do not install or operate equipment in close proximity to any flammable solvents or flammable materials.



**NOTE** – Do not install bars face-to-face closer than 3” apart. Failure to comply with this requirement voids the warranty for this product.

## 2. DESCRIPTION

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Simco-Ion's Pinner Superbar Charging Applicators are part of the Chargemaster Electrostatic Generating System. The Superbars are energized with Simco-Ion Chargemaster VCM or BP series DC power supplies that provide the necessary high voltage that is current limited for safety. This system is used to produce electrostatic adhesion for temporarily bonding or pinning materials. The success of the process depends on the insulating qualities of the material being charged, the distance to ground, distance between bars, cleanliness, ion pin sharpness and the applied voltage. Good insulators, such as plastic films, work particularly well with this process.

Eight rows of ionizing pins enable the Superbar to produce more ionization and afford higher pinning action than conventional charging bars. The locations of the ionizing pins on the charging bar are divided into two sections. Each row consists of four sets of pins. Pin alignment for both sections is staggered to increase the effective pinning area.

Pinner Superbars are resistor-limited to provide arc-resistant operation. It is this advancement that prevents hard arcs from occurring resulting in several improvements when compared to traditional charging equipment:

- Increased voltage consistency and continuous pinning action
- Reduced EMI/RMI that can disturb sensitive electronic components
- Limited energy release that could otherwise degrade some plastics and other materials causing additional damage and failures



### **CAUTION – Personal Injury Hazard**

Pins are very sharp, be careful when handling Superbars.

### **Receipt of Equipment**

1. Carefully remove the equipment from its carton.
2. Inspect contents for damage that may have occurred during shipment. If any damage has occurred, the local carrier should be notified at once. A report should be forwarded to Simco-Ion, 2257 North Penn Road, Hatfield PA 19440, and (215) 822-6401.
3. Empty the carton to ensure that small parts are not discarded.

### **Return Shipments**

Prior to returning goods, contact a Simco-Ion Customer Service Representative for a Return Authorization Number. This number should be included on the packing list. All correspondence should also reference the Return Authorization Number. Any item being returned should be shipped prepaid and packed to provide adequate protection.

### 3. SPECIFICATIONS

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<b>Ionizing Points</b>	80 Mohm resistor limited, spaced 5/8" between points per row, removable and replaceable for easy maintenance
<b>Operating Voltage</b>	±30 kVDC max (±60 kVDC with special mounting and insulation precautions)
<b>Operating Temperature</b>	0-170°F (-5 to 77°C)
<b>Operating Humidity</b>	70% RH max, no dewing permissible
<b>High Voltage Cable</b>	60 kV rated irradiated polyethylene cable with fire retardant silicone protective tubing; 10' standard length (1/2" min bend radius)
<b>Emitters</b>	Stainless Steel
<b>Dimensions</b>	1 ¼" H x 6 ½" W x 14 ¼" L; effective Pinning Length: 10 ½"
<b>Enclosure</b>	Rugged impact resistant red glass filled polyester
<b>Weight</b>	5 ½ lb

Pinner Superbars are easy to setup, safe to use and produce superior bonding. They are supplied with mounting hardware and are available with either straight or right angle high voltage cable connections. The cable is enclosed within flame-resistant, flexible silicone tubing that provides superior abrasion resistance. The ionizing pins are mounted in sockets and can be replaced when the pins become dull.

## 4. INSTALLATION



### CAUTION – Fire Hazard

Do not install or operate equipment in close proximity to any flammable solvents or flammable materials.



### CAUTION – Fire Hazard

Do not exceed 60 kV supply voltage.

### Determine Superbar Location

- Charging Bar with Grounded Surface** – In Figure 1, the charging bar faces a production fixture that moves beneath the charging bar (alternatively the bar could move over the fixture). After the materials to be pinned together are positioned on the fixture, it moves beneath the charging bar. The negative ions created by the bar are driven toward the grounded metal fixture by an electric field formed between them. The top material blocks ion travel through the field and becomes electrostatically charged, resulting in adhesion between the two materials and the fixture. This arrangement emulates an interleaving application where paper or film is pinned to metal prior to cutting and stacking.

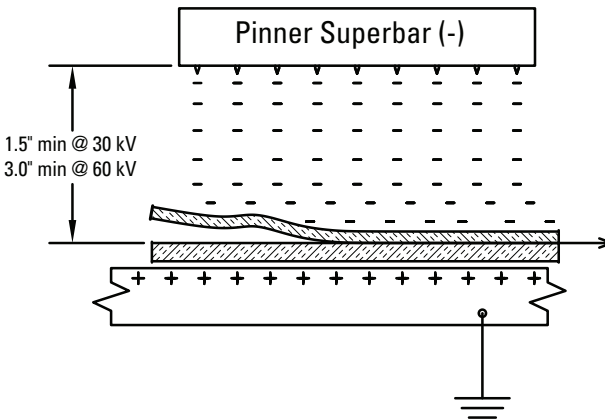


Figure 1

- Charging Bar with Static Neutralizing Bar** – In Figure 2, the charging bar faces an insulative film while a static neutralizing bar faces an insulative sheet of material on the opposite side (glass plastic, light particle board, etc.). As the two materials to be pinned together pass between the bars, the negative ions created by the charging bar charge the film, while the static neutralizing bar attempts to eliminate the apparent charge on the sheet. This deposits a positive charge on the lower sheet. The use of the static neutralizing bar dramatically improves the electrostatic pinning adhesion between the two materials.

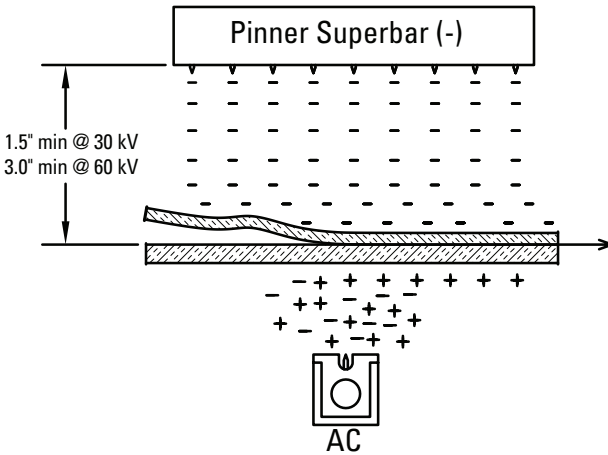


Figure 2

- Two Charging Bars** – In Figure 3, one charging bar faces another of opposite polarity in an application where decorative sheets are pinned to heavy particleboard prior to laminating. As the materials move between the charging bars, the opposite polarity ions created by each bar are driven toward each other by an electric field formed between them. The decorative sheets block ion travel through the field and become electrostatically charged. With this arrangement, the voltage differential between the charging bars can be substantial. The sizeable voltages cause higher levels of electrostatic adhesion. This method of charging materials is generally used in the most difficult pinning applications. Dual polarity BP-series power supplies are designed for applications like this.

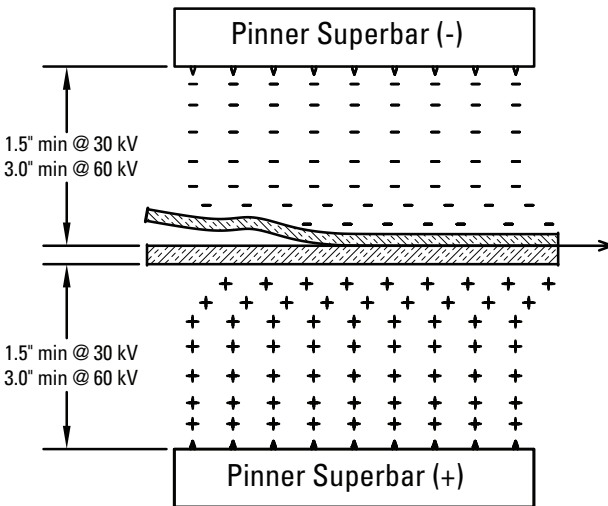


Figure 3

## Mount Superbars



### **CAUTION – Electrical Shock Hazard**

Turn power supply OFF and discharge mounting hardware before touching the Superbar or its high voltage cable.



### **CAUTION – Fire Hazard**

Do not install or operate equipment in close proximity to any flammable solvents or flammable materials.



### **CAUTION – Electrical Shock Hazard**

Only qualified service personnel are to perform installation tasks.



### **CAUTION – Electrical Shock Hazard**

It is essential that the machine frame, and all metal parts in the vicinity, be grounded either through well-grounded electrical conduit or by heavy copper wire connecting the frame to a water pipe.



### **CAUTION – Fire Hazard**

Do not exceed 60 kV supply voltage. Use Superbar with Simco-Ion VCM, VCM BP or KNH34 power supply ONLY.



**NOTE** – Pinner Superbars are shipped from the factory with a 30 kV connector installed on the cable. A 60 kV connector is also supplied and must be installed for use on all Simco-Ion Chargemaster power supplies with ratings of 60 kV Ref. 5101333.



**NOTE** – Do not exceed the 5.0 mA current capacity of the power supply.



**NOTE** – Do not install bars face-to-face less than 3” apart at 30 kV or 6” apart at 60 kV.



**NOTE** – Do not operate bars continuously for more than twenty minutes when equipment is not operating. A photoelectric sensor with a signal OFF delay timer should be used to disable the power supply when no product is traveling between the bars. Energize the bar when the photoelectric sensor senses product flow. Position the sensor upstream of the bars and set the OFF delay timer to 3 minutes and connect the normally open contact of the OFF delay timer to the remote ON/OFF terminal strip located on the rear of the power supply.

1. Determine the best location for the Pinner Superbar using the above applications for guidance. For optimum performance, bars should be positioned away from all ground references as shown in Figure 4.



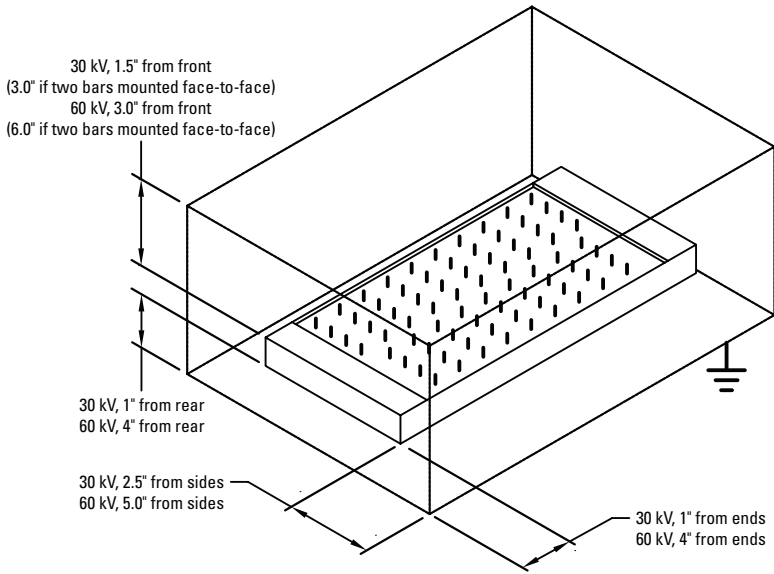


Figure 4

2. Drill clearance holes in an insulating support frame (e.g., fiberglass, phenolic, delrin, nylon, PVC) to accommodate the bar's 1/4" mounting bolts.
3. Insert the head of each 5/16" nonconductive bolt into the keyhole slot in the rear of the charging bar and secure to each mounting rod (see Figure 5).
4. Secure the mounting rods to the insulating support frame using 1/4" fasteners provided.
5. Set the height, if necessary, by cutting the end of each mounting rod (see Figure-5). Assure that the bar is parallel to the target material surface.
6. Tighten all nuts with a wrench after verifying the position and spacing between bars and ground references. Refer to Figures 1-4 for minimum recommended spacing.

### Install High Voltage Cables



#### CAUTION – Electrical Shock Hazard

Ground all surrounding metal parts in the vicinity of the charging bar.

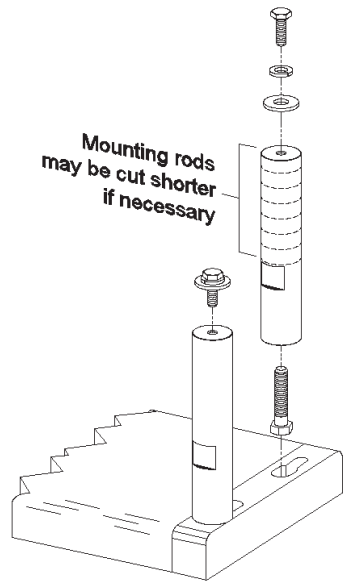


Figure 5



### CAUTION – Fire Hazard

Do not install or operate equipment in close proximity to any flammable solvents or flammable materials.

1. Route the high voltage cable for each charging bar along the machine frame or wall to the power supply. Assure the cable is safely away from all moving parts and sharp edges.
2. Verify that the high voltage cables are run separately from any control cables associated with other electronic equipment. The EMI from high voltage cables may interfere with the operation of sensitive electronic equipment.
3. Assure that the power supply is de-energized and turned off.



### CAUTION – Electrical Shock Hazard

Turn off power supply before connecting or disconnecting the high voltage cable.

4. The Pinner Superbar Cable comes equipped with a 30 kV connector installed (2.25” [57 mm] body length). If the bar is to be operated with a 60 kV Chargemaster power supply, replace the connector with a 60 kV connector (4.125” [105 mm] body length that is included with the Pinner Bar. For connector to cable installation instructions, see 5101333.
5. Insert the cable (with spring loaded connector attached) into the power supply high voltage connection. Screw in the knurled plug to secure the cable.



### NOTE – FINGER TIGHTEN ONLY

20/30 kV units (CH20, VCM30) use 30 kV connector (2.25” [57 mm] body length). 60 kV units (VCM60) use 60 kV connector (4.125” [105 mm] body length).

## Install Optional Mounting Bracket (5051494)



### CAUTION – Electrical Shock Hazard

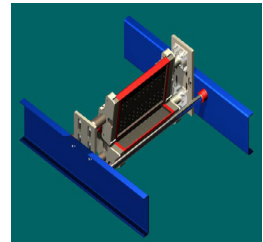
Ground all surrounding metal parts in the vicinity of the charging bar.



### CAUTION – Fire Hazard

Do not install or operate equipment in close proximity to any flammable solvents or flammable materials.

1. The *optional mounting bracket* is designed to fit the inside frame-to-frame dimension on standard incline feed stackers. Position the assembled bracket between the drive belt support idlers (see Figure 5A) with Super Pinner Bars set to maximum open position (full up/down), centering the drive belts between the Super Pinner Bars, and clamp bracket in position. Mark the frame for mounting hole (2 - 5/16”) requirements on each side frame.



2. Remove mounting bracket assembly and drill holes in side frames. Secure mounting bracket using 5/16" carriage bolts provided. Reset the Super Pinner Bars to 3" separation, being sure to keep the drive belts centered between the static bars.
3. Route the high voltage cable as above, **Install High Voltage Cables.**

## 5. OPERATION

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**NOTE** – Do not operate bars continuously for more than twenty minutes when equipment is not operating. A photoelectric sensor with a signal OFF delay timer should be used to disable the power supply when no product is traveling between the bars. Energize the bar when the photoelectric sensor senses product flow. Position the sensor upstream of the bars and set the OFF delay timer to 3 minutes and connect the normally open contact of the OFF delay timer to the remote ON/OFF terminal strip located on the rear of the power supply.



**NOTE** – Do not operate bars face-to-face less than 3" apart at 30 kV, 6" apart at 60 kV.



**CAUTION – Electrical Shock Hazard**

Do not touch Charging Bar during operation.



**CAUTION – Fire Hazard**

Do not operate equipment in close proximity to any flammable solvents or flammable materials.

1. Before energizing any power supply:
  - Ensure that all power supplies are properly grounded.
  - Ensure that all charging bars have been properly located, positioned and installed.
  - Ensure all requirements printed in the applicable power supply instructions have been fully complied with.
2. After the above checks have been performed, simply energize each power supply to operate the charging bars.
3. Setting Strength of Pinning:
  - Decrease power supply voltage to zero before or during power-up depending on power supply model.
  - Slowly increase voltage until pinning action is observed, then increase setting 10% to allow for variation in conditions.
  - If conditions change and the charging bar is operating in electrical stress condition (evident by purple glow on pins and slight sizzling noise), slowly decrease operating voltage of the power supply.
  - If conditions change and adhesion or pinning strength is not adequate, slowly increase operating voltage of the power supply.



**NOTE** – Do not exceed the 5.0 mA current capacity of the power supply.



**NOTE** – Sustained operation in electrical stress will likely interfere with operation of the charging system. Electrical stress reduces output voltage from the power supply and suppresses the charging process. Sustained stressed operation may also damage the bar and power supply.

Always turn the power supply OFF when the system is not in use. For safety and ease of operation, it is recommended to connect the power supply line cord to the electrical system of the machine in such a manner that the power supply is only energized when the machine is in operation.

## 6. TROUBLESHOOTING



**NOTE** – Only qualified service personnel are to perform troubleshooting tasks.

Condition	Possible Cause	Solution
Electrical Stress	Electrical stress can occur between the bar and a ground reference beneath the target material. This stress typically occurs at edges of material being charged and comes from the ion emitter points at the end of the Charging Bar.	Eliminate this stress by gradually reducing the operating voltage from the power supply
Electrical Arcing	If electrical stress occurs between the bar and frame member on which the bar is mounted, the bar may be improperly mounted.  If electrical stress occurs from the end of the bar to the side frame of the machine.	Verify that all equipment has been properly mounted and grounded.  Slide the bar away from the side frame if possible. If it is not possible to do this, it may be necessary to install an arc shield, please call your Simco-Ion representative for more details.
Low Pinning Strength	If pinning strength is not adequate and the power supply is already at maximum output voltage, moving the bar closer to the target material can increase pinning strength.	Reduce the bar-to-material distance until pinning strength is adequate. At this new distance, it may be necessary to adjust the operating voltage of the power supply.



**NOTE** – Do not exceed the 5.0 mA current capacity of the power supply.

- Low pinning strength may also be due to erosion of the emitter points. Sharp points promote the best ionization of air molecules. Inspect the emitter points, if they are visibly eroded or corroded follow these steps:
- Remove contamination by brushing the emitter pins with a nonmetallic brush.
- If acceptable performance is not restored after cleaning, the pins of the Pinner Superbar should be replaced. Remove existing emitter pins using needle-nose pliers and replace with new pins in each socket.
- If acceptable performance is not restored, contact Simco-Ion Customer Service at (215) 822-6401.

## 7. MAINTENANCE

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**NOTE** – Only qualified service personnel are to perform maintenance tasks.



**CAUTION** – Electrical Shock Hazard

De-energize all power supplies before performing any maintenance tasks.

### Cleaning Charging Bars

1. **DAILY:** Dust or dirt around the emitter pins will reduce the effectiveness of the Pinner Superbar. The bar should be cleaned daily to prevent deposits from accumulating. Use the cleaning brush supplied with the bar and then blow off with clean, dry compressed air to remove loose particulate.



**NOTE** – Never scrape emitter pins with hard or sharp objects that may damage their points.

2. **EVERY TWO WEEKS:** Wipe all exterior surfaces of the bar, mounting hardware, and insulated support frame using a clean soft cloth. If necessary, dampen the cloth with isopropyl alcohol to remove inks, conductive contaminants, or resistant coatings.



**CAUTION** – Fire Hazard

Ensure all traces of alcohol have been removed and the static bar is completely dry before energizing the power supply.



**NOTE** – The alcohol must not contain additives. Never use harsh solvents such as lacquer thinner, naphtha or acetone; they will attack the bar housing material.



**NOTE** – Do not pour alcohol directly onto the bars, and do not soak the bar or any of its components in alcohol.

3. EVERY THREE MONTHS: Replace ionizing pins that have become dulled (see Step-B below).

### Replacing Ionizing Pins



**NOTE** – Only qualified service personnel are to perform maintenance tasks.



#### **CAUTION – Electrical Shock Hazard**

De-energize all power supplies before performing any maintenance tasks.

1. A dull or eroded point of an ionization pin causes its pinning strength to decrease. Sharp points promote the best ionization. It is recommended that ionization pins be replaced after no more than three months of service.
2. Visually inspect ionizing pinpoints for corrosion.
3. Remove all corroded pins from their sockets using needle-nose pliers.
4. Insert new ionizing pins back into their sockets.

### Replacing HV Connectors



**NOTE** – Only qualified service personnel are to perform maintenance tasks.



#### **CAUTION – Electrical Shock Hazard**

**Turn off power supply before connecting or disconnecting the high voltage cable.**

1. Loosen the setscrew of the spring-loaded terminal using a 5/64” hex key or allen wrench.
2. Remove the high voltage connector from the cable and replace with the correct high voltage connector.
3. Assure that the conductor of the high voltage cable is fully inserted into the spring-loaded terminal of the new high voltage connector by completely removing the setscrew from the threaded hole to allow viewing of the conductor through the hole.
4. Hold the cable firmly in place when the conductor of the high voltage cable is visible through the threaded hole.
5. Carefully tighten the setscrew onto the conductor once the holes of the spring-loaded terminal and insulating tube are properly aligned.

See #5101333 instructions for further details.

## **8. WARRANTY**

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Simco-Ion warrants its products to be free of defects in components, workmanship, or materials for a period of one year from date of purchase. This warranty does not apply to any physical or electrical damage caused by misuse, abuse or negligence (such as any modifications made to the unit or service work done by any other than SIMCO-ION authorized technicians). Any unit with altered or removed serial number is ineligible for warranty.

Simco-Ion will not be liable for loss or damage due directly or indirectly to an occurrence or use for which the product is not designed or intended. In no event shall Simco-Ion be liable for incidental or consequential damages except where state or regional laws override.

This warranty extends to the original purchaser and is not transferable. No person, agent, distributor, dealer or company is authorized to change, modify, or amend the terms of this warranty in any manner whatsoever.

All products returned must have an “RA” (Return Authorization) number regardless of warranty status. Call Simco-Ion for an assigned RA number.

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