



Modulated Pulse AeroBar[®]

MODEL 5635M

Simco-Ion's Model 5635M AeroBar MP ionizing bar is specifically designed to eliminate static charge in semiconductor and other ultra-clean manufacturing processes where fast discharge time, low swing voltages and precision balance are required, but exposed metallic surfaces are not permitted. The Model 5635M utilizes MP technology, combining a high-frequency sine wave with modulated pulses (MP) for high ion output and delivery. This breakthrough technology enables AeroBar mounting within 150 mm of the wafer. MP technology, combined with ultra-clean silicon emitter points and precision adjustment, provides ISO 14644-12 ionization (0.01 μm particles or nanoparticles) and ISO 14644 Class 1 (0.1 μm particles) cleanliness, critical for smaller technology nodes. For processes that do not require extreme cleanliness, the optional air-assist accelerates ion delivery, providing faster discharge times and performance over longer distances. MP technology is easy to adjust and features the ability to fine-tune voltage, frequency and balance to meet differing environmental and product sensitivity requirements. Shorter bars (≤ 600 mm) feature 50 mm spacing between nozzles, to improve ion distribution in close applications.

Features

- ISO 14644-12 (0.01 μm particles) cleanliness
- Modulated pulse technology
- Metal-free design "M"
- Excellent lateral uniformity
- Low field voltages
- Air-assist capability
- Optional software with easy-to-use interface with wide adjustability
- Alarm output signal

Benefits

- Compatible with all wafer technology nodes including 14 nm and below
- Precision balance, high ion output with long-term stability
- Perfect for "No Metal" applications
- Uniform balance across the AeroBar
- Safe placement as close as 150 mm of the wafer or reticle
- Enhanced static charge neutralization at fast automation speeds
- Fast setup and easy optimization in any environment
- Communicate to tool or facility monitoring system



Specifications

Input Voltage	24 VDC ±10%
Output Voltage	13.5 kV p-p (max), adjustable
Distance	150-1000 mm distance to surface; application & customer specification dependent
Frequency	Default setting at 5 Hz; adjustable from 1-33 Hz
Balance	Auto balancing system <±20V over time and across the bar length (measured in a controlled environment at 24" distance)
Ion Emission	Modulated pulse (MP) technology
Emitter Points	Single crystal silicon emitter points
Emitter Pitch	50 mm spacing between nozzles on 350-600 mm length bars; 75 mm spacing on longer bars
Ionization Performance	15 sec (typ) with no air-assist, Vp-p Swing of 80 Vp-p; measured at 24" below an emitter center group of points
Cleanliness	Meets ISO 14644-12 cleanliness (0.01 µm particles or nanoparticles) and ISO 14644 Class 1 (0.1 µm particles) using 45-50% output voltage setting
Air Supply	Clean dry air (CDA) or nitrogen
Airflow	45 psi max gas pressure; 1-3.5 lpm/nozzle thru 8 mm OD one-touch fitting (optional)
Ozone	<0.05 ppm
EMI	Below background level
Operating Env.	Temperature 15-35°C (59-95°F); humidity 30-60% RH, non-condensing
Bar Settings	DIP switches for general power settings; trim pots for fine tuning balance, frequency, and power output or use the serial output to the MP 5635 Bar Control software for fine adjustments
Enclosure	ABS chassis (ground plate – carbon filled ABS)
Dimensions	3.1H x 1.3W x 18/24/34/39/45/51/57/63/69/75/81/87/93L in. (78H x 34W x 450/600/850/1000/1150/1300/1450/1600/1750/1900/2050/2200/2350L mm)



Model 5601 Power Distribution Box

Input Voltage	24 VDC for each bank of 4 bars; 5.6A total (0.7A max/port)
Communication	Ethernet (RJ-45) to/from PC; individual bar standby inputs
Alarm Output	Relay closure to ground
Output	8 RJ-45 ports (1 for each 5635 bar)
LED Indicators	Green PWR, Yellow COM, Red ALM, Blue USB
Weight	15 oz (420g)
Dimensions	1.2H x 6.3L x 3.6W in (3.1H x 16.0L x 9.2W cm)
Certifications	

Simple Installation

The Model 5635M ionizing bar is quickly installed by simply plugging into a 24 VDC source and connecting an air line, (if air-assist is desired). Set the DIP switches for general power levels as defined in the user's manual to activate factory settings for a base discharge performance. Users can then fine-tune the control parameters from the bar or through the easy to use software GUI for installations where optimized balance, swing voltage and discharge times are desired. An alarm connection in the Signal and Power Junction Box enables a signal output to the tool or central computer for FMS monitoring.

Cleanliness

Model 5635M is designed to operate in and maintain ISO 14644-1 Class 1 cleanliness (10 particles or less per m³ for particles of 0.1 micron and larger). Model 5635M will also perform to ISO 14644-12 cleanliness (1200 particles or less per m³ (34 particles per ft³) for particles of 0.01 micron and larger) when operated at 45-50% output voltage setting and OpenJet nozzles with single crystal silicon emitters.

ISO Class 1 for 0.1 and 0.01 Micron Particles

ISO 14644-1 (1999) establishes 9 particulate class limits. A class is met when airborne particles-per-cubic-meter (or particles-per-cubic-foot) do not exceed the class limit. The following graph summarizes the class limit lines for particles between 0.1 micron and 5 microns.

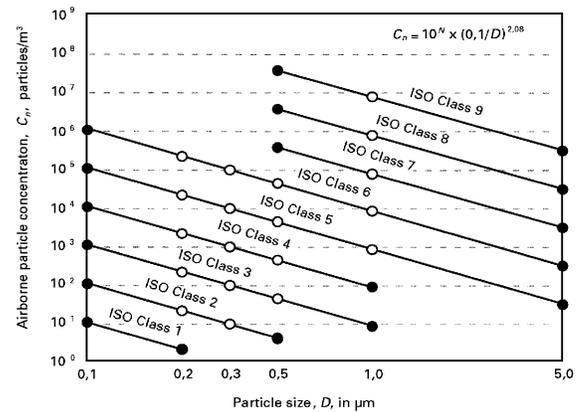


Chart from ISO 14644-1: Annex A - Informative.

Power Distribution Box (optional)

The Model 5601 Power Distribution Box can be used to centralize power and software control for up to 8 MP AeroBars.

Ordering Information

91-5635M-xxxx-yy-zzzzz	xxxx (bar lengths): -350*/450*/600*/850/1000/1150/1300/1450/1600/1750/1900/2050/2200/2350 mm; yy (nozzle spacing): -50 for 50 mm, -75 for 75 mm; zzzzz (nozzle type): OpenJet
33-5601-03	Power Distribution Box
14-21241	Power Supply (Power Distribution Box only) (an appropriate power cord is required)
33-21491	Signal and Power Junction Box for FMS
92-5635-001	AeroBar MP Remote Serial Adapter Kit (includes RJ-45 splitter, serial to USB adapter, RJ-45 to DB9)
33-25625	24 VDC Power Converter Box with Signal and Power Junction Box Kit
25-0540-xx	CATS with RJ-45 Ethernet Cable in 6', 10', 15' lengths, white
32-2212-01	Flat Mounting Bracket (Delrin); recommended usage: 350-1100 mm 2 brackets, 1350-1650 mm 3 brackets, 1800+mm 4 brackets
32-2214-01	Bracket Swivel (Delrin)
32-2215-01	Bracket Assembly (Delrin) includes 32-2212-01 & 32-2214-01

*The 350, 450 and 600 mm are only available with 50 mm nozzle spacing.



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