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Ionization Solutions

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Photon Pin Ionizer

MODEL 4901

The Model 4901 Photon Pin Ionizer is designed to eliminate static charge in semiconductor and other ultra-clean manufacturing processes requiring fast discharge time, low swing voltages, and precision balance. Model 4901 utilizes a soft X-ray source, a form of light, and does not require an air supply to deliver ionized molecules.

Soft X-rays are easily absorbed by the atmosphere, generating an equal number of positive and negative ions. Charged objects in the proximity of these positive and negative ions attract the opposite polarity ions, neutralizing the charge on the object. Photon ionization is an advanced and essential solution for effective ESD, ESA, and contamination control.

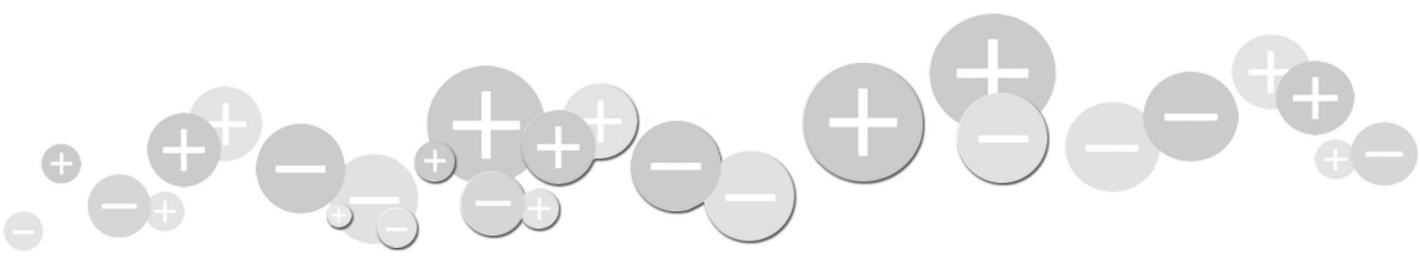
The Model 4901 Photon Pin Ionizer is designed with a convenient, integrated head system that accommodates narrow, confined-space and in-tool applications.

Features

- Suitable for critical cleanliness control
- Low voltage tube type
- Pin-type designed for narrow, confined space, and in-tool applications
- Alarm output signal

Benefits

- **Perfect ion balance**—Photon ionizers are naturally free from ion balance issues since they produce an equal number of positive and negative ions when molecules are exposed to soft X-ray energy
- **Free from particle attraction**—While CDA and laminar airflow help the decay time performance, Photon Ionizers utilize soft X-ray technology and do not need an air supply for operation, so no contamination particles are generated
- **No maintenance is required**—Unlike conventional ionizers of Corona discharge on emitter tips, Photon ionizers do not need any cleaning or ion balance tuning during their lifetime



Model 4901	
Power Input	24 VDC, 60W
Discharge	<1 sec @ 6" (15.2 cm); ±1,000V to ±100V
Balance	Inherently balanced 0V
Ion Emission	Soft X-ray Technology
Emitter	Photon generating tube with beam angle 150° in tube type Type: Hot filament Voltage: 4.98 kV Current: 400 µA (max), on-site receptacle
Cleanroom Class	Zero particle generation
LED Indicator	Run, Lifetime, Alarm
Alarm	Head fail, System fail
Operating Env	32-122°F (0 to +50°C); 35-85% RH, non-condensing
HV Cable	0.26" dia x 3.3"L (8.0 cm x 1m)
Optional	Time Reader
Enclosure	Aluminum and 304 Stainless Steel
Dimension	Pin Head: 0.94" dia. x 3.35"L (2.40 x 8.50 cm) Ionizer: 3.3" x 1.3" x 4.8"L (8.38 x 3.40 x 12.4 cm) with bracket
Weight	0.875 lb (0.40 kg)
Warranty	One year limited warranty
Certification	CE, UL pending

Optional External Time Reader

Each unit includes a time data recorder. However, the pin ionizer does not have a separate control unit or display capability. An optional External Time Reader communicates with the ionizer to receive and display the accumulated running time data using the RS-485 connector terminal.

Ordering Information

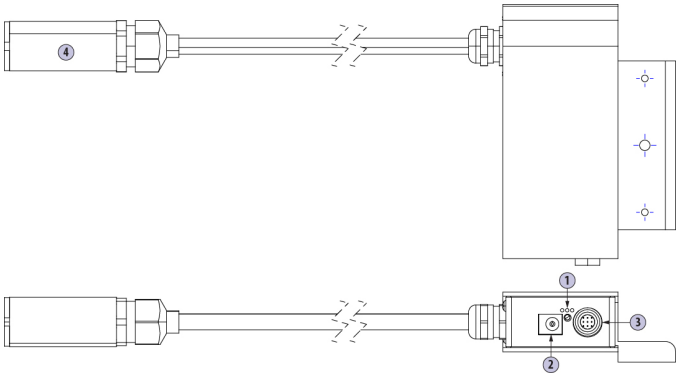
91-4901P-1M-02	Pin Head with Photon Generating Tube and 1m HV cable to Ionizer
14-21340	Power adaptor, 24 VDC (IEC power cord required, contact Sales Services for detail)
25-1335-15	Adapter extension cable, 49 ft (15m) length
25-4905-5M	I/O signal cable, 16.4 ft (5m) length
33-0004-01	Hardware kit (1/4"-20 UNC and M4 x 0.7)
91-4901TR-01	Time Reader, optional
32-4903ST-01	Replacement Photon Generating Tube

Shielding Material (personal protection may be required by installing proper materials and thickness)	
Shielding	**Thickness**
Stainless Steel	0.008" (0.2 mm)
Aluminum	0.016" (0.4 mm)
PVC	0.024" (0.6 mm)
Glass	0.028" (0.7 mm)
Acrylic	0.315" (8 mm)

Required thickness is subjected to the distance from the soft X-ray window.(* d=10 cm).

Pin Design

The small "pin" type unit, with its fast discharge time, low swing voltages, and precision balance, is designed to accommodate narrow, confined spaces and in-tool applications in semiconductor and other ultra-clean manufacturing processes.



1. **LED Status Indicator**: One 3-color LED indicates operating status:

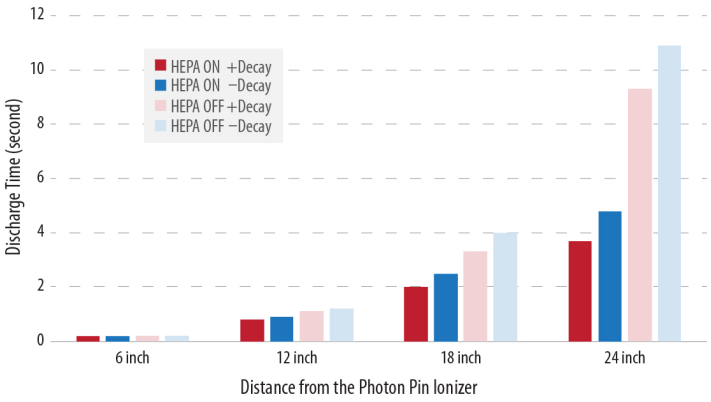
Green: ON during normal operation

Orange: ON when Photon Generating Tube needs to be replaced

Red: ON when the tube fails

2. **DC Power Jack**: Power input jack supplying power to the unit.
3. **Signal Connect**: I/O connector to external devices.
4. **Photon Generating Tube**: Soft X-ray emitted from window to neutralize static electricity

Discharge Time Performance



Tested by centering CPM below the ionizer. HEPA ON is with 100 fpm laminar airflow from 9.5 inch (241 mm) above the ionizer.

The electrostatic removal performance is evaluated by measuring the time it takes for the metal plate to discharge from ±1000V to ±100V by the photon ionizer.

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DS-4901P-02_V1- 6/24

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