



# 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.

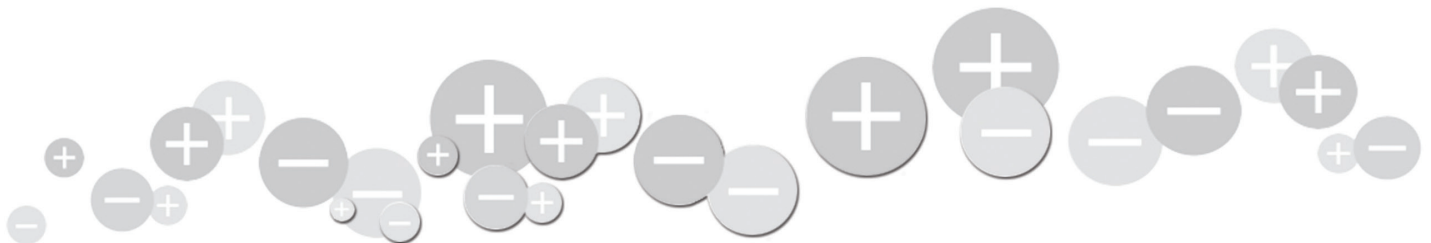
The Model 4901 Photon Pin Ionizer is designed with a convenient, integrated head system that accommodates narrow, confined-space and in-tool applications.

### 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	
<b>Power Input</b>	24 VDC, 60W
<b>Discharge</b>	<1 sec @ 6" (15.2 cm); $\pm 1,000V$ to $\pm 100V$
<b>Balance</b>	Inherently balanced OV
<b>Ion Emission</b>	Soft X-ray Technology
<b>Emitter</b>	Photon generating tube with beam angle 150° in tube type Type: Hot filament Voltage: 4.98 kV Current: 400 $\mu A$ (max), on-site receptacle
<b>Cleanroom Class</b>	Zero particle generation
<b>LED Indicator</b>	Run, Lifetime, Alarm
<b>Alarm</b>	Head fail, System fail
<b>Operating Env</b>	32-122°F (0 to +50°C); 35-85% RH, non-condensing
<b>HV Cable</b>	0.26" dia x 3.3"L (8.0 cm x 1m)
<b>Optional</b>	Time Reader
<b>Enclosure</b>	Aluminum and 304 Stainless Steel
<b>Dimension</b>	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
<b>Weight</b>	0.875 lb (0.40 kg)
<b>Warranty</b>	One year limited warranty
<b>Certification</b>	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

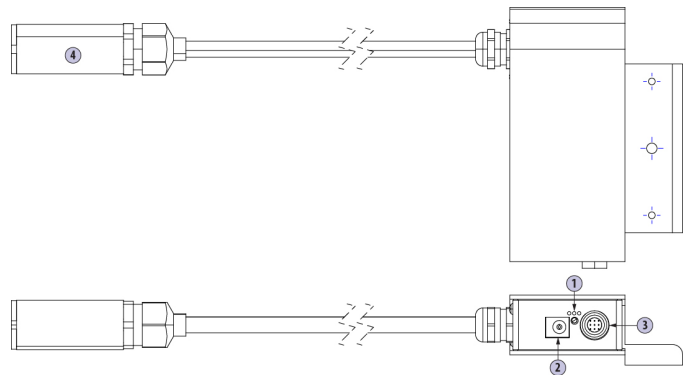
<b>91-4901P-1M-02</b>	Pin Head with Photon Generating Tube and 1m HV cable to Ionizer (DC adapter and cables not included)
<b>14-21340</b>	Power adaptor, 24 VDC (IEC power cord required, contact Sales Services for detail)
<b>25-1335-15</b>	Adapter extension cable, 49 ft (15m) length
<b>25-4905-5M</b>	I/O signal cable, 16.4 ft (5m) length
<b>33-0004-01</b>	Hardware kit (1/4"-20 UNC and M4 x 0.7)
<b>91-4901TR-01</b>	Time Reader, optional
<b>32-4903ST-01</b>	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.

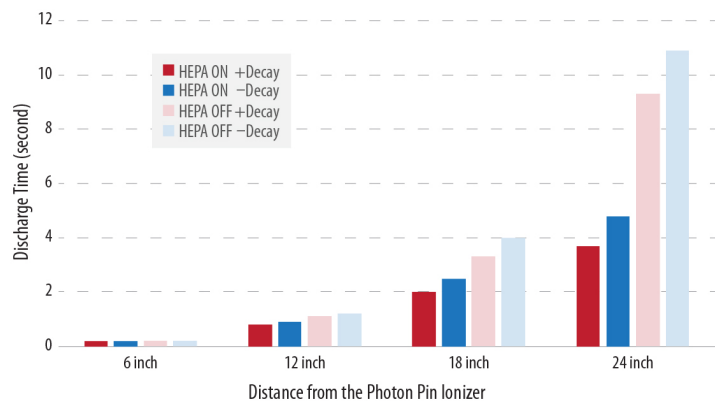


1. **LED Status Indicator:** One 3-color LED indicates operating status:

- **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  $\pm 1000V$  to  $\pm 100V$  by the photon ionizer.

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DS-4901P-02\_V1- 5/24  
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