Pulse AC Method

Area Ionizer

ER-X SERIES
High-Speed, Wide Area Charge Removal

"Fast Charge Removal", "Airless", "Low-Pressure". Three charge removal modes for diverse application coverage

The ER-X series offers an airless charge removal capability to eliminate the need for compressed air in addition to low pressure and high speed compressed air based modes. Furthermore, it supports dual-head configurations for expanded application coverage.

Massive ion discharge when using air reduces charge removal time

By applying a compressed air source, the ion volume increases providing an improved tact time for substrate ionization. This makes the ER-X suitable for applications such as electronic paper and thin film solar cells, where charge removal time is directly linked to productivity.

Prevents dust dispersion and cleanliness degradation!

The ER-X series can effectively remove surface charges with an air pressure of less than 0.05 MPa. With the advantage of minimal dust dispersion, it is suitable for charge removal in semiconductor, FPD (mobile panel), and other applications that require high degree of cleanliness. The presence of air also helps prevent adhesion of dust to the discharge needles, requiring less cleaning than in the airless charge removal mode.
Pulse AC method for faster charge removal

The ER-X series has adopted the pulse AC method that alternately applies positive and negative voltages to each discharge needle. This enables generation and discharge of a large amount of ions, resulting in faster charge removal. Select from eight pulse frequencies according to your application, from 100 Hz for charge removal on nearby or moving workpieces to 1 Hz for charge removal on far-away workpieces or in a three-dimensional space.

Charge removal time characteristics (TYPICAL)
Measured at a charge removal distance of 100 mm (3.937 in) using a 150 × 150 mm (5.906 × 5.906 in) CPM (at center of CPM).

Automatic ion balance control
The ER-X series provides an automatic ion balance control mechanism that senses the amount of ions being generated (which changes according to environmental factors) and compensate for this deviation in the controller, thus maintaining a highly stable ion balance as an original operator setting.

SPOT TYPE HEAD

ER-X001
Effective charge removal width: 50 mm (1.969 in) approx.

0.3 sec. or less*1 fastest charge removal achieved with pulse AC method spot type ionizer*2
The pulse AC method enables the ER-X001 to generate and discharge a large amount of ions, which makes charge removal faster. Furthermore, as a spot type ionizer, it achieves the fastest charge removal of 0.3 sec. or less*2 (±1,000 V → ±100 V).

*1: As of March 2016, in-company survey
*2: Spot diameter of ø15 mm (0.591 in) or less

Supports airless and low-pressure charge removal, which means charge removal is possible without blowing away tiny work pieces

Free head placement is possible thanks to flexible cable with internal air tube

Air supply port angle can be adjusted
ER-X001 high-voltage unit
Joint for ø6 mm (ø0.236 in) air tube
360° angle adjustment
**Super-compact slim head**

By thoroughly redesigning the discharge needle, we have created a super-compact slim head that combines high-speed charge removal*1 with a maintenance-saving design*2. The ER-X series can be embedded in, or retrofitted onto, equipment that did not provide enough space for antistatic measures in the past.

*1: Pulse AC method with built-in air tubes (max. pressure 0.5 MPa)
*2: Discharge needle air barrier structure, discharge needle unit for simple need replacement

**Flat discharge surface for easy cleaning**

The ER-X series heads have a flat discharge face, allowing effortless cleaning of the discharge needles and air outlets by simply brushing along the groove provided.

**Discharge needle air barrier design for reduced contamination**

A barrier of clean air around the discharge needle keeps foreign matter from adhering to it, preventing degraded performance. Additionally, by using separate air sources for the discharge needle barrier and ion transport, the ER-X series keeps discharge from becoming unstable due to pressure concentration, allowing the device to efficiently generate and transport ions.

**High and low temperature resistant type head also available**

ER-X□HC

Bar type head compatible with ambient temperatures of -60 to +200 °C -76 to +392 °F is available.

**Commercial brush**

Groove

Discharge needles

Air outlets

**Angle adjustment screw**

30 mm (1.181 in)

22 mm (0.866 in)

360-degree angle adjustment

**Effective charge removal width**

- **ER-X008**: 80 mm 3.150 in approx.
- **ER-X016**: 160 mm 6.299 in approx.
- **ER-X032**: 320 mm 12.598 in approx.
- **ER-X048**: 480 mm 18.898 in approx.
- **ER-X064**: 640 mm 25.197 in approx.

**360-degree angle adjustment**

**Carefully designed to prevent contamination in manufacturing processes**

In consideration of the manufacturing process (secondary cells etc.), the ER-X series heads neither use copper nor plate processing. This minimizes the risk of contamination with foreign substances.

**Discharge needle unit for simple needle replacement**

The removable discharge needle unit (including a set of four needles) substantially simplifies maintenance. To remove the unit, just slide it toward both ends as indicated by the arrows.
Area Ionizer ER-X SERIES

Equipped with charging function
The charging function is useful when charging paper or parts for static electricity adsorption transport.
Notes: 1) Head 2 performs the ordinary charge neutralizing operation.
   2) The ER-X001 cannot use the charging function.
   (Discharge operation stops.)

All-in-one model equipped with various functions for optimal removal of charge

Level meter indicator (green)
Indicates static buildup around the head or the amount of ion generated from the head.

Discharge control switch
Turn ion generation on and off.

SET UP button
Determine the settings of discharge frequency and ion balance.

Discharge control input
Turn ion generation on and off from an external device.

Alarm output, error output
Report maintenance timing and malfunctions to an external device.

Discharge indicator (green)
Lights up during discharge.

CHECK indicator (orange)
Lights up when dirt, wear, etc. of the discharge needle is detected.

ERROR indicator (red)
Lights up when abnormal discharge is detected.

Discharge frequency setting switch
Select from eight ion generation frequencies ranging from 100 Hz to 1 Hz according to your application.
Head 1 can be used as a charger when the discharge frequency setting switch for Head 1 is set to “+ Charge” or “- Charge.”
Notes: 1) Head 2 performs the ordinary charge removal operation.
       2) The ER-X001 cannot use the charging function.
       (Discharge operation stops.)

Ion balance setting switch
Adjust the ion balance to any of 15 levels according to the strength of the charge on the workpieces.

Various setting switch
- Check level changeover switch
  Set the maintenance notification level to “standard” or “high-sensitivity.”
- Ion balance control switch
  Enable or disable the ion balance auto control function.
- Indicator changeover switch
  Set the level meter indicator display mode to “charge strength display” or “ion generation volume display.”
- 2 heads control switch
  Set the ion generation timing for the two heads to “synchronize” or “inverse.”
- Error output changeover switch
  Set the error output condition to “generation of abnormal discharge” or “generation of abnormal discharge + discharge stop setting ON.”

Dual head configuration for enhanced charge area and layout expansion

1 controller + 2 heads

• Different heads can be combined.
  * The new-type controller, ER-XC02, allows simultaneous connection of the bar type head and spot type head.
• Charge removal is possible with a layout that places heads on either side of the workpiece.
• The charge removal efficiency can be increased by synchronizing the two heads.

ER-XC02 CONTROLLER

Different heads can be combined.
* The new-type controller, ER-XC02, allows simultaneous connection of the bar type head and spot type head.
Charge removal is possible with a layout that places heads on either side of the workpiece.
The charge removal efficiency can be increased by synchronizing the two heads.

1 controller + 2 heads

Controller

High-voltage unit

Head 1

High-voltage unit

Head 2
APPLICATIONS

- Preventing electrostatic damage during bonding
- High-speed charge removal on a taping machine
- Airless charge removal of minute components on a conveyor belt
- Removal of static charges on laminate film
- Prevention of part feeder clogging
- High-speed charge removal on FPCs
- Charge removal and dust removal while separating TAB protective film
- Charge removal of molded plastic components on a conveyor belt
- Charge removal and dust removal of digital camera cases on a conveyor belt
- Removing dust during instrument panel assembly
- Removing dust during food product cup transport
- Preventing adhesion of molded parts to molds

High and low temperature resistant type ER-X-HC
# ORDER GUIDE

## Heads

<table>
<thead>
<tr>
<th>Type</th>
<th>Appearance</th>
<th>Charge removal time (±1,000 V→±100 V)</th>
<th>Ion balance</th>
<th>Effective charge removal width</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spot type</td>
<td>![Spot type Image]</td>
<td>0.3 sec. or less (Note 1), 0.5 sec. or less (Note 2)</td>
<td>±30 V or less (Note 2, 3)</td>
<td>50 mm 1.969 in approx.</td>
<td>ER-X001  (Note 4)</td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>80 mm 3.150 in approx.</td>
<td>ER-X008  (Note 4)</td>
<td></td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>160 mm 6.299 in approx.</td>
<td>ER-X008HC (Note 5)</td>
<td></td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>160 mm 6.299 in approx.</td>
<td>ER-X016  (Note 5)</td>
<td></td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>160 mm 6.299 in approx.</td>
<td>ER-X016HC (Note 5)</td>
<td></td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>160 mm 6.299 in approx.</td>
<td>ER-X032  (Note 5)</td>
<td></td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>160 mm 6.299 in approx.</td>
<td>ER-X032HC (Note 5)</td>
<td></td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>160 mm 6.299 in approx.</td>
<td>ER-X048  (Note 5)</td>
<td></td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>160 mm 6.299 in approx.</td>
<td>ER-X048HC (Note 5)</td>
<td></td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>160 mm 6.299 in approx.</td>
<td>ER-X064  (Note 5)</td>
<td></td>
</tr>
<tr>
<td>Bar type</td>
<td>![Bar type Image]</td>
<td>1 sec. or less (Note 2)</td>
<td>160 mm 6.299 in approx.</td>
<td>ER-X064HC (Note 5)</td>
<td></td>
</tr>
</tbody>
</table>

Notes:  
1) Typical value in condition of discharge distance 50 mm 1.969 in, center of the product, discharge frequency 50 Hz and air supply 60 ℓ/min. (0.3 MPa).  
2) Typical value in condition of discharge distance 100 mm 3.937 in (ER-X001: 50 mm 1.969 in), center of the product, discharge frequency 50 Hz (ER-X:.HC: 30 Hz) and no air supply.  
3) Ion balance refers to the average value of plus and minus. The specification value is the typical one in condition used when ambient temperature change is less than ±10 °C, ion balance is set after 30 minutes from the discharge start, the ion balance control function is set ON.  
4) The ER-X001 and ER-X008 must be combined with the new-type ER-XC02 controller. For the identification of previous-type and new-type controllers and for the combination with the head, refer to p.16.  
5) The ER-X:.HC high / low temperature resistant type head can be used under temperatures from -60 to +200 °C -76 to +392 °F. Be sure to use this head in combination with the new-type controller, ER-XC02. For the identification of previous-type and new-type controllers and for the combination with the head, refer to p.16.
# ORDER GUIDE

<table>
<thead>
<tr>
<th>Controller</th>
<th>Please order power cable or AC adapter separately.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Appearance</th>
<th>Model No.</th>
<th>Number of heads connected</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard type</td>
<td></td>
<td>ER-XC02</td>
<td>Max. 2 units</td>
<td>PhotoMOS relay</td>
</tr>
</tbody>
</table>

**Head connection cables**

Head connection cable is not supplied with the head. Please order it separately.

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ER-XCCJ2H</td>
<td>Length: 2 m 6.562 ft, Net weight: 120 g approx.</td>
</tr>
<tr>
<td></td>
<td>ER-XCCJ5H</td>
<td>Length: 5 m 16.404 ft, Net weight: 290 g approx.</td>
</tr>
<tr>
<td></td>
<td>ER-XCC10H</td>
<td>Length: 10 m 32.808 ft, Net weight: 560 g approx.</td>
</tr>
</tbody>
</table>

*Note: Cannot be used with the high and low temperature resistant type head ER-X□HC.*

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## OPTIONS

<table>
<thead>
<tr>
<th>Designation</th>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power cable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER-XCC2</td>
<td>Length: 2 m 6.562 ft, Net weight: 80 g approx.</td>
<td>0.15 mm² 10-core cable with both connector</td>
</tr>
<tr>
<td>ER-XCC5</td>
<td>Length: 5 m 16.404 ft, Net weight: 190 g approx.</td>
<td>Cable outer diameter: ø5.3 mm ø0.209 in</td>
</tr>
<tr>
<td>AC adapter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER-XAPS-EX</td>
<td>IN: 100-240 V AC, 50/60 Hz OUT: 24 V DC, 1.5 A</td>
<td>Ambient temperature: 0 to +40 °C / +32 to +104 °F</td>
</tr>
<tr>
<td>ER-XAPS</td>
<td>Cable length between connector and AC adaptor: 1.8 m 5.905 ft</td>
<td>Ground wire: 3.7 m 12.139 ft</td>
</tr>
<tr>
<td>AC cable</td>
<td>CN-ACCN-C2</td>
<td>AC cable (conforming to CCC), Length: 2 m 6.562 ft</td>
</tr>
<tr>
<td></td>
<td>CN-ACKR-C2</td>
<td>AC cable (conforming to KTL), Length: 2 m 6.562 ft</td>
</tr>
<tr>
<td>Discharge needle unit</td>
<td>ER-XANT</td>
<td>For ER-X016/X032/X048/X064. (Note 2)</td>
</tr>
<tr>
<td></td>
<td>ER-XANT1</td>
<td>For ER-X001.</td>
</tr>
<tr>
<td></td>
<td>ER-XANT2</td>
<td>For ER-X008.</td>
</tr>
<tr>
<td></td>
<td>ER-XANTHC</td>
<td>For ER-X016HC/X032HC/X048HC/X064HC.</td>
</tr>
<tr>
<td></td>
<td>ER-XANT2HC</td>
<td>For ER-X008HC.</td>
</tr>
<tr>
<td>Discharge part protective cover</td>
<td>ER-XACVR</td>
<td>For ER-X016/X032/X048/X064. (Note 2)</td>
</tr>
</tbody>
</table>

*Notes: 1) Rating of the AC cable is 125 V AC. If the voltage used exceeds 125 V AC, prepare a proper cable by yourself or purchase our optional cable CN-ACCN-C2 or CN-ACKR-C2. And, the AC cable is not enclosed with ER-XAPS-EX.
2) Cannot be used with the high and low temperature resistant type head ER-X□HC.
3) The number of set(s) you need depends on the head model No.*

<table>
<thead>
<tr>
<th>Model No.</th>
<th>ER-X016</th>
<th>ER-X032</th>
<th>ER-X048</th>
<th>ER-X064</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of set (2 pcs per set)</td>
<td>1 set</td>
<td>2 sets</td>
<td>3 sets</td>
<td>4 sets</td>
</tr>
</tbody>
</table>
### Heads

<table>
<thead>
<tr>
<th>Type</th>
<th>Model No.</th>
<th>Spot type</th>
<th>Bar type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE marking directive compliance</td>
<td></td>
<td>EMC Directive, RoHS Directive</td>
<td></td>
</tr>
<tr>
<td>Effective charge removal width</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge removal time</td>
<td></td>
<td>50 mm 1.969 in approx.</td>
<td>60 mm 3.150 in approx.</td>
</tr>
<tr>
<td>Ion balance</td>
<td>±30 V or less (Note 2, 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge frequency</td>
<td></td>
<td>50 Hz / 20 Hz</td>
<td>50 Hz / 30 Hz / 20 Hz / 10 Hz / 5 Hz / 1 Hz</td>
</tr>
<tr>
<td>Discharge output voltage</td>
<td>±7,000 V approx.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ozone generation</td>
<td>0.01 ppm or less (Note 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum air pressure</td>
<td>0.5 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable fluid</td>
<td>Air (dried clean air) (Note 5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating altitude</td>
<td>2,000 m 6561.68 ft or less (Note 6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 to +50 °C / +32 to +122 °F (ER-X001: 0 to +40 °C / +32 to +104 °F) (No dew condensation allowed), Storage: -10 to +65 °C / +14 to +149 °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>35 to 65 % RH, Storage: 35 to 85 % RH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 to 55 Hz (ER-X001: 10 to 150 Hz) frequency, 0.75 mm 0.030 in double amplitude in X, Y and Z directions for two hours each</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>100 m/s² acceleration (10 G approx.), in X, Y and Z directions three times each</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enclosure grounding method</td>
<td>Floating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Main unit enclosure: PPS, Stainless steel (SUS), Head mounting bracket: Stainless steel (SUS), Discharge needle: PC, PPS, Tungsten</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of high-voltage cable</td>
<td>1.2 m 3.937 ft</td>
<td>0.5 m 1.640 ft</td>
<td>0.5 m 1.640 ft (Note 4)</td>
</tr>
<tr>
<td>Net weight</td>
<td>370 g approx.</td>
<td>330 g approx.</td>
<td>410 g approx.</td>
</tr>
<tr>
<td>Accessory</td>
<td>Head mounting bracket (mounted at the factory)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### High and low temperature resistant

<table>
<thead>
<tr>
<th>Type</th>
<th>Model No.</th>
<th>ER-X008HC</th>
<th>ER-X016HC</th>
<th>ER-X032HC</th>
<th>ER-X048HC</th>
<th>ER-X064HC</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE marking directive compliance</td>
<td></td>
<td>EMC Directive, RoHS Directive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective charge removal width</td>
<td>80 mm 3.150 in approx.</td>
<td>160 mm 6.299 in approx.</td>
<td>320 mm 12.598 in approx.</td>
<td>480 mm 18.898 in approx.</td>
<td>640 mm 25.197 in approx.</td>
<td></td>
</tr>
<tr>
<td>Charge removal time</td>
<td>1 sec. or less (Note 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ion balance</td>
<td>±30 V or less (Note 2, 3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge output voltage</td>
<td>±7,000 V approx.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ozone generation</td>
<td>0.01 ppm or less (Note 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum air pressure</td>
<td>0.1 MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable fluid</td>
<td>Air (dried clean air) (Note 5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Operating altitude</td>
<td>2,000 m 6561.68 ft or less (Note 6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Head: -60 to +200 °C / -76 to +392 °F (No dew condensation or icing allowed) (Note 9), Storage: -10 to +65 °C / +14 to +149 °F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>High voltage unit: 35 to 65 % RH, Storage: 35 to 85 % RH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 to 55 Hz (ER-X001: 10 to 150 Hz) frequency, 0.75 mm 0.030 in double amplitude in X, Y and Z directions for two hours each</td>
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</tr>
<tr>
<td>Enclosure grounding method</td>
<td>Floating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Main unit enclosure: PPS, Stainless steel (SUS), Head mounting bracket: Stainless steel (SUS), Discharge needle: PC, PPS, Tungsten, Main unit enclosure of high-voltage unit: ABS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of high-voltage cable</td>
<td>Heat-resistant shielded cable, 1.8 m 5.906 ft long</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net weight</td>
<td>420 g approx.</td>
<td>490 g approx.</td>
<td>620 g approx.</td>
<td>760 g approx.</td>
<td>900 g approx.</td>
<td></td>
</tr>
<tr>
<td>Accessories</td>
<td>ø6 ø0.236-4 air tube joint: 1 pc., Seal cap: 1 pc., Head mounting bracket (mounted at the factory)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Typical value in condition of discharge distance 50 mm 1.969 in, center of the product, discharge frequency 50 Hz and air supply 60 l/min (0.3 MPa).
2. Typical value in condition of discharge distance 100 mm 3.937 in (ER-X001: 50 mm 1.969 in), center of the product, discharge frequency 50 Hz (ER-X□HC: 30 Hz) and no air supply.
3. Ion balance refers to the average value of plus and minus. The specification value is the typical one in condition used when ambient temperature change is less than ±10 °C, ion balance is set after 30 minutes from the discharge start, the ion balance control function is set ON.
4. The high-voltage cable is also available in lengths of 1 m 3.281 ft and 2 m 6.562 ft. The discharge frequency of 1 m 3.281 ft / 2 m 6.562 ft cables is 50 / 30 / 20 / 10 / 5 / 1 Hz. For details, please contact our sales office.
5. The dried clean air is the air dried (dew point: equivalent of -20 °C) and filtered (mesh-size: equivalent of 0.01 μm).
6. Do not use or store in an environment that has been pressurized to an air pressure higher than the atmospheric pressure at 0 m.
7. Silicon needles (ER-X016S, ER-X032S and ER-XANS) are also available. For details, please contact our sales office.
8. Set the discharge frequency to 30 Hz. Do not use any other frequency.
9. Discoloration of the head may occur when used under high temperatures, but it does not affect the charge removal performance.
### SPECIFICATIONS

#### Allowable ambient temperature of high and low temperature resistant type head ER-X::HC and its installation

When installing, make sure to expose a section measuring 500 mm (19.685 in) or more to the normal temperature area as shown below for the protection of the high-voltage unit.

![Diagram showing the installation of ER-X::HC head](image)

Note: The high and low temperature resistant type ER-X::HC cannot be connected with the ER-XCCJ10H head connection cable (10 m (32.808 ft) in length).

#### Controller

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE marking directive compliance</td>
<td>ER-XC02</td>
<td></td>
</tr>
<tr>
<td>Number of heads connected</td>
<td>Maximum 2 units</td>
<td></td>
</tr>
<tr>
<td>Supply voltage</td>
<td>24 V DC ±10 %</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>450 mA or less when connecting 1 head, 800 mA or less when connecting 2 heads</td>
<td></td>
</tr>
</tbody>
</table>

#### Indicator

- **DSC (Discharge)**: Green LED (lights up when discharging)
- **CHECK**: Orange LED (lights up when dirt, wear, etc. of the discharge needle is detected)
- **ERROR**: Red LED (lights up when abnormal discharge is detected)
- **Level meter**: Green LED (5 levels, lights up depending on amount of the charge or ion generation)

#### Output

- **Output operation**
  - **ALARM**: ON when dirt or wear of the discharge needle is detected, OFF when operation is normal.
  - **ERROR**: OFF when abnormal discharge is detected, ON when operation is normal.
- **Output operation**
  - PhotoMOS relay output
  - Maximum load current: 100 mA
  - Applied voltage: 30 V DC or less (between output-output common)
  - Residual voltage: 1.5 V or less (at 100 mA load current)

#### Discharge control input (DSC OFF)

- Discharge allowed: Open, Discharge halt: 24 V or 0 V shorted

#### Contamination level

- 2

#### Elevation

- 2,000 m (6561.68 ft) or less (Note)

#### Ambient temperature

- 0 to +50 °C (32 to +122 °F) (No dew condensation allowed), Storage: −10 to +65 °C (−14 to +149 °F)

#### Ambient humidity

- 35 to 65 % RH, Storage: 35 to 85 % RH

#### Voltage withstandability

- 1,000 V AC for one min. between all supply terminals connected together and enclosure
- 500 V AC for on min. between supply terminals and F.G.

#### Insulation resistance

- 20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure

#### Vibration resistance

- 10 to 150 Hz frequency, 0.75 mm 0.030 in double amplitude in X, Y and Z directions for two hours each

#### Shock resistance

- 100 m/s² acceleration (10 G approx.) in X, Y and Z directions three times each

#### Enclosure grounding method

- Floating

#### Material

- Enclosure: ABS

#### Weight

- Net weight: 130 g approx.

#### Accessories

- Power supply / I/O connector: 1 set (Housing 5557-10R, Terminal 5556TL [manufactured by Molex])
- Ground wire (3.7 m 12.139 ft approx.): 1 pc.

Note: Do not use or store in an environment that has been pressurized to an air pressure higher than the atmospheric pressure at 0 m.
**CHARGE REMOVAL CHARACTERISTICS (TYPICAL)**

Please contact our office for details on data that is not listed here.

Measured using a 150 × 150 mm 5.906 × 5.906 in CPM (charge plate monitor). (At center of CPM)

### Common to ER-X001/X008

<table>
<thead>
<tr>
<th>Air flow</th>
<th>ER-X001</th>
<th>ER-X008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air flow [ℓ/min. (ANR)]</td>
<td>9.843</td>
<td>9.843</td>
</tr>
</tbody>
</table>

### ER-X001

- **Charge removal field**
  - (airless, 50 Hz)
  - (airless, 20 Hz)
  - (0.005 MPa, 50 Hz)
  - (0.005 MPa, 20 Hz)

### ER-X008

- **Charge removal field**
  - (vertical direction, airless, 50 Hz)
  - (vertical direction, airless, 10 Hz)
Measured using a 150 × 150 mm 5.906 × 5.906 in CPM (charge plate monitor). (At center of CPM)
Measured using a 150 × 150 mm 5.906 × 5.906 in CPM (charge plate monitor). (At center of CPM)
CHARGE REMOVAL CHARACTERISTICS (TYPICAL) Please contact our office for details on data that is not listed here.

Measured using a 150 × 150 mm 5.906 × 5.906 in CPM (charge plate monitor). (At center of CPM)

ER-X064

Charge removal field
(vertical direction, 0.5 MPa, 50 Hz)

Charge removal field
(vertical direction, 0.5 MPa, 10 Hz)

Charge removal field
(vertical direction, 0.5 MPa, 1 Hz)

Common to ER-X□HC

Air flow

Correlation between charge removal distance and charge removal time (30 Hz)

Please contact our office for details on data that is not listed here.
### I/O CIRCUIT AND WIRING DIAGRAMS

#### New-type controller (produced from April 2014 on)

Notice: Products manufactured from April 2014 and before April 2016 cannot be used with the high and low temperature resistant type head ER-X008HC. For the Identification of previous-type and new-type controllers and for the combination with the head, refer to p.16.

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Terminal name</th>
<th>Color code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 V</td>
<td>Blue</td>
</tr>
<tr>
<td>2</td>
<td>COM(–)</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>Discharge control input</td>
<td>Pink</td>
</tr>
<tr>
<td>4</td>
<td>COM(OUT)</td>
<td>Violet</td>
</tr>
<tr>
<td>5</td>
<td>F.G. terminal</td>
<td>Green / Yellow</td>
</tr>
<tr>
<td>6</td>
<td>24 V</td>
<td>Brown</td>
</tr>
<tr>
<td>7</td>
<td>COM(+)</td>
<td>–</td>
</tr>
<tr>
<td>8</td>
<td>COM(IN)</td>
<td>White</td>
</tr>
<tr>
<td>9</td>
<td>Alarm output</td>
<td>Orange</td>
</tr>
<tr>
<td>10</td>
<td>Error output</td>
<td>Black</td>
</tr>
</tbody>
</table>

Note: Color code refers to cable colors of an optional power supply cable.

When connecting the output to negative common

- Be sure to ground.
- Contact “closed” or transistor ON: Discharge halt
- Contact “open” or transistor OFF: Starting discharge

#### Previous-type controller (produced before March 2014)

Notice: Products manufactured before March 2014 cannot be used with ER-X001, ER-X008 and the high and low temperature resistant type head ER-X001HC.

For the Identification of previous-type and new-type controllers and for the combination with the head, refer to p.16.

<table>
<thead>
<tr>
<th>Terminal No.</th>
<th>Terminal name</th>
<th>Color code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 V</td>
<td>Blue</td>
</tr>
<tr>
<td>2</td>
<td>COM(–)</td>
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<td>10</td>
<td>Error output</td>
<td>Black</td>
</tr>
</tbody>
</table>

Note: Color code refers to cable colors of an optional power supply cable.

When connecting the output to negative common

- Be sure to ground.
- Contact “closed” or transistor ON: Discharge halt
- Contact “open” or transistor OFF: Starting discharge

Notes:
1. Be sure to ground the F.G. terminal. If F.G. terminal is not connected properly, it may cause electric shock.
2. To stop discharge, turn ON the discharge control input for 20 ms or longer. To start discharge, turn OFF (open) the discharge control input. Discharge will start in 20 ms.
PRECAUTIONS FOR PROPER USE

- Never use this product as device for personnel protection.
- In case of using devices for personnel protection, use products which meet laws or standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.
- This product produces high voltages.
- Do not use this product in places where there may be a danger of flammable or combustible items being present.
- To prevent electric shock and to conduct proper discharge, be sure to ground a frame ground (F.G.) terminal of a controller.
- Do not place hands near the discharge needle. Doing so may cause electric shock.
- Since the tip of the discharge needle is sharp, take sufficient care in handling the discharge needle, or injuries may result.
- The high-voltage cable between the head and the high-voltage unit must be fixed and the minimum bend radius is less than R30 mm R1.181 in. In case of using at the bend radius R30 mm R1.181 in or less and using at moving part may cause fire and break down, etc. of the high-voltage cable.
- Clean the discharge needle regularly (about once a week). Otherwise, optimum charge removal performance may not be achieved, and accidents or operating problems may occur.
- If this product is used in a confined space, ozone emitted from this product may be detrimental. Be sure to provide ventilation.
- Do not direct ionized air toward the face. Ozone may cause irritation to places such as the nose and throat.
- When the product has been used under very high or low temperatures, do not touch the product with a bare hand. Failure to observe this caution can result in burn or injury. Be sure to let the product cool sufficiently when touching the product for maintenance or other purposes.
- Do not touch the discharge needle with hard objects such as tools. If the discharge needle becomes broken, it will not provide sufficient charge. Be sure to use a soft cloth to clean the discharge needle.
- Do not direct ionized air toward the face. Ozone may cause irritation to places such as the nose and throat.
- Do not throw this product in fire. It may explode or toxic fumes may be generated.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Verify that the supply voltage variation is within the rating.
- In case using switching regulator, be sure to connect F.G. terminal.
- When connecting / removing the head or performing wiring or inspection work, be sure to turn off the power first. Not doing so may result in accidents, electric shock or operating problems.
- After connecting the cables, check that the connections are correct before turning on the power. If the cables are connected incorrectly, operating problems or accidents may occur.
- Do not use a cable with any damage such as cracks or splitting. Risk of accidents and failure.
- Avoid use in a location with significant steam or dust, or in a location where the product may come in direct contact with water, oil, or welding spatter.
- Do not touch the discharge needle with hard objects such as tools. If the discharge needle becomes broken, it will not provide sufficient charge removal performance, and moreover operating problems or accidents may occur.
- During installation, fasten the product securely. If it is not securely fastened or it is subjected to continuous vibration or shock, accidents or operating problems may result.
- Power cable that are 0.15mm² or more and 30 m 98.425 ft or less in total length for wiring. Also, keep the wiring as short as possible in order to prevent noise.
- When disposing of this product, treat it appropriately as industrial waste.
- After starting discharge, it takes 30 minutes approx. for charge removal performance to stabilize. Therefore, wait 30 minutes before adjusting ion balance.
- Use the correct combination of head, discharge needle unit and controller.

Identification of previous-type and new-type controllers and combination with the head

<table>
<thead>
<tr>
<th>New-type controller (Note)</th>
<th>Previous-type controller (Note)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Produced from April 2016 on</td>
<td>Produced from April 2014 and before April 2016</td>
</tr>
</tbody>
</table>

**Combination**

1. **Spot type**
   - ER-X001: OK
   - ER-X008: OK
   - ER-X016: OK
   - ER-X032: OK
   - ER-X048: OK
   - ER-X064: OK

2. **Bar type**
   - ER-X008HC: OK
   - ER-X016HC: OK
   - ER-X032HC: OK
   - ER-X048HC: OK
   - ER-X064HC: OK

**Note:** The layout of the power supply connector pins differ between new-type controllers and previous-type controllers. For details refer to ‘I/O CIRCUIT AND WIRING DIAGRAMS’ (p.15).
Mounting

Head installation

- Using two M4 screws or one M6 screw, mount the head onto the equipment housing.
- Loosen the angle adjustment screw, adjust the head angle, and then fasten the head with the tightening torque of 0.5 N·m or less.
- Position the head mounting bracket of the ER-X001 at least 20 mm 0.787 in away from the tip of the head. The tightening torque for the head fixing screw must be 0.5 N·m or less.
- After mounting and setting up the head, set the controller according to the procedures described in the instruction manual in order to properly remove electrical charge.

Notes:
1) Be sure to ground the equipment housing onto which the head is mounted.
2) The distance between the head and the charge removing object should be 30 mm 1.181 in or more.
   If the surface build-up of the charge removing object is 30 kV or more, set the distance to 50 mm 1.969 in or more.
3) If there is metal near the head or between the head and the charge removing object, ion is absorbed, hindering appropriate static removal. Install the head under the following installation condition.
4) In case using the side mounting, the discharge frequency should be 10 Hz or more.

5) When installing two or more heads set the same frequency and keep the distance as below. In face to face or parallel using different frequency, keep the distance between the heads 400 mm 15.748 in or more.
When installing the heads face to face, install heads in distance that the heads can perform the charge removal of a side of the object individually.
- Face-to-face installation
- Parallel installation

High-voltage unit installation

- Use two M4 screws or two M6 screws to fasten the head. The tightening torques for fastening, are as follows.
  - When using M4 screws: 1.2 N·m
  - When using M6 screws: 2.5 N·m

Notes:
1) Do not place any objects on top of the high-voltage unit.
2) When using multiple heads, keep the distance of at least 10 mm 0.394 in between the high-voltage units.
3) When fastening the high-voltage unit using M6 screws, fasten before connecting the head connection cable.
4) Use M6 screws for the installation of the high-voltage unit of the ER-X001.
5) The minimum bending radius of the high-voltage cable is R30 mm R1.181 in.

Controller installation

- Mount the controller on a 35 mm 1.378 in width DIN rail or using M4 screws.

<When mounting on a DIN rail>
- Pull the lock release lever to remove this product from the DIN rail.

<When mounting using M4 screws>
- The tightening torque should be 1.2 N·m or less.

Piping

- Air supplied to this product will reduce contamination of the discharge needle and improve the charge removal speed.
- The outer diameter of the air tube to fit to the air inlet portion of this product should be ø6 mm ø0.236 in.
- Make sure that clean air (air containing no water, no oil and no dust) should be supplied.
- Since the pressure will drop when the air piping from the main pressure supply is extended or pneumatic components (e.g., needle valve, speed controller, mini filter) are added, keep an eye on the pressure supply to the ionizer making sure it is not in short supply. For the pneumatic components, select those that can accommodate the air supply flow rate.

ER-X008/HX016/HX032/HX048/HX064
<Connection of pipe to head section>

ER-X008HC/HX016HC/HX032HC/HX048HC/HX064HC
<Connection of pipe to head section>

ER-X001
<Connection to high-voltage unit>

Note: After inserting the tube into the joint of this product, always make sure that the tube is all the way in and securely inserted. Insufficient tube insertion will cause air leakage.
Area Ionizer ER-X SERIES

**DIMENSIONS (Unit: mm in)**

The CAD data can be downloaded from our website.

**ER-X008/X016/X032/X048/X064**

- **Model No.**
  - ER-X008
  - ER-X016
  - ER-X032
  - ER-X048
  - ER-X064

- **Head**
  - Joint for ø6 ø0.236 air tube
  - Clean air outlet (4 points)
  - Points of discharge needle ion air outlet

**Mounting drawing with discharge part protective cover (ER-XACVR)**

- **Details of a head mounting bracket**
- **Mounting drawing with discharge part protective cover (ER-XACVR)**

**Note:** The ER-XACVR discharge part protective cover cannot be used on the ER-X008 or high and low temperature resistant type head ER-X□HC.

**ER-X008HC/X016HC/X032HC/X048HC/X064HC**

- **Head**
  - Joint for ø6 ø0.236 air tube (jointary)
  - Clean air outlet (4 points)

**Details of a head mounting bracket**

**Allowable ambient temperature:** -60 to +200 °C  -76 to +392 °F

**Model No.**
- ER-X008
- ER-X016
- ER-X032
- ER-X048
- ER-X064
- ER-X080HC
- ER-X16HC
- ER-X032HC
- ER-X048HC
- ER-X064HC
DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

ER-X001

Head connection cable

**Length L**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Length L</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER-XCCJ2H</td>
<td>2,000 78.74</td>
</tr>
<tr>
<td>ER-XCCJ5H</td>
<td>5,000 196.85</td>
</tr>
<tr>
<td>ER-XCCJ10H</td>
<td>10,000 393.70</td>
</tr>
</tbody>
</table>

ER-XC02

Controller

**Length L**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Length L</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER-XCC2</td>
<td>2,000 78.74</td>
</tr>
<tr>
<td>ER-XCC5</td>
<td>5,000 196.85</td>
</tr>
</tbody>
</table>

ER-XCC□

Power cable (Optional)

**Length L**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Length L</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER-XCC2</td>
<td>2,000 78.74</td>
</tr>
<tr>
<td>ER-XCC5</td>
<td>5,000 196.85</td>
</tr>
</tbody>
</table>

ER-XAPS(-EX)

AC adapter (Optional)

**Length L**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Length L</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER-XCC2</td>
<td>2,000 78.74</td>
</tr>
<tr>
<td>ER-XCC5</td>
<td>5,000 196.85</td>
</tr>
</tbody>
</table>

Note: The AC cable is not enclosed with ER-XAPS-EX.
Disclaimer

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