



Modulated Pulse AeroBar[®]

MODEL 5635M

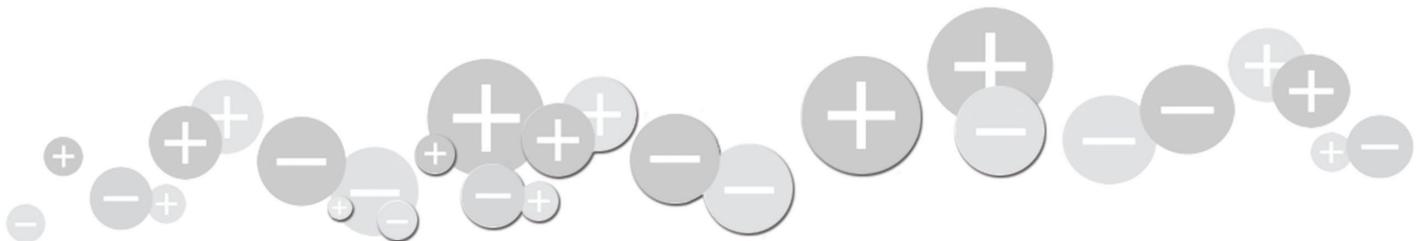
Simco-Ion's Model 5635M AeroBar MP ionizing bar is specifically designed to eliminate static charge in semiconductor and other ultra-clean manufacturing processes where fast discharge time, low swing voltages and precision balance are required, but exposed metallic surfaces are not permitted. The Model 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 from the wafer. MP technology, combined with ultra-clean silicon emitter points and precision adjustment, the 5635M MP bar exceeds ISO 14644-1 Class 1 cleanliness to meet the Extended ISO Class 1* level for particles down to 10 nm. 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

- Extended ISO Class 1* (0.01 mm particles) cleanliness
- Modulated pulse technology
- Metal-free design "M"
- Excellent lateral uniformity
- Low field voltages
- Air-assist capability
- Optional software with an easy-to-use interface
- Alarm output signal

Benefits

- Compatible with all wafer technology nodes including 14 nm and below
- Precision balance, high ion output, long-term stability
- Perfect for "No Metal" applications
- Uniform balance across the AeroBar
- Safe placement as close as 150 mm from 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
Emitters	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 14644-1 (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; trimpots 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	3.1"H x 1.3"W x 14/18/24/34/39/45/51/57/63/69/75/81/87/93"L (78 x 34 x 350/450/600/850/1000/1150/1300/1450/1600/1750/1900/2050/2200/2350 mm)
Certifications	
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)
Indicators	Green PWR, Yellow COM, Red ALM, Blue USB LEDs
Weight	15 oz (420g)
Dimensions	1.2"H x 6.3"L x 3.6"W (3.1 x 16.0 x 9.2 cm)
Certifications	

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.

Simple Installation

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

Cleanliness—Extended ISO Class 1*

Model 5635M is designed to operate in and maintain ISO 14644-1 cleanliness (10 particles or less per m³ for particles of 0.1 micron and larger). Model 5635M will also perform to Extended ISO Class 1* level for particles down to 10 nm 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.

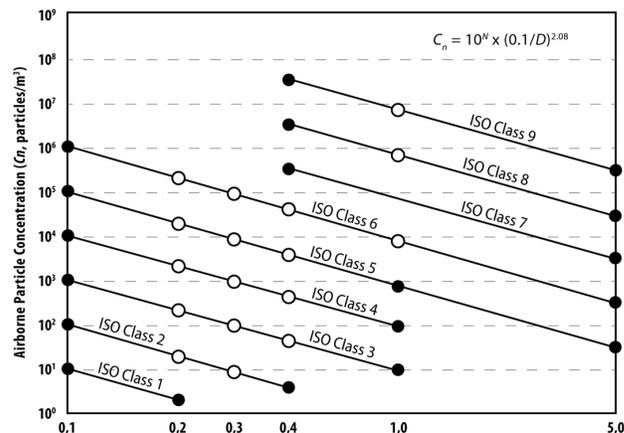


Chart from ISO 14644-1: Annex A - Informative.

Ordering Information

91-5635M-xxxx-yy-zzzz	xxxx: -350 ¹ /450 ¹ /600 ¹ /850 ¹ /1000 ¹ /1150 ¹ /1300 ¹ /1450 ¹ /1600 ¹ /1750 ¹ /1900 ¹ /2050 ¹ /2200 ¹ /2350 mm bar lengths yy: -50 for 50 mm nozzle spacing, -75 for 75 mm nozzle spacing zzzz: OpenJet nozzle type
91-5635MNA-xxxx-yy-zzzz	xxxx: -350 ¹ /450 ¹ /600 ¹ /850 ¹ /1000 ¹ /1150 ¹ /1300 ¹ /1450 ¹ /1600 ¹ /1750 ¹ /1900 ¹ /2050 ¹ /2200 ¹ /2350 mm bar lengths yy: -50 for 50 mm nozzle spacing, -75 for 75 mm nozzle spacing zzzz: No Air Jet nozzle type
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	CAT-5 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)
33-2215-01	Bracket Assembly (Delrin) includes P/N 32-2212-01 & P/N 32-2214-01

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

* Extended ISO Class 1: An extrapolation of ISO 14644-1 down to 0.01 micro (10 nm) particles, measured with a condensation nucleus counter (CPC). For more information, visit www.simco-ion.com/technology/resources for our technical notes on Extended ISO Class 1.

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