Static Electricity Elimination Equipment

Ionizer/Bar Type
IZS40/41/42

Ionizer/Nozzle Type
IZN10

Ionizer/Fan Type
IZF10

Electrostatic Sensor
IZD10/IZE11

Handheld Electrostatic Meter
IZH10

CAT.NE103A
Static Electricity
Elimination Equipment

- **Ionizer/Bar Type**
  - *Series IZS40/41/42*  
  → P.4

- **Ionizer/Nozzle Type**
  - *Series IZN10*  
  → P.32

- **Ionizer/Fan Type**
  - *Series IZF10*  
  → P.55

- **Electrostatic Sensor**
  - *Series IZD10/IZE11*  
  → P.58

- **Handheld Electrostatic Meter**
  - *Series IZH10*  
  → P.74
Potential amplitude: 25 V or less
Rapid elimination of static electricity: Fastest time: 0.1 seconds

Dual AC type Series IZS42
Potential amplitude is reduced with Dual AC type.

Feedback sensor type Series IZS41
Rapid elimination of static electricity by a feedback sensor

Standard type Series IZS40
Simple operation: Can be controlled by powering the ionizer ON.

Note 1) IZS42, Installation height: 300 mm
Note 2) Conditions/With feedback sensor
Charged voltage: 1000 V → 100 V
Discharged object: Charged plate (150 mm x 150 mm, capacitance 20 pF)
Installation distance: 200 mm (Tungsten electrode needle with air purge)
Series IZS40/41/42

**Dual AC type Series IZS42 (Potential amplitude reduction specification)**

Potential amplitude: 25 V or less 80% reduction compared to the conventional model
(Compared to the IZS31 series at the installation height of 300 mm)

Potential amplitude is reduced with SMC independent Dual AC type sensor.
Static electricity elimination may be achieved without causing damage to a device which is sensitive to electrostatic discharge (ESD).
Potential amplitude applied to the applicable workpiece is reduced even if it the workpiece is mounted within close proximity of the ionizer.

![Graph showing potential amplitude reduction](image)

**Independent Dual AC type is implemented.**

Dual AC type/IZS42

Discharges + ions and – ions at the same time to allow the + and – ions to reach the workpiece evenly, thereby reducing the potential amplitude.

![Image of ionizer and workpiece](image)

AC type

+ ion and – ion layers reach the workpiece within the same cycle, which increases the potential amplitude.

**Standard type Series IZS40**

Simple operation: Can be controlled by powering the ionizer ON.

Static electricity removal speed is improved with the use of the IZS40. At 1000 mm, the static electricity removal speed of the IZS40 is 3.2 s. This represents a 41% reduction in removal speed as compared to previously released models.

![Graph showing static electricity elimination time](image)

Static electricity elimination data when voltage is reduced from 1000 V to 100 V.
Conditions: Ion generation frequency 30 Hz Supply pressure: 15 psi (0.1 MPa)
The IZS40 has a high speed static electricity elimination cartridge.
Feedback sensor type Series IZS41 (High speed static electricity elimination specification)

Rapid elimination of static electricity by a feedback sensor

The speed of static electricity elimination has been increased by reading the workpiece's electrostatic potential by the feedback sensor (option) and continuously emitting ions with a reverse polarity.

Run mode after static electricity elimination (ion balance: within ±30 V) can be selected.

- **Energy saving run mode** Stops generating ions after static electricity elimination to reduce power consumption.
- **Continuous static electricity elimination run mode** After static electricity elimination, the ionizer changes to AC mode. Continues to eliminate static electricity to make it approach 0 V even if the ion balance is within ±30 V.

Continuous static electricity elimination run mode

- Generates ions of opposite polarity outside of the ±30 V range.
- Stops generating ions after static electricity elimination to reduce power consumption.
- Prevents adhesion of dust.
- Prevents breakage due to adhesion and discharge.
- Prevents element disruption due to discharge.

Supply pressure: 15 psi (0.1 MPa) Operation frequency: 30 Hz
Electrode cartridge with rapid elimination of static electricity (8.6 L/min [ANR] Cartridge)
Installation height of sensor: 25 mm

- Prevents adhesion of dust.
- Prevents breakage due to adhesion and discharge.
- Improves detachability of molded goods from a die.

![Image of Rapid Elimination of Static Electricity by a Feedback Sensor](image)

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**Note**: An ion balance sensor is installed.

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**AC adapter power supply is available.**

**e-con connector is used.**
Reduction of adjustment and maintenance labor by auto balance sensor

Built-in type (Standard)
The sensor is installed within the ionizer body and may be mounted anywhere. Monitoring the amount of ion emitted from an ionizer, the auto balance sensor maintains the initial ion balance by adjusting the +/- ion supply rate.

Ion balance (image)

High accuracy type (Option)
- The ion balance near the workpiece is accurately adjusted.
- The object is not affected by the height of installation or any disturbance interference.

Auto balance sensor
Measures the ion balance condition.

Low maintenance electrode cartridges are used.
- Minimizes contamination of electrode needles by discharging compressed air at the surface of the needles.
- 2 types of electrode needle materials
  - Tungsten: Ion balance ±30 v
  - Single crystal silicon: Ion balance ±30 v, suitable for eliminating static electricity of silicon wafer

Air covers the electrode needle.

<table>
<thead>
<tr>
<th>Electrode needle materials</th>
<th>IZS40/41/42 Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten (Cartridge color: White)</td>
<td>IZS41, IZS42</td>
</tr>
<tr>
<td>Silicon (Cartridge color: Gray)</td>
<td>IZS41, IZS42</td>
</tr>
</tbody>
</table>
Setting ionizer with remote controller

- May be used to adjust and set several ionizers remotely.
- Can recognize and control up to 16 ionizers through address setting.
- Frequency setting
- Ion balance adjustment
- Electrode contamination detection alarm level can be adjusted (3 levels).
- Built-in sensor valid/invalid may be selected.

Transition wiring may be used.

Total number of ionizers that may be connected IZS41: Max. 8 units. IZS42: Max. 5 units.

<Conditions> Bar length 340 to 2500 mm, Power supply cable 3 m, Transition wiring cable 2 m

Reduces man hours required for connecting wires to the power supply.

Safety functions

- Electrode cartridge drop prevention function
  Locking by double-action

- Drop prevention cover
  Can even more reliably prevent electrode cartridges from dropping off.

High speed static electricity elimination cartridges and energy saving static electricity elimination cartridges are available.

High speed de-ionizing cartridge

Energy saving type de-ionizing cartridge

The flow rate consumption of the energy-saving static electricity elimination cartridge is approximately 50% less than that of the high speed static electricity elimination cartridge.

The static electricity elimination speed is reduced by approximately 20 to 30%.

Elimination of static electricity with reduced air consumption through the use of one pneumatic nozzle.
# Ionizer Series IZS40/41/42

## Models and Functions

<table>
<thead>
<tr>
<th>Method of applying voltage</th>
<th>IZS42</th>
<th>IZS41</th>
<th>IZS40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual AC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC, Sensing AC, DC</td>
<td>✔</td>
<td>✔</td>
<td>—</td>
</tr>
<tr>
<td>AC, DC</td>
<td>—</td>
<td>—</td>
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<tr>
<th>Sensor (Auto balance)</th>
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<tr>
<td>Built-in type (Standard)</td>
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<td>✔</td>
<td>—</td>
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<tr>
<td>High accuracy type (Option)</td>
<td>✔</td>
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<td>—</td>
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<table>
<thead>
<tr>
<th>Feedback sensor (Option)</th>
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<th></th>
<th></th>
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<tr>
<td></td>
<td>—</td>
<td>✔</td>
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<table>
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<tr>
<th>I/O</th>
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<table>
<thead>
<tr>
<th>Transition wiring may be used, Note 1)</th>
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<tr>
<td></td>
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<td>✔</td>
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<table>
<thead>
<tr>
<th>Incorrect high voltage ion discharge detection</th>
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<table>
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<th>Low maintenance electrode</th>
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<table>
<thead>
<tr>
<th>Cartridge</th>
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<tbody>
<tr>
<td>Energy saving type de-ionizing</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>High speed de-ionizing</td>
<td>✔</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>With One-touch fitting (ø6, ø8, ø10)</th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
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<table>
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<th>Bracket mount</th>
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<table>
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<tr>
<th>Non-standard bar length (Made to Order)</th>
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<td></td>
<td>✔</td>
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</table>

### Accessories sold separately (per series)

<table>
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<th>Series</th>
<th>IZS42</th>
<th>IZS41</th>
<th>IZS40</th>
</tr>
</thead>
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<tr>
<td>Remote controller</td>
<td>✔</td>
<td>✔</td>
<td>—</td>
</tr>
<tr>
<td>AC adapter</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Drop prevention cover</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Electrode needle cleaning kit</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

Note 1) Order transition wiring separately.
Application Examples

Eliminating static electricity from films
- Prevents adhesion of dust.
- Prevents winding failure due to wrinkles etc.

Eliminating static electricity on film molded goods
- Prevents attaching to conveyor.
- Prevents dispersion of finished goods.

Eliminating static electricity during wafer transfer
- Prevents breakage due to discharge between wafers and hands.

Eliminating static electricity from packing films
- Prevents the filled substance from adhering to the packing film.
- Reduces packing mistakes.

Eliminating static electricity from lens
- Removes dust from lens.
- Prevents adhesion of dust.

Eliminating static electricity from parts feeder
- Prevents clogging of parts feeder.
Series IZS40/41/42
Technical Data

Static Electricity Elimination Characteristics

1) Installation Distance and De-ionization Time (Electricity Elimination from 1000 V to 100 V)

IZS40, 41

1) Without air purge

Supply pressure: 15 psi (0.1 MPa) (0.30 scfm (8.6 L/min [ANR]) per cartridge)

Supply pressure: 44 psi (0.3 MPa) (0.62 scfm (17.6 L/min [ANR]) per cartridge)

Supply pressure: 73 psi (0.5 MPa) (0.93 scfm (26.4 L/min [ANR]) per cartridge)

2) With high speed de-ionizing cartridge, With air purge

Supply pressure: 15 psi (0.1 MPa) (0.15 scfm (4.3 L/min [ANR]) per cartridge)

Supply pressure: 44 psi (0.3 MPa) (0.30 scfm (8.6 L/min [ANR]) per cartridge)

Supply pressure: 73 psi (0.5 MPa) (0.47 scfm (13.3 L/min [ANR]) per cartridge)

3) With energy saving type de-ionizing cartridge, With air purge

Supply pressure: 15 psi (0.1 MPa) (0.15 scfm (4.3 L/min [ANR]) per cartridge)

Supply pressure: 44 psi (0.3 MPa) (0.30 scfm (8.6 L/min [ANR]) per cartridge)

Supply pressure: 73 psi (0.5 MPa) (0.47 scfm (13.3 L/min [ANR]) per cartridge)

Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material and/or size of a subject.
IZS42

1) Without air purge

![Graph showing static electricity elimination time vs installation distance for 1 Hz and 30 Hz]

2) With high speed de-ionizing cartridge, With air purge

Supply pressure: 15 psi (0.1 MPa) 0.30 scfm (8.6 L/min [ANR] per cartridge)

![Graph showing static electricity elimination time vs installation distance for 1 Hz and 30 Hz]

Supply pressure: 44 psi (0.3 MPa) 0.62 scfm (17.6 L/min [ANR] per cartridge)

![Graph showing static electricity elimination time vs installation distance for 1 Hz and 30 Hz]

Supply pressure: 73 psi (0.5 MPa) 0.93 scfm (26.4 L/min [ANR] per cartridge)

3) With energy saving type de-ionizing cartridge, With air purge

Supply pressure: 15 psi (0.1 MPa) 0.15 scfm (4.3 L/min [ANR] per cartridge)

![Graph showing static electricity elimination time vs installation distance for 1 Hz and 30 Hz]

Supply pressure: 44 psi (0.3 MPa) 0.30 scfm (8.6 L/min [ANR] per cartridge)

![Graph showing static electricity elimination time vs installation distance for 1 Hz and 30 Hz]

Supply pressure: 73 psi (0.5 MPa) 0.47 scfm (13.3 L/min [ANR] per cartridge)

![Graph showing static electricity elimination time vs installation distance for 1 Hz and 30 Hz]
IZS40/41/42

Static Electricity
Elimination Characteristics

Static Electricity Elimination Range

IZS40, 41

Frequency: 30 Hz

1) Supply pressure: 0 psi (0 MPa)

![Graph 1](image1)

2) With high speed de-ionizing cartridge, Supply pressure: 44 psi (0.3 MPa)

![Graph 2](image2)

3) With energy saving type de-ionizing cartridge, Supply pressure: 44 psi (0.3 MPa)

![Graph 3](image3)

Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material and/or size of a subject.
IZS42
Frequency: 30 Hz

1) Supply pressure: 0 psi (0 MPa)

2) With high speed de-ionizing cartridge, Supply pressure: 44 psi (0.3 MPa)

3) With energy saving type de-ionizing cartridge, Supply pressure: 44 psi (0.3 MPa)
IZS40, 41
Supply pressure: 44 psi (0.3 MPa), Frequency: 30 Hz
With high speed de-ionizing cartridge

IZS42
Supply pressure: 0.3 MPa, Frequency: 30 Hz
With high speed de-ionizing cartridge

With energy saving type de-ionizing cartridge

Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material and/or size of a subject.
**Flow Rate — Pressure Characteristics**

- **With high speed de-ionizing cartridge**
  - Pressure vs. Flow rate graph
  - *With energy saving type de-ionizing cartridge* — Pressure vs. Flow rate graph

**How to measure**

- **a) Single side air supply (Connecting tube: O.D. ø6 x I.D. ø4)**
  - (IZS40/4, 400, 460, 580, 640)
- **b) Both sides air supply (Connecting tube: O.D. ø6 x I.D. ø4)**
  - (IZS40/340-820, 1120, 1300)
- **c) Both sides air supply (Connecting tube: O.D. ø8 x I.D. ø5)**
  - (IZS40/4-1600, 1900, 2320, 2500)

**Feedback Sensor Detection Range**

The relationship between the feedback sensor’s installation distance and the detection range is as follows:

<table>
<thead>
<tr>
<th>Installation distance</th>
<th>Detection range</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>50</td>
<td>180</td>
</tr>
</tbody>
</table>
**Ionizer Series IZS40/41/42**

**How to Order**

**Type 40**

IZS 40 - 1600 - 10 B - X10

**Type 41/42**

IZS 42 - 1600 - 10 B - X10

**Specifications**

- **Bar type**
  - Type 41: Feedback sensor type
  - Type 42: Dual AC type

- **Electrode cartridge type/Electrode needle material**
  - Symbol: Nil, C, J, K
  - Electrode cartridge type: High speed de-ionizing cartridge, Energy saving type de-ionizing cartridge
  - Electrode needle material: Tungsten, Silicon

- **Input/Output specifications**
  - Symbol: Nil, P, NPN, PNP
  - When only an e-con connector for the IZS40 is required, specify "N", and order a part (Model: ZS-28-C) separately.
  - To use AC adapter, specify "N", and select AC adapter sold separately (on page 20).

- **Power supply cable**
  - Symbol: Nil, Z, N
  - With power supply cable (3 m), (10 m)
  - Without power supply cable

- **Made to Order**
  - Symbol: Sensor
    - Nil, Built-in sensor, F, Feedback sensor, G, Auto balance sensor [High accuracy type]
  - Feedback sensor cannot be used for the IZS42.

- **Bracket**
  - Symbol: Nil, B
  - Without bracket, With bracket
  - * The number of intermediate brackets differ depending on the bar length. (Refer to the below table.)

- **One-touch fitting**
  - Symbol: 06, 08, 10
  - ø6 One-touch fitting, ø8 One-touch fitting, ø10 One-touch fitting
  - Refer to the table below for selection of One-touch fittings.

- **Recommended piping port size**
  - Symbol: 06, 08, 10
  - ø6 One-touch fitting, ø8 One-touch fitting, ø10 One-touch fitting
  - Refer to the table below for selection of One-touch fittings.

- **Number of brackets**
  - Symbol:
    - Bar length symbol: 340 to 760, 820 to 1600, 1660 to 2380, 2440 to 2500
    - End bracket: With 2 pcs.
    - Intermediate bracket: None, With 1 pc., With 2 pcs., With 3 pcs.

- **How to Order**
  - Symbol: -X10, -X14
  - Non-standard bar length, Symbol for producible bar length: 460 + 60 x n (n: Integer from 1 to 34)
  - (For 2, 3, 6, 11, 14, 19, 24, 31 and 34 for n, use a standard model.)

- **Ordering example**
  - IZS 40 - 1600 - 10 B - X10
  - IZS 42 - 1600 - 10 B - X10

**Made to Order**

- Symbol: -X10
  - Contents: Non-standard bar length
  - Specifications: Symbol for producible bar length: 460 + 60 x n (n: Integer from 1 to 34)
  - (For 2, 3, 6, 11, 14, 19, 24, 31 and 34 for n, use a standard model.)

- Symbol: -X14
  - Contents: Model with electrode cartridge drop prevention cover
  - Specifications: The main unit is shipped fitted with an electrode cartridge drop prevention cover available as an option.
Specifications

<table>
<thead>
<tr>
<th>Ionizer model</th>
<th>IZS40</th>
<th>IZS41 (NPN)</th>
<th>IZS41-P (PNP)</th>
<th>IZS42 (NPN)</th>
<th>IZS42-P (PNP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ion generation method</td>
<td>Corona discharge type</td>
<td>Corona discharge type</td>
<td>Corona discharge type</td>
<td>Corona discharge type</td>
<td>Corona discharge type</td>
</tr>
<tr>
<td>Method of applying voltage</td>
<td>AC, DC</td>
<td>AC, Sensitive AC, DC</td>
<td>AC, Sensitive AC, DC</td>
<td>AC, Sensitive AC, DC</td>
<td>AC, Sensitive AC, DC</td>
</tr>
<tr>
<td>Applied voltage</td>
<td>±7,000 V</td>
<td>±7,000 V</td>
<td>±5,000 V</td>
<td>±6,000 V</td>
<td>±6,000 V</td>
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<tr>
<td>Ion balance</td>
<td>±30 V</td>
<td>±30 V</td>
<td>±30 V</td>
<td>±30 V</td>
<td>±30 V</td>
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<tr>
<td>Air purge</td>
<td>Fluid</td>
<td>Air (Clean dry air)</td>
<td>Air (Clean dry air)</td>
<td>Air (Clean dry air)</td>
<td>Air (Clean dry air)</td>
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<tr>
<td>Operating pressure</td>
<td>73 psi (0.5 MPa) or less</td>
<td>73 psi (0.5 MPa) or less</td>
<td>73 psi (0.5 MPa) or less</td>
<td>73 psi (0.5 MPa) or less</td>
<td>73 psi (0.5 MPa) or less</td>
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<td>101 psi (0.7 MPa)</td>
<td>101 psi (0.7 MPa)</td>
<td>101 psi (0.7 MPa)</td>
<td>101 psi (0.7 MPa)</td>
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<tr>
<td>Connecting tube O.D.</td>
<td>φ6, φ8, φ10</td>
<td>φ6, φ8, φ10</td>
<td>φ6, φ8, φ10</td>
<td>φ6, φ8, φ10</td>
<td>φ6, φ8, φ10</td>
</tr>
<tr>
<td>Current consumption</td>
<td>330 mA or less</td>
<td>440 mA or less</td>
<td>700 mA or less</td>
<td>440 mA or less</td>
<td>700 mA or less</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>24 VDC ±10% (100 to 240 VAC, AC adapter option)</td>
<td>24 VDC ±10% (100 to 240 VAC, AC adapter option)</td>
<td>24 VDC ±10% (100 to 240 VAC, AC adapter option)</td>
<td>24 VDC ±10% (100 to 240 VAC, AC adapter option)</td>
<td>24 VDC ±10% (100 to 240 VAC, AC adapter option)</td>
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<tr>
<td>Power supply voltage in a transition wiring</td>
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<td>—</td>
<td>—</td>
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<tr>
<td>Input signal</td>
<td>Discharge stop signal</td>
<td>—</td>
<td>Connected to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less</td>
<td>Connected to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less</td>
<td>Connected to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less</td>
</tr>
<tr>
<td>Electrode contamination detection signal</td>
<td>—</td>
<td>—</td>
<td>Connected to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less</td>
<td>Connected to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less</td>
<td>Connected to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less</td>
</tr>
<tr>
<td>Output signal</td>
<td>Maintenance signal</td>
<td>—</td>
<td>Max. load current: 100 mA Residual voltage 1 V or less (Load current at 100 mA) Max. applied voltage: 26.4 V</td>
<td>Max. load current: 100 mA Residual voltage 1 V or less (Load current at 100 mA) Max. applied voltage: 26.4 V</td>
<td>Max. load current: 100 mA Residual voltage 1 V or less (Load current at 100 mA) Max. applied voltage: 26.4 V</td>
</tr>
<tr>
<td>Error signal</td>
<td>Incorrect high voltage ion discharge detection (Ion discharge stops during detection)</td>
<td>Ion balance control with the built-in sensor, electrode contamination detection, incorrect high voltage ion discharge detection (stops discharge during detection), ion discharge stop input, transition wiring, remote controller (sold separately), external sensor connection</td>
<td>Ion balance control with the built-in sensor, electrode contamination detection, incorrect high voltage ion discharge detection (stops discharge during detection), ion discharge stop input, transition wiring, remote controller (sold separately), external sensor connection</td>
<td>Ion balance control with the built-in sensor, electrode contamination detection, incorrect high voltage ion discharge detection (stops discharge during detection), ion discharge stop input, transition wiring, remote controller (sold separately), external sensor connection</td>
<td>Ion balance control with the built-in sensor, electrode contamination detection, incorrect high voltage ion discharge detection (stops discharge during detection), ion discharge stop input, transition wiring, remote controller (sold separately), external sensor connection</td>
</tr>
<tr>
<td>Effective de-ionizing distance</td>
<td>50 to 2000 mm (Sensing AC mode: 200 to 2000 mm, Manual run/Automatic run: 100 to 2000 mm)</td>
<td>50 to 2000 mm</td>
<td>50 to 2000 mm (Sensing AC mode: 200 to 2000 mm, Manual run/Automatic run: 100 to 2000 mm)</td>
<td>50 to 2000 mm (Sensing AC mode: 200 to 2000 mm, Manual run/Automatic run: 100 to 2000 mm)</td>
<td>50 to 2000 mm (Sensing AC mode: 200 to 2000 mm, Manual run/Automatic run: 100 to 2000 mm)</td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>32 to 104°F (0 to 40°C)</td>
<td>32 to 104°F (0 to 40°C)</td>
<td>32 to 104°F (0 to 40°C)</td>
<td>32 to 104°F (0 to 40°C)</td>
<td>32 to 104°F (0 to 40°C)</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>35 to 80% RH (with no condensation)</td>
<td>35 to 80% RH (with no condensation)</td>
<td>35 to 80% RH (with no condensation)</td>
<td>35 to 80% RH (with no condensation)</td>
<td>35 to 80% RH (with no condensation)</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>100 m/s²</td>
<td>100 m/s²</td>
<td>100 m/s²</td>
<td>100 m/s²</td>
<td>100 m/s²</td>
</tr>
</tbody>
</table>

Note) When the air purge is performed between a charged object and an ionizer at a distance of 200 mm.

Number of electrode cartridges/Bar weight

<table>
<thead>
<tr>
<th>Bar length symbol</th>
<th>340</th>
<th>400</th>
<th>460</th>
<th>580</th>
<th>640</th>
<th>820</th>
<th>1120</th>
<th>1300</th>
<th>1600</th>
<th>1900</th>
<th>2320</th>
<th>2500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of electrode cartridges</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>13</td>
<td>18</td>
<td>21</td>
<td>26</td>
<td>31</td>
<td>38</td>
<td>41</td>
</tr>
<tr>
<td>Weight (g)</td>
<td>IZS40</td>
<td>590</td>
<td>640</td>
<td>690</td>
<td>790</td>
<td>830</td>
<td>980</td>
<td>1220</td>
<td>1360</td>
<td>1600</td>
<td>1840</td>
<td>2170</td>
</tr>
<tr>
<td>IZS41</td>
<td>740</td>
<td>790</td>
<td>840</td>
<td>940</td>
<td>980</td>
<td>1130</td>
<td>1370</td>
<td>1510</td>
<td>1750</td>
<td>1990</td>
<td>2230</td>
<td>2470</td>
</tr>
<tr>
<td>IZS42</td>
<td>860</td>
<td>910</td>
<td>960</td>
<td>1060</td>
<td>1100</td>
<td>1250</td>
<td>1490</td>
<td>1630</td>
<td>1870</td>
<td>2110</td>
<td>2440</td>
<td>2590</td>
</tr>
</tbody>
</table>

External sensor

<table>
<thead>
<tr>
<th>Sensor model</th>
<th>IZS31-DF (Feedback sensor)</th>
<th>IZS31-DG (Auto balance sensor/High accuracy type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>32 to 122°F (0 to 50°C)</td>
<td>32 to 122°F (0 to 50°C)</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>35 to 80% RH (with no condensation)</td>
<td>35 to 80% RH (with no condensation)</td>
</tr>
<tr>
<td>Case material</td>
<td>ABS</td>
<td>ABS, Stainless steel</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>100 m/s²</td>
<td>100 m/s²</td>
</tr>
<tr>
<td>Weight</td>
<td>200 g (including cable weight)</td>
<td>220 g (including cable weight)</td>
</tr>
<tr>
<td>Installation distance</td>
<td>10 to 50 mm (Recommended)</td>
<td>—</td>
</tr>
<tr>
<td>Standards/Directive</td>
<td>CE, UL, CSA</td>
<td>CE, UL, CSA</td>
</tr>
</tbody>
</table>

AC adapter (Sold separately)

<table>
<thead>
<tr>
<th>Model</th>
<th>IZF10-CG, IZS41-CG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>100 VAC to 240 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>Output current</td>
<td>1 A</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>32 to 104°F (0 to 40°C)</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>35 to 65% RH (with no condensation)</td>
</tr>
<tr>
<td>Weight</td>
<td>220 g</td>
</tr>
<tr>
<td>Standards/Directive</td>
<td>CE, UL, CSA</td>
</tr>
</tbody>
</table>

Remote controller (Sold separately)

<table>
<thead>
<tr>
<th>Model</th>
<th>IZS41-RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Infrared ray type</td>
</tr>
<tr>
<td>Transmission capacity</td>
<td>5 m (Note 1)</td>
</tr>
<tr>
<td>Power supply</td>
<td>2 AAA sized batteries (sold separately)</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>32 to 113°F (0 to 45°C)</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>35 to 80% RH (with no condensation)</td>
</tr>
<tr>
<td>Weight</td>
<td>33 g (excluding dry cell batteries)</td>
</tr>
<tr>
<td>Standards/Directive</td>
<td>CE</td>
</tr>
</tbody>
</table>

Note 1) Varies depending on the operating conditions and environment.
Note 2) Batteries are not supplied.
Note 3) Refer to the operation manual for handling of the remote controller.

Construction

Series IZS40

Series IZS41/42

1. Ionizer
2. Electrode cartridge
3. One-touch fitting
4. End bracket
5. Intermediate bracket
6. Feedback sensor
7. Auto balance sensor (High accuracy type)
8. Power supply cable (for IZS40)
9. Power supply cable (for IZS41/42)
Series IZS40/41/42

Accessories (for Individual Parts)

Feedback sensor
IZS31-DF

Auto balance sensor [High accuracy type]
IZS31-DG

Power supply cable
- IZS40-CP (3 m)
- IZS40-CPZ (10 m)
- IZS41-CP (3 m)
- IZS41-CPZ (10 m)

End bracket/IZS40-BE
Intermediate bracket/IZS40-BM

High speed de-ionizing cartridge
- IZS40-NT (Material: Tungsten)
- IZS40-NC (Material: Silicon)

Energy saving type de-ionizing cartridge
- IZS40-NJ (Material: Tungsten)
- IZS40-NK (Material: Silicon)

Made to Order

<table>
<thead>
<tr>
<th>Type</th>
<th>How to Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>IZS</td>
<td>- CP - X13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Cable full length</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1 m</td>
</tr>
<tr>
<td>02</td>
<td>2 m</td>
</tr>
</tbody>
</table>

Model with made-to-order power supply cable
Available in 1 m increments from 1 m to 20 m.
Note 1) 10 m or longer power cables are not CE Marking-compliant.
Note 2) Use standard power supply cables for 3 m and 10 m lengths.

<table>
<thead>
<tr>
<th>Bar length symbol</th>
<th>End bracket</th>
<th>Intermediate bracket</th>
</tr>
</thead>
<tbody>
<tr>
<td>340 to 760</td>
<td>With 2 pcs.</td>
<td>None</td>
</tr>
<tr>
<td>820 to 1600</td>
<td>With 1 pc.</td>
<td>With 2 pcs.</td>
</tr>
<tr>
<td>1660 to 2380</td>
<td>With 2 pcs.</td>
<td>With 3 pcs.</td>
</tr>
<tr>
<td>2440 to 2500</td>
<td>With 3 pcs.</td>
<td></td>
</tr>
</tbody>
</table>

Note) The number of intermediate brackets required, as listed below, depends on the bar length. Two end brackets are always required regardless of the bar length.

Note) Ionizer mounting screws attached, M4 x 8, 2 pcs.
Sold Separately

Electrode cartridge drop prevention cover

IZS40 - E 3

- Number of fixed electrode cartridges

<table>
<thead>
<tr>
<th></th>
<th>IZS40-E3</th>
<th>IZS40-E4</th>
<th>IZS40-E5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of fixed electrode cartridges</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

- Number of required drop prevention covers

<table>
<thead>
<tr>
<th>Bar length symbol</th>
<th>IZS40-E3</th>
<th>IZS40-E4</th>
<th>IZS40-E5</th>
</tr>
</thead>
<tbody>
<tr>
<td>340</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>400</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>460</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>580</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>640</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>820</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>1220</td>
<td>1</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>1300</td>
<td>2</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>1600</td>
<td>2</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>1900</td>
<td>2</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>2320</td>
<td>1</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>2500</td>
<td>2</td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>

The model number requires the suffix “-X14” to indicate that the body is to be shipped fitted with an electrode cartridge drop prevention cover.

Standard model no. - X14

Remote controller/IZS41-RC

AC adapter

For IZS40

IZF10 - C

- AC adapter

<table>
<thead>
<tr>
<th></th>
<th>G1 AC adapter + AC cord</th>
<th>G2 AC adapter (without AC cord)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC adapter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For IZS41/42

IZS41 - C

- AC adapter

<table>
<thead>
<tr>
<th></th>
<th>G1 AC adapter + AC cord</th>
<th>G2 AC adapter (without AC cord)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC adapter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AC cord is only for use in Japan. (Rated voltage 125 V, plug JIS C8303, inlet IEC60320-C8) External input and output cannot be used when the AC adapter is being used.

Transition wiring cable

IZS41 - CF

- Transition wiring cable

<table>
<thead>
<tr>
<th></th>
<th>02 Full length 2 m</th>
<th>05 Full length 5 m</th>
<th>08 Full length 8 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transition wiring cable length

Made to Order

How to Order

IZS41 - CF - X13

- Transition wiring cable length

<table>
<thead>
<tr>
<th></th>
<th>01 Cable full length</th>
<th>03 3 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model with Made-to-order transition wiring cable

Available in 1 m increments from 1 m to 20 m.

Note 1) 10 m or longer power cables are not CE Marking-compliant.

Note 2) Use standard power supply cables for 2 m, 5 m and 8 m lengths.

Note 3) Transition wiring is not possible for the IZS40.

Electrode needle cleaning kit/IZS30-M2

Mounted part of electrode cartridge

When attached to the body

AC adapter + AC cord

AC adapter (without AC cord)

For IZS40

IZF10 - C

For IZS41/42

IZS41 - C

AC cord is only for use in Japan. (Rated voltage 125 V, plug JIS C8303, inlet IEC60320-C8) External input and output cannot be used when the AC adapter is being used.

Made to Order

How to Order

IZS41 - CF - X13

- Transition wiring cable length

<table>
<thead>
<tr>
<th></th>
<th>19 19 m</th>
<th>20 20 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model with Made-to-order transition wiring cable

Available in 1 m increments from 1 m to 20 m.

Note 1) 10 m or longer power cables are not CE Marking-compliant.

Note 2) Use standard power supply cables for 2 m, 5 m and 8 m lengths.

Note 3) Transition wiring is not possible for the IZS40.
Wiring/IZS40

1. Grounding of F.G. cable

Make sure to ground the F.G. cable (green) with a resistance of 100 Ω or less. The F.G. cable is used as a reference electric potential for de-ionization. If the ground terminal F.G. is not properly grounded, the ionizer will not achieve the optimal ion balance. Therefore, please connect the ground terminal using a resistance of 100 Ω or less.

2. Connection circuit ("POWER" connector)

Wiring of the IZS40

e-con is adopted for the connector of the IZS40. Connector with cable or without cable may be selected when placing an order for the power supply cable. When only an e-con is required, place an order for it as a part. (Cable is not supplied.)

How to connect the cable of the connector

1) Cut the cable as shown in the figure to the below. Refer to the following table for the applicable wire size.

2) Insert the cable which was cut into the back of the connector.

3) Confirm that the cable is inserted into the back of the connector and press part A with your finger to hold tentatively.

4) Use a tool such as pliers to firmly tighten the center of Part A.

5) The connector cannot be reused once crimped. If cable insertion fails, use a new connector.

Connection Circuit/IZS40

If cables are prepared by the user, the cable colors shown in the diagram may change according to the cable colors by the user.
### Wiring

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Cable color</th>
<th>Description</th>
<th>Signal direction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Brown</td>
<td>24 VDC</td>
<td>IN</td>
<td>Power supply is connected to operate the ionizer.</td>
</tr>
<tr>
<td>B1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>Blue</td>
<td>GND</td>
<td>IN</td>
<td>Make sure to ground with a resistance of 100 Ω or less to use it as a reference electric potential for ionizer.</td>
</tr>
<tr>
<td>B2</td>
<td></td>
<td>F.G.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>Green</td>
<td></td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>B3</td>
<td>Light green</td>
<td>Discharge stop signal</td>
<td>IN</td>
<td>Signal input to turn ON/OFF the ion discharge. NPN specification: Stops ion discharge by connecting to GND. (Starts discharging ion when disconnected.) PNP specification: Stops ion discharge by connecting to + 24 VDC. (Starts discharging ion when disconnected.)</td>
</tr>
<tr>
<td>A4</td>
<td>Gray</td>
<td>Electrode contamination detection signal</td>
<td>IN</td>
<td>Input signal when determining the necessity of electrode needle maintenance.</td>
</tr>
<tr>
<td>B4</td>
<td>Yellow</td>
<td>Maintenance signal</td>
<td>OUT(Contact point A)</td>
<td>Turns ON when electrode needs cleaning.</td>
</tr>
<tr>
<td>A5</td>
<td>Purple</td>
<td>Error signal</td>
<td>OUT(Contact point B)</td>
<td>Turns OFF when power supply failure, ion discharge error, connected sensor failure, or CPU operation failure. (ON when there is no problem.)</td>
</tr>
<tr>
<td>B5</td>
<td>White</td>
<td>Unused</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>
**Ionizer Series IZS40/41/42**

### Dimensions

**Ionizer/IZS40**

![Diagram of Ionizer/IZS40]

- Applicable tube O.D.: A
  - 06: 13
  - 08: 15
  - 10: 22

**Part no.**  | **n** | **L (mm)**
--- | --- | ---
IZS40-340 | 5 | 340
IZS40-400 | 6 | 400
IZS40-460 | 7 | 460
IZS40-580 | 9 | 580
IZS40-640 | 10 | 640
IZS40-820 | 13 | 820
IZS40-1120 | 18 | 1120
IZS40-1300 | 21 | 1300
IZS40-1600 | 26 | 1600
IZS40-1900 | 31 | 1900
IZS40-2320 | 38 | 2320
IZS40-2500 | 41 | 2500

**End bracket/IZS40-BE**

![Diagram of End bracket/IZS40-BE]

**Intermediate bracket/IZS40-BM**

![Diagram of Intermediate bracket/IZS40-BM]
Series **IZS40/41/42**

**Dimensions**

**Ionizer/IZS41, 42**

<table>
<thead>
<tr>
<th>Applicable tube O.D.</th>
<th>Part no.</th>
<th>n</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>IZS4..-340</td>
<td>5</td>
<td>340</td>
</tr>
<tr>
<td>08</td>
<td>IZS4..-400</td>
<td>6</td>
<td>400</td>
</tr>
<tr>
<td>10</td>
<td>IZS4..-460</td>
<td>7</td>
<td>460</td>
</tr>
<tr>
<td></td>
<td>IZS4..-580</td>
<td>9</td>
<td>580</td>
</tr>
<tr>
<td></td>
<td>IZS4..-640</td>
<td>10</td>
<td>640</td>
</tr>
<tr>
<td></td>
<td>IZS4..-820</td>
<td>13</td>
<td>820</td>
</tr>
<tr>
<td></td>
<td>IZS4..-1120</td>
<td>18</td>
<td>1120</td>
</tr>
<tr>
<td></td>
<td>IZS4..-1300</td>
<td>21</td>
<td>1300</td>
</tr>
<tr>
<td></td>
<td>IZS4..-1600</td>
<td>26</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td>IZS4..-1900</td>
<td>31</td>
<td>1900</td>
</tr>
<tr>
<td></td>
<td>IZS4..-2320</td>
<td>38</td>
<td>2320</td>
</tr>
<tr>
<td></td>
<td>IZS4..-2500</td>
<td>41</td>
<td>2500</td>
</tr>
</tbody>
</table>

**End bracket/IZS40-BE**

**Intermediate bracket/IZS40-BM**

*A-A section*
Dimensions

Feedback sensor/IZS31-DF

Auto balance sensor [High accuracy type]/IZS31-DG

Power supply cable

IZS40-CP

IZS41-CP

<table>
<thead>
<tr>
<th>Part no.</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IZS40-CP</td>
<td>3000</td>
</tr>
<tr>
<td>IZS41-CP</td>
<td></td>
</tr>
<tr>
<td>IZS40-CPZ</td>
<td>9800</td>
</tr>
<tr>
<td>IZS41-CPZ</td>
<td></td>
</tr>
</tbody>
</table>

IZS  IZN  IZF  IZD  IZE  IZH

Ionizer Series IZS40/41/42
Series IZS40/41/42

Dimensions

Remote controller

Infrared rays generating part

2 AAA batteries to be set

Transition wiring cable/IZS41-CF

<table>
<thead>
<tr>
<th>Part no.</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IZF41-CF02</td>
<td>2000</td>
</tr>
<tr>
<td>IZF41-CF05</td>
<td>5000</td>
</tr>
<tr>
<td>IZF41-CF08</td>
<td>8000</td>
</tr>
</tbody>
</table>
**Warning**

1. Install the IZS series away from a wall as illustrated below.

If a wall is located closer than the illustration below, the ions generated will not be able to reach the object which requires static electricity elimination and therefore result in a decrease in efficiency.

**Caution**

1. **Warning**

3. Install the product so that the entire bar does not have an excessive deflection.

For a bar length of 820 mm or more, support the bar at both ends and in the middle by using brackets (IZS40-BM). If the bar is held only at the both ends, self-weight of the bar causes deflection, resulting in damage to the bar.

4. **Warning**

4. Do not use this product in an area where noise (electric magnetic field or surge voltage, etc.) are generated.

Using the ionizer under such conditions may cause it to malfunction or internal devices to deteriorate or break down. Take noise countermeasures and prevent the lines from mixing or coming into contact with each other.

5. **Warning**

5. Observe the tightening torque requirements when installing the ionizer.

If overtightened with a high torque, the mounting screws or mounting brackets may break. Also, if under tightened with a low torque, the connection may loosen.

Refer to the operation manual for details.

6. **Warning**

6. Do not touch the electrode needle directly with fingers or metallic tools.

If a finger is used to touch the electrode, it may get stuck or an injury or electrical shock may occur from touching the surrounding equipment. In addition, if the electrode needle or cartridge is damaged with a tool, the specification will not be met and damage and/or an accident may occur.

**Danger High Voltage**

Electrode needles are under high voltage. Never touch them as there is a danger of electric shock or injury due to an evasive action against a momentary electrical shock caused by inserting foreign matter in the electrode cartridge or touching the electrode needle.

7. **Warning**

7. Do not affix any tape or seals to the body.

If the tape or seal contains any conductive adhesive or reflective paint, a dielectric phenomenon may occur due to ions arising from such substances, resulting in electrostatic charging or electric leakage.

8. **Caution**

8. Installation should be conducted after turning off the power supply.

1. **Caution**

1. This product is intended to be used with general factory automation (FA) equipment.

If considering using the product for other applications (especially those stipulated on Safety Instructions), please consult SMC beforehand.

2. **Caution**

2. Use this product within the specified voltage and temperature range.

Using outside of the specified voltage can cause a malfunction, damage, electrical shock, or fire.

3. **Caution**

3. Use clean compressed air as fluid. (Air quality Class 2.6.3 specified in ISO 8573-1: 2001 is recommended.) This product is not explosion proof. Never use a flammable gas or an explosive gas as a fluid and never use this product in the presence of such gases.

Please contact us when fluids other than compressed air are used.

This product is not explosion proof. Never use a flammable gas or an explosive gas as a fluid and never use this product in the presence of such gases. Please contact us when fluids other than compressed air are used.

4. **Caution**

4. This product is not explosion-protected.

Never use this product in locations where the explosion of dust is likely to occur or flammable or explosive gases are used. This can cause fire.

**Caution**

1. Clean specification is not available with this product.

This product is not washed. When bringing into a clean room, flush for several minutes and confirm the required cleanliness before using. A minute amount of particles are generated due to wearing of the electrodes while the ionizer is operating.

**Warning**

1. Reserve an enough space for maintenance, piping and wiring.

Please take into consideration that the one-touch fittings for supplying air, need enough space for the air tubing to be easily attached/detached.

To avoid excessive stress on the connector and one-touch fitting, please take into consideration the cable and tube minimum bending radius and avoid bending at acute angles.

Wiring with excessive twisting, bending, etc. can cause a malfunction, wire breakage or fire.

Minimum bending radius: Power supply cable: 38 mm
Transition wiring cable: 38 mm
Sensor cable: 25 mm

Note: Shown above is wiring with the fixed minimum allowable bending radius and at a temperature of 68°F (20°C). If used under this temperature, the connector can receive excessive stress even though the minimum bending radius is allowable.

Regarding the minimum bending radius of the tubing, refer to the operation manual or catalog for tubing.

2. Mount this product on a plane surface.

If there are irregularities, cracks or height differences, excessive stress will be applied to the housing or brackets, resulting in damage or other trouble. Also, do not drop or apply a strong shock. Otherwise, damage or an accident can occur. Also, do not drop or apply a strong shock. Otherwise, damage or an accident may occur.

**Caution**

1. Mounting
**Warning**

1. Confirm that the power supply voltage is enough and that it is within the specifications before wiring.

2. To maintain product performance, a DC power supply shall be connected per UL listed Class 2 certified by National Electric Code (NEC) or evaluated as a limited power source provided by UL60950.

3. To maintain the product performance, ground the product with an earth ground cable with a resistance of 100 Ω or less according to this manual.

4. Be sure to turn off the power supply before wiring (including attachment/detachment of the connector).

5. To connect a feedback sensor or auto balance sensor to the ionizer, use the cable included with the sensor. Do not disassemble or modify the ionizer.

6. When applying the power supply, pay special attention to the wiring and/or surrounding environment until the safety is confirmed.

7. Do not connect or remove any connectors including the power supply, while power is being supplied. Otherwise, the ionizer may malfunction.

8. If the power line and high-pressure line are routed together, this product may malfunction due to noise. Therefore, use a separate wiring route for this product.

9. Be sure to confirm that there are no wiring errors before starting this product. Faulty wiring will lead to product damage or malfunction.

10. Flush the piping before using. Before piping this product, exercise caution to prevent particles, water drops, or oil contents from entering the piping.

---

**Warning**

1. After installation, be sure to verify the effects of static electricity elimination.

The effects vary depending on the ambient conditions, operating conditions, etc. After installation, verify the effects of static electricity elimination.

2. After installation, be sure to verify the effects of static electricity elimination.

3. When installing the IZS41 or IZS42 in proximity with an ionizer which operates in DC mode, they should be positioned at least 2 meters away from each other.

When using the IZS41 or IZS42 near the ionizer in DC mode, keep clearance of at least 2 m between them.

Ion balance may not be adjusted by the internal sensor due to the ions which are discharged from the DC mode ionizer.

---

**Warning**

11. Transition wiring of ionizer

For transition wiring of ionizers, use a transition wiring cable for connection between ionizers. Use a power supply cable for connection between ionizer and power supply or external equipment. (Transition wiring is not possible with the IZS40.) The number of ionizers that may be connected using transition wiring varies depending on the power supply cable; the length of the transition wiring cable; the use of external sensor(s) and/or models. Refer to the table shown below “Connectable number of ionizers with transition wiring”.

The IZS41 and IZS42 can be connected in the same transition wiring, but mixed wiring of the NPN and PNP I/O specifications is not possible. Please contact SMC when connecting conditions other than specified in the table below are applied.

**Connectable number of ionizers (IZS41) with transition wiring (without external sensor)**

<table>
<thead>
<tr>
<th>Bar length</th>
<th>Power supply cable length: 3 m</th>
<th>Transition wiring cable length (same cable length) m</th>
<th>Power supply cable length: 10 m</th>
<th>Transition wiring cable length (same cable length) m</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
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<tr>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

It is recommended that the power supply used to operate the ionizers have a current capacity twice that of the total current consumption of the ionizers to be used. Power supply voltage should be from 24 to 26.4 VDC.

AC adapter must not be used when ionizer is used in a transition wiring. When ionizers are connected with transition wiring, the same input signal serves as input to all the ionizers. When a signal is output from at least one ionizer in the connection, the signal will be output from the power supply cable.

Connect the power supply cable to the “POWER” connector of the 1st ionizer, and connect the “LINK” connector of the 1st ionizer to the “POWER” connector of the 2nd ionizer with a transition wiring cable. Follow the same procedure to connect subsequent ionizer(s) and after with transition wiring cables.
Operating Environment/Storage Environment

⚠️ Warning

1. Observe the fluid temperature and ambient temperature range.

   Fluid temperature and ambient temperature ranges are; 32 to 104°F (0 to 40°C) for ionizer, 32 to 122°F (0 to 50°C) for feedback sensor and auto balance sensor (high accuracy type), 0 to 40°C for AC adapter, and 32 to 113°F (0 to 45°C) for remote controller. Do not use the sensor in locations where the temperature may change suddenly even if the ambient temperature range is within the specified limits, resulting in condensation.

2. Do not use this product in an enclosed space.

   This product utilizes a corona discharge phenomenon. Do not use the product in an enclosed space as ozone and nitrogen oxides exist in such places, even though in marginal quantities.

3. Environments to avoid

   Avoid using and storing this product in the following environments since they may cause damage to this product.
   a. Avoid using in a place that exceeds an ambient temperature range.
   b. Avoid using in a place that exceeds an ambient humidity range.
   c. Avoid using in a place where condensation occurs due to a drastic temperature change.
   d. Avoid using in a place in the presence of corrosive or explosive gas or where there is a volatile combustible.
   e. Avoid using in an atmosphere where there are particles, conductive iron powders, oil mist, salt, solvent, blown dust, cutting oil (water, liquid), etc.
   f. Avoid using in a place where ventilated air from an air conditioner is directly applied to the product.
   g. Avoid using in a closed place without ventilation.
   h. Avoid using in direct sunlight or radiated heat.
   i. Avoid using in a place where there is a strong magnetic noise (strong electric field, strong magnetic field, or surge).
   j. Avoid using in a place where static electricity is discharged to the body.
   k. Avoid using in a place where a strong high frequency occurs.
   l. Avoid using in a place where this product is likely to be damaged by lightning.
   m. Avoid using in a place where direct vibration or shock is applied to the main body.
   n. Avoid using in a place where there is a force large enough to deform this product or weight is applied to the product.

4. Do not use an air containing mist or dust.

   The air containing mist or dust will cause the performance to decrease and shorten the maintenance cycle. Install a dryer (IDF series), air filter (AF/AFF series), and/or mist separator (AFM/AM series) to obtain clean compressed air (air quality of Class 2.6.3 or higher according to ISO 8573-1: 2001 is recommended for operation).

5. Ionizer, feedback sensor, auto balance sensor, remote controller, and AC adapter are not resistant to lightning surge.

Maintenance

⚠️ Warning

1. Periodically inspect the ionizer and clean the electrode needles.

   Periodically inspect the electrostatic sensor to check if it is operated while being out of order. Only a person having an adequate knowledge and experience about the system is allowed to inspect the sensor. If particles attach to the electrode needle by using for long periods of time, the static electricity eliminating performance will be lowered.

   Replace the electrode cartridge, if the pins are rough and the static electricity eliminating performance does not return even after being cleaned.

⚠️ Danger High Voltage

This product contains a high voltage generation circuit. When performing maintenance inspection, be sure to confirm that the power supply to the ionizer is turned off. Never disassemble or modify the ionizer, as this may not only impair the product's functionality but could cause an electric shock or electric leakage.

Caution

1. Do not drop, bump or apply excessive impact (100 m/s² or more) while handling.

   Even though it does not appear to be damaged, the internal parts may be damaged and cause a malfunction.

2. When installing the product, handle the product so that no moment is applied to the controller and the ends of the bar.

   Handling the product by holding either end of the bar may cause damage to the product.

3. When mounting/dismounting the cable, use your finger to pinch the claw of the plug, then attach/detach it correctly.

   If the modular plug is at a difficult angle to attach/detach, the jack's mounting section may be damaged and cause a disorder.
SMC can provide all the equipment required to supply air to the ionizer. Consider the equipment below not only for providing an “opportunity to decrease maintenance” and “preventing damage” but also for an “energy-saving countermeasure”.

**Recommended pneumatic circuit diagram**

1. **Air Dryer/Series IDF**
   - Decreases the dew point of compressed air.
   - Limits moisture generation which can lead to damage.
   - Built Pneumatics No.5

2. **Air Filter/Series AF**
   - Eliminates solid foreign matter such as powder particles in the compressed air.
   - Built Pneumatics No.5

3. **Mist Separator/Series AFM**
   - Eliminates oil mist which is difficult to eliminate with an air filter.
   - Built Pneumatics No.5

4. **Digital Flow Switch/Series PF2A**
   - Decreases the air consumption by flow control.
   - Built Pneumatics No.6

5. **2-Color Display Digital Flow Switch/Series PFM**
   - Built Pneumatics No.6

6. **Regulator/Series AR**
   - Decreases the air consumption by setting to an appropriate pressure.
   - Built Pneumatics No.5

7. **Digital Pressure Switch/Series ISE30A**
   - The pressure control prevents the ability of static electricity removal from being reduced in accordance with the reduction of air pressure.
   - Built Pneumatics No.6

8. **2 Port Solenoid Valve/Series VX**
   - Pilot Type 2 Port Solenoid Valve for Dry Air/Series VQ
   - Built Pneumatics No.7

9. **Clean Air Filter/Series SFD**
   - Built Pneumatics No.5

---

**Related Products**

- IZH
- IZS
- IZF
- IZN
- IZD
- IZE
- IZG
- IZH
- IZH
- IZS
Ionizer Nozzle type
Series IZN10

Dust removal and static electricity elimination by air blow
• Eliminates dust clinging to lamp cover.

Spot type static electricity elimination
• Prevents electrostatic breakdown of electric parts.
• Prevents detachment failure.

Ion balance $\pm 10\text{v}$ (In case of energy saving static electricity elimination nozzle)

Slim design: Thickness dimension 16 mm

RoHS compliant

1 Electrode needle contamination detector
Outputs maintenance signal when detects stain or wear of an electrode needle always. Detects optimal maintenance time, reduced labor for maintenance.

2 With built-in power supply substrate
High-voltage power supply cable/external high-voltage power supply are unnecessary.
Nozzle type can be selected according to applications.

**Short range static electricity elimination, Design focuses on ion balance.**

Ion balance: ±10 V
Increases flow volume by external air intake
Static electricity elimination is possible with minimal air consumption.

In cases with same air consumption, static electricity is eliminated in half the time.
(Supply pressure 44 psi (0.3 MPa))

<table>
<thead>
<tr>
<th>External air inlet</th>
<th>None</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air consumption flow rate scfm (L/min (ANR))</td>
<td>0.35 (10)</td>
<td>0.35 (10)</td>
</tr>
<tr>
<td>Static electricity elimination time sec</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Ionized air flow velocity m/s</td>
<td>0.4</td>
<td>2.5</td>
</tr>
</tbody>
</table>

* At 300 mm distance

Reduced by 50%
Improved 6 times

Eliminating static electricity from an electric substrate
- Prevents electrostatic breakdown of electric parts.

Eliminating static electricity from lenses
- Removes dust from lenses
- Prevents adhesion of dust

Eliminating static electricity from packing films
- Prevents static electricity charging when opening bags
- Prevents static electricity cling on the inside of candy bags

High flow static electricity elimination nozzle

**Long range static electricity elimination and dust removal**

Ionized air assisted by the compressed air
- Improved dust removal performance by the energy of compressed air.
- Suitable for static electricity elimination at a long distance (max. 500 mm).

Ion balance: ±15 V

Eliminating static electricity from molded goods
- Prevents problems with the separation of molded plastic goods

Eliminating static electricity from plastic cups
- Removes dust clinging to cup interiors

Eliminating static electricity from parts feeder
- Prevents clogging of parts feeder
External switch input function (2 inputs)

Prevents static electricity elimination trouble due to pressure drop of compressed air.
Emission of static electricity is suspended when abnormal purge air pressure is detected by pressure switch.

Energy saving with electrostatic sensor
Emission of static electricity is suspended when an electrostatic sensor detects that static electricity elimination is completed.

Easy maintenance
Possible to conduct maintenance on the electrode needle without removal of body.
No need to readjust the nozzle angle when the ionizer is restarted.

Intermittent control timer

IZE110-X238
A digital timer that can control ON/OFF switches of valves etc.
Improved dust removal effect under low air consumption by intermittent ion blowing.
**Mounting variations**

- **Direct mount**
  - Top through-hole mounting
  - Bottom tapped mounting

- **Bracket mount**
  - **L-bracket**
  - **Pivoting bracket**
  - **DIN rail mounting bracket**

- **Nozzle variations**
  - Circular diffusion nozzle
  - Flat diffusion nozzle
  - Bar nozzle (straight type)
  - Circumferential jet bar nozzle (straight type)
  - Bender tube nozzle
  - Long nozzle

*The L-bracket and the DIN rail mounting bracket can be used with the manifold.*

For the ionizer, please select a female thread type (RC1/8) for the piping.
### Series IZN10

#### Technical Data 1

**Static Electricity Elimination Characteristics**
*(Static Electricity Elimination Time from 1000 V to 100 V)*

<table>
<thead>
<tr>
<th>(1) Energy saving static electricity elimination nozzle/IZN10-01</th>
<th>(2) High flow rate nozzle/IZN10-02</th>
</tr>
</thead>
</table>

![Graph 1](image1)

![Graph 2](image2)

#### (3) Female threads for piping/IZN10-11

With Stainless steel 316 One-touch fitting/KQG2 + Anti-static tubing/TA

KQG2H06-01S + TA□0604 (Tube I.D.: 4 mm)

KQG2H08-01S + TA□0805 (Tube I.D.: 5 mm)

**Note** Static electricity elimination time at a distance of 50 mm from the end of tube.

* Maximum operating pressure is 15 psi (0.1 MPa).\(^1\)

---

Note 1) If a pressure over the maximum operating pressure is applied, the electrode needle contamination detector will work and turn on the LED.

- The ion generating efficiency of the high frequency AC type ionizer will decrease when the pressure around the electrode needle reaches 15 psi (0.1 MPa) or more, due to its ion generating mechanism. This means that even when the electrode needle is not contaminated, the electrode needle contamination detector may work depending on the condition of the connected tube and other reasons.

- In the range where the contamination detection signal is generated, a small amount of ions are still generated, so it can be used in some operating conditions. In this case, please consider using a type without the contamination detector. (Page 40)

- When the tube is connected using the female threads for piping / IZN10-11, be sure to check static electricity elimination performance beforehand.

Note 2) The ionizer generates a small amount of ozone. Select ozone-resistant fittings for the female threads for piping. Also, regularly check there is no deterioration due to ozone.
Series IZN10

Technical Data 2

Blow Velocity Distribution (Supply Pressure: 44 psi (0.3 MPa))

(1) Energy saving static electricity elimination nozzle/IZN10-01

(2) High flow rate nozzle/IZN10-02
Flow Characteristics

(1) Energy saving static electricity elimination nozzle/IZN10-01
(2) High flow rate nozzle/IZN10-02

(3) Female threads for piping/IZN10-11
   With Stainless steel 316 One-touch fitting/KQG2
   + Anti-static tubing/TA/L52408

Pressure: psi [MPa]
Flow rate: scfm [L/min (ANR)]

Note) When a pressure above each line is used, the electrode needle contamination detector will work and turn on the LED.
(Refer to the bottom note 1 on page 36.)
Series IZN10

Technical Data 3

Ozone Concentration

(1) Energy saving static electricity elimination nozzle/IZN10-01
(2) High flow rate nozzle/IZN10-02

Note) Ozone condensation can increase in an enclosed space.
Check the ozone condensation of the operating environment before using.
**Ionizer Series IZN10**

**How to Order**

IZN10 - **01** P 06 - - -

- **High frequency AC nozzle type**
- **Nozzle type**
  - **Symbol**
    - 01: Energy saving static electricity elimination nozzle
    - 02: High flow rate nozzle
    - 11: Female threads for piping[^note]
  - **Note:** Nozzle shape: When using the female thread for the piping, connect the fitting and the tube or nozzle to the female thread.

- **Output specification**
  - Nil
  - NPN output
  - P
  - PNP output

- **Port size**
  - 06: ø6: Metric size
  - 07: ø6.35 (1/4): Inch size
  - 16: ø6: Metric size (Elbow)
  - 17: ø6.35 (1/4): Inch size (Elbow)

**Made to Order**

- **Without electrode needle contamination detector**
  - **How to Order**
    - IZN10 - 11 - - - X194
  - **Contents/Specifications**
    - Fill in the standard model type shown above.
    - Without electrode needle contamination detector

- **Bracket**
  - Nil
  - B1: With L-bracket
  - B2: With pivoting bracket
  - B3: With DIN rail mounting bracket

- **Power supply cable**
  - Nil
  - Z: With power supply cable (3 m)
  - N: Without power supply cable

**Nozzle Variations (P.50)**

Various nozzles are available according to the installation conditions or applications.

- Circular diffusion nozzle
- Flat diffusion nozzle
- Bar nozzle (straight type)
- Bender tube nozzle
- Circumferential jet bar nozzle (straight type)

**Intermittent control timer (P.51)**

It is possible to perform the intermittent ion blow through the ON/OFF control of the valve, etc.
Series IZN10

Accessories

Bracket
- L-bracket/IZN10-B1
- Pivoting bracket/IZN10-B2
- DIN rail mounting bracket/IZN10-B3

Power supply cable
[Standard length]
- IZN10-CP (3 m)
- IZN10-CPZ (10 m)

[Non-standard length]
- IZN10-CP [01]-X13

Cable length

<table>
<thead>
<tr>
<th>No.</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1m</td>
</tr>
<tr>
<td>02</td>
<td>2m</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>20</td>
<td>20m</td>
</tr>
</tbody>
</table>

Repair Parts

Electrode needle assembly/IZN10-NT

Body assembly: IZN10-A002-

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Energy saving static electricity elimination nozzle</td>
</tr>
<tr>
<td>02</td>
<td>High flow rate nozzle</td>
</tr>
<tr>
<td>11</td>
<td>Female threads for piping Rc1/8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nozzle type</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ø6: Metric size</td>
</tr>
<tr>
<td></td>
<td>ø6.35 (1/4): Inch size</td>
</tr>
<tr>
<td>06</td>
<td>ø6: Metric size (Elbow)</td>
</tr>
<tr>
<td>07</td>
<td>ø6.35 (1/4): Inch size (Elbow)</td>
</tr>
<tr>
<td>16</td>
<td></td>
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<td>17</td>
<td></td>
</tr>
</tbody>
</table>

Cartridge assembly: IZN10-A003-

Output Type

<table>
<thead>
<tr>
<th>Nil</th>
<th>NPN output</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>PNP output</td>
</tr>
</tbody>
</table>
**Options**

**Manifold mounting parts set**
This set consists of a hexagon socket head cap screw, spacer and hexagon nut.

Note) The ionizer, L-bracket and DIN rail mounting bracket need to be prepared separately.

---

**How to Order**

**IZN10-ES**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES</td>
<td>17 mm</td>
</tr>
</tbody>
</table>

- **Mounting pitch**
- **Mounting stations**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
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<tr>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

---

**AC adapter/IZN10-F-X196**

- **Output signal specifications**
  - Nil: For NPN output
  - P: For PNP output

---

**Part no.**

<table>
<thead>
<tr>
<th>Part no.</th>
<th>L1</th>
<th>L2</th>
<th>Number of spacers</th>
</tr>
</thead>
<tbody>
<tr>
<td>IZN10-ES2</td>
<td>37</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>IZN10-ES3</td>
<td>54</td>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>IZN10-ES4</td>
<td>71</td>
<td>75</td>
<td>8</td>
</tr>
</tbody>
</table>

* Prepare two brackets and ionizer separately.

---

**Electrode needle cleaning kit/IZS30-M2**
### Specifications

<table>
<thead>
<tr>
<th>Ionizer model</th>
<th>IZN10-□□□ (NPN specification)</th>
<th>IZN10-□□□P (PNP specification)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ion generation method</td>
<td>Corona discharge type</td>
<td>Corona discharge type</td>
</tr>
<tr>
<td>Method of applying voltage</td>
<td>High frequency AC type</td>
<td>High frequency AC type</td>
</tr>
<tr>
<td>Discharge output (Note 1)</td>
<td>Energy saving static electricity elimination nozzle</td>
<td>2.5 kVAC</td>
</tr>
<tr>
<td></td>
<td>High flow rate nozzle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ozone generation (Note 3)</td>
<td>0.03 ppm (0.05 ppm for energy saving static electricity elimination nozzle)</td>
</tr>
<tr>
<td>Air purge</td>
<td>Fluid</td>
<td>Air (Clean dry air)</td>
</tr>
<tr>
<td></td>
<td>Operating pressure (Note 4)</td>
<td>7.3 to 102 psi (0.05 MPa to 0.7 MPa)</td>
</tr>
<tr>
<td></td>
<td>Connecting tube size</td>
<td>ø6, ø1/4 inch</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>24 VDC ±10%</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>80 mA</td>
<td></td>
</tr>
<tr>
<td>Input signal</td>
<td>Discharge stop signal</td>
<td>Connected to GND</td>
</tr>
<tr>
<td></td>
<td>Reset signal</td>
<td>(ON voltage: 0.6 V or less)</td>
</tr>
<tr>
<td></td>
<td>External switch signal</td>
<td>Current consumption: 5 mA or less</td>
</tr>
<tr>
<td>Output signal</td>
<td>Discharge signal</td>
<td>Max. load current: 40 mA</td>
</tr>
<tr>
<td></td>
<td>Error signal</td>
<td>Residual voltage: 1 V or less</td>
</tr>
<tr>
<td></td>
<td>Maintenance signal</td>
<td>(load current at 40 mA)</td>
</tr>
<tr>
<td></td>
<td>Effective static electricity elimination distance</td>
<td>20 mm to 500 mm</td>
</tr>
<tr>
<td></td>
<td>Ambient and fluid temperature</td>
<td>32 to 131°F (0 to 55°C)</td>
</tr>
<tr>
<td></td>
<td>Ambient humidity</td>
<td>35 to 65%RH</td>
</tr>
<tr>
<td>Material</td>
<td>Housing: ABS, Stainless steel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nozzle: Stainless steel</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electrode needle: Tungsten</td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>Durability: 50 Hz, Amplitude: 1 mm, XYZ each 2 hours</td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>10 G</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>120 g</td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Measured with a probe of 1000 MΩ and 5 pF.
Note 2) Measured with a distance of 100 mm between the charged object and ionizer at an air purge pressure of 44 psi (0.3 MPa).
For the static electricity elimination time, refer to technical data on page 36.
Note 3) Value above background level, measured with a distance of 300 mm from the front of the nozzle at an air purge pressure of 44 psi (0.3 MPa).
Also, failure of air purge can increase internal ozone condensation, adversely affecting the ionizer and peripheral equipment. Be sure to perform air purge while energizing the ionizer. When the air purge is stopped temporarily during operation of the ionizer, the discharge is stopped with the discharge stop signal input turned OFF to avoid increase in internal ion concentration.
Note 4) Nozzle shape: The operating pressure upper limit of the female thread for the piping (IZN10-□□□□□□□□) may vary depending on the mounting material. Since the ion generation efficiency decreases if the pressure around the electrode needle is 15 psi (0.1 MPa) or more as described in Note 1) on page 36, check the static electricity elimination performance with the mounting material to be used and use the nozzle at a pressure level that maintains the static electricity elimination performance.
Functions

1. Electrode needle contamination detection
   Detects lowered static electricity elimination performance due to contamination or wear of the electrode needle. The maintenance LED lights up and maintenance signal is generated.

2. Signal inputs by external switch
   There are 2 ports for external switch signal inputs.

   **Example**
   Emission of static electricity is suspended when abnormal purge air pressure is detected by pressure switch.
   • Prevents static electricity elimination trouble due to pressure drop of compressed air.

   **Example**
   An electrostatic meter is connected to stop discharge when static electricity elimination is completed.
   • Energy can be saved by stopping discharge when static electricity elimination is completed.

3. Description of LEDs

   **Description** | **Symbol** | **Color** | **Contents**
   --- | --- | --- | ---
   Power supply display | PWR | Green | Lights up when the power supply is turned on.
   Discharge | ION | Green | Lights up when static electricity is discharged.
   Irregular high voltage display | HV | Red | Lights up when an irregular current flows on an electrode needle.
   Maintenance display | NDL | Orange | Lights up when electrode needle contamination is detected.

   **Behavior of LEDs**

   | Items | PWR | ION | HV | NDL | Note |
   --- | --- | --- | --- | --- | --- |
   Normal operation (with discharge stop signal on) | ○ | ○ | | | Ions are being generated. |
   Normal operation (with discharge stop signal off) | | | | | Discharge stops. |
   Abnormal high voltage detected | ○ | | | | Discharge stops when error is detected. |
   External switch signal 1 | ○ | | | | Discharge stops when the signal is turned on. |
   External switch signal 2 | | | | | |
   Electrode needle contamination detected | ○ | ○ | | | Ions keep being generated even after the contamination is detected. |

4. Alarm

   **Alarm item** | **Description** | **Corrective actions**
   --- | --- | ---
   High voltage error | Gives notification of the occurrence of an irregular current, such as high-voltage leakage. The ionizer stops discharging, turns on the HV LED. When error occurred, the signal output is turned off. | Turn off the power, solve the problem, then turn the power on again. If the error is solved during operation, turn the reset signal off and then on. |
   Maintenance electrode needle | Gives notification that electrode needle maintenance is necessary. The NDL LED turns on and a maintenance output signal is turned on. | Turn off the power, clean the electrode needles, and turn the power on again. |
Series IZN10

Wiring

<table>
<thead>
<tr>
<th>No.</th>
<th>Cable color</th>
<th>Description</th>
<th>I/O</th>
<th>Wiring requirement</th>
<th>I/O</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown</td>
<td>Power supply +24 V</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>Blue</td>
<td>Power supply GND</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>Orange</td>
<td>Discharge stop signal</td>
<td>Input</td>
<td>–</td>
<td>Input</td>
<td>When the signal is turned on and then off, the error signal is reset. When the signal is turned off, normal operation continues.</td>
</tr>
<tr>
<td>4</td>
<td>Pink</td>
<td>Reset signal</td>
<td>Input</td>
<td>–</td>
<td>Input</td>
<td>When the signal is turned off, discharge stops.</td>
</tr>
<tr>
<td>5</td>
<td>White</td>
<td>Discharge signal</td>
<td>Output</td>
<td>–</td>
<td>Output</td>
<td>The signal stays on during discharge</td>
</tr>
<tr>
<td>6</td>
<td>Purple</td>
<td>Error signal</td>
<td>Output</td>
<td>–</td>
<td>Output</td>
<td>The signal is turned off when an error occurs</td>
</tr>
<tr>
<td>7</td>
<td>Yellow</td>
<td>Maintenance signal</td>
<td>Output</td>
<td>–</td>
<td>Output</td>
<td>The signal is turned on when maintenance is due.</td>
</tr>
<tr>
<td>8</td>
<td>Gray</td>
<td>External switch signal 1</td>
<td>Input</td>
<td>–</td>
<td>Input</td>
<td>When the signal is turned on, discharge stops.</td>
</tr>
<tr>
<td>9</td>
<td>Light blue</td>
<td>External switch signal 2</td>
<td>Input</td>
<td>–</td>
<td>Input</td>
<td>When the signal is turned on, discharge stops.</td>
</tr>
</tbody>
</table>

Note) Wiring requirement
○: Minimum wiring requirement for ionizer operation.

• Input signal

NPN: The signal is turned on when the power supply GND is connected, and turned off when disconnected.
PNP: The signal is turned on when the power supply 24 V is connected, and turned off when disconnected.

• Output signal

NPN: The signal is turned on when the output transistor is energized (by the power supply GND inside the ionizer), and turned off when de-energized.
PNP: The signal is turned on when the output transistor is energized (by the 24 V power supply inside the ionizer), and turned off when de-energized.

Provide Grounding.

1. Ground the tap for ground wiring or metal (shaded) parts around the external face of the ionizer with a resistance of 100 Ω or less.

   If grounding is not provided or is incomplete, the ionizer will not be able to achieve its specified static electricity elimination performance. Also, the maintenance signal will be generated.

2. If the product is used under the conditions that the pressure around the electrode needle becomes 15 psi (0.1 MPa) or more depending on the piping conditions stated in Note 1) on page 36, avoid to mount the grounded base or workpiece on the resin part (shaded) at locations marked with an asterisk shown in the Fig. below. If the grounded base or workpiece is mounted on the resin part (shaded) under these operating conditions, the ozone concentration around the high-voltage generation substrate inside the ionizer chassis increases, causing the substrate to break. For details about the dimensions of the resin part (shaded), refer to the dimensions on page 47.
**Power Supply Cable Connection Circuit**

**NPN**

Class D grounding to external metal parts (no electrical connection to internal circuit)

**PNP**

Class D grounding to external metal parts (no electrical connection to internal circuit)

**Timing Chart**

<table>
<thead>
<tr>
<th></th>
<th>Power supply on</th>
<th>High voltage error</th>
<th>Maintenance required</th>
<th>External switch on</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>Input: ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge stop signal</td>
<td>Input: ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reset signal</td>
<td>Input: ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge signal</td>
<td>Output: ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error signal</td>
<td>Output: ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance signal</td>
<td>Output: ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External switch signal 1, 2</td>
<td>Input: ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note:
- Discharge starts when the signal is turned on.
- The error signal can be reset by turning the reset signal on and then off.
- When an error occurs, the signal is turned off.
- Turn off the power supply and clean the electrodes.
- Ions are still generated even when the maintenance signal is turned on.

Contamination detected
Series IZN10

Dimensions

Energy saving static electricity elimination nozzle/IZN10-01
High flow rate nozzle/IZN10-02

![Diagram of energy saving static electricity elimination nozzle](image1)

![Diagram of high flow rate nozzle](image2)

Note 1) Dimensions of the resin part stated in “Provide Grounding” on page 45.

Elbow for piping port/IZN10-16

![Diagram of elbow for piping port](image3)

Female threads for piping (Rc1/8)/IZN10-11

![Diagram of female threads for piping](image4)

<table>
<thead>
<tr>
<th>Model</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IZN10-16 (mm)</td>
<td>22</td>
<td>16</td>
<td>11.5</td>
</tr>
<tr>
<td>IZN10-17 (inch)</td>
<td>24.5</td>
<td>18.5</td>
<td>12</td>
</tr>
</tbody>
</table>
Dimensions

L-bracket/IZN10-B1

Internal mounting

2 x Hexagon socket head cap screw M3 x 6
(Accessory)

Pivot mounting

Internal mounting

Pivoting bracket/IZN10-B2

2 x Hexagon socket head cap screw M3 x 16
(Accessory)
### Series IZN10

#### Dimensions

**DIN rail mounting bracket/IZN10-B3**

![Diagram of DIN rail mounting bracket](image)

- **Internal mounting**
  - Dimensions: 20.5 x 61
- **Pivot mounting**
  - Dimensions: 70 x 70
- **Accessory**
  - 2 x Hexagon socket head cap screw M3 x 6
  - (Mounting angle adjustable range) 40°
**Series IZN10**

**Made to Order 1**

This product is an individually applicable product. For details about the delivery time and price, please consult with SMC representative.

---

**Nozzle Variations**

<table>
<thead>
<tr>
<th>Circular diffusion nozzle</th>
<th>Flat diffusion nozzle</th>
<th>Bar nozzle (straight type)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Circular diffusion nozzle" /></td>
<td><img src="image2" alt="Flat diffusion nozzle" /></td>
<td><img src="image3" alt="Bar nozzle (straight type)" /></td>
</tr>
</tbody>
</table>

- **Electricity removal range**
- **Ionized air**

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Bar length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IZN10-G-100-X216</td>
<td>100</td>
</tr>
<tr>
<td>IZN10-G-200-X216</td>
<td>200</td>
</tr>
<tr>
<td>IZN10-G-300-X216</td>
<td>300</td>
</tr>
<tr>
<td>IZN10-G-400-X216</td>
<td>400</td>
</tr>
<tr>
<td>IZN10-G-500-X216</td>
<td>500</td>
</tr>
<tr>
<td>IZN10-G-600-X216</td>
<td>600</td>
</tr>
</tbody>
</table>

---

**Circumferential jet bar nozzle (straight type)**

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Bar length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IZN10-G-100-X205</td>
<td>100</td>
</tr>
<tr>
<td>IZN10-G-200-X205</td>
<td>200</td>
</tr>
<tr>
<td>IZN10-G-300-X205</td>
<td>300</td>
</tr>
<tr>
<td>IZN10-G-400-X205</td>
<td>400</td>
</tr>
<tr>
<td>IZN10-G-500-X205</td>
<td>500</td>
</tr>
<tr>
<td>IZN10-G-600-X205</td>
<td>600</td>
</tr>
</tbody>
</table>

---

**Bender tube nozzle**

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Bar length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IZN10-11□□</td>
<td>150</td>
</tr>
</tbody>
</table>

For the ionizer, please select a female thread type (Rc1/8) for the piping.
(Refer to “How to Order” for page 40.)

---

For details, refer to the product catalog available on SMC website.

---

**Part no.**

- IZN10-G-X198
- IZN10-G-X199
- IZN10-G-X216
- IZN10-G-X205
- IZN10-G-X226
- IZN10-G-X278
- IZN10-G-X280
- IZN10-G-X286
- IZN10-G-X298
- IZN10-G-X299
- IZN10-11□□

---

**Part no.**

- IZN10-G-100-X216
- IZN10-G-200-X216
- IZN10-G-300-X216
- IZN10-G-400-X216
- IZN10-G-500-X216
- IZN10-G-600-X216
- IZN10-11□□
Series IZN10
Made to Order 2
This product is an individually applicable product. For details about the delivery time and price, please consult with SMC representative.

Intermittent control timer

A digital timer that can control ON/OFF switches of valves etc.
Application: Improved dust removal effect under low air consumption by intermittent ion blowing

■ Changeable frequency 0.1 to 50.0 Hz
■ Set individual ON and OFF times 0.1 to 99.9 seconds
■ Display of accumulated number of changes
It can be used for maintaining valve or cylinder operation.
■ Switch output (Output under timer control)
■ 2 types of trigger input

<table>
<thead>
<tr>
<th>Repeat input (ON/OFF operation during trigger input)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger</td>
</tr>
<tr>
<td>on</td>
</tr>
<tr>
<td>on</td>
</tr>
</tbody>
</table>

■ One-shot input (ON/OFF operation for a time set from trigger input)

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Valve operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>on</td>
<td>off</td>
</tr>
<tr>
<td>on</td>
<td>off</td>
</tr>
</tbody>
</table>

■ Solenoid valves up to 24 VDC (4W) etc. are controllable.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>IZE110-X238</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply voltage</td>
<td>24 VDC±10% (with power supply polarity protection)</td>
</tr>
<tr>
<td>Current consumption</td>
<td>50 mA or less (Single unit only)</td>
</tr>
<tr>
<td>Connection valve</td>
<td>24 VDC 4 W or less</td>
</tr>
<tr>
<td>Max. load current</td>
<td>80 mA</td>
</tr>
<tr>
<td>Max. applied voltage</td>
<td>30 VDC</td>
</tr>
<tr>
<td>Residual voltage</td>
<td>1 V or less (At load current 80 mA)</td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>With short circuit protection</td>
</tr>
<tr>
<td>Trigger input</td>
<td>No-voltage input, Low level input 10 ms or more, Low level 0.4 V or less</td>
</tr>
<tr>
<td>Indicator light</td>
<td>(Green/Red)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP40</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>Operating: 0 to 50°C, Stored: −10 to 60°C (with no freezing or condensation)</td>
</tr>
<tr>
<td>Operating humidity range</td>
<td>Operating/Stored: 35 to 85% RH (with no condensation)</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>50 MΩ or more (500 VDC measured via megohmmeter), between terminals and housing</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 20 m/s² acceleration, in X, Y, Z direction for 2 hrs. each (De-energized)</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>100 m/s² in X, Y, Z directions 3 times each (De-energized)</td>
</tr>
<tr>
<td>Material</td>
<td>Front case: PBT, Rear case: Denaturated PPE</td>
</tr>
<tr>
<td>Weight</td>
<td>50 g</td>
</tr>
</tbody>
</table>

Note) Do not use a load that generates surge voltage.
Warning

1. This product is intended to be used with general factory automation (FA) equipment.
   If considering using the product for other applications (especially those stipulated in 4 on back cover), please consult with SMC beforehand.

2. Use this product within the specified voltage and temperature range.
   Using outside of the specified voltage can cause a malfunction, damage, electrical shock, or fire.

3. Use clean compressed air for fluid.
   This product is not explosion proof. Never use a flammable gas or an explosive gas as a fluid and never use this product in the presence of such gases.
   Please contact us when fluids other than compressed air are used.

4. This product is not explosion-protected.
   Never use this product in locations where the explosion of dust is likely to occur or flammable or explosive gases are used. This can cause fire.

Caution

1. This product is not washed. When bringing into a clean room, flush for several minutes and confirm the required cleanliness before using.

Warning

1. Reserve an enough space for maintenance, piping and wiring
   Please take into consideration that the One-touch fittings for supplying air, need enough space for the air tubing to be easily attached/detached.
   To avoid excessive stress on the connector and One-touch fitting, please take into consideration the air tubing minimum bending radius and avoid bending at acute angles.
   Wiring with excessive twisting, bending, etc. can cause a malfunction, wire breakage, fire or air leakage.
   Minimum bending radius: Power supply cable………35 mm
   (Note: Shown above is wiring with the fixed minimum allowable bending radius and at a temperature of 68°F (20 °C). If used under this temperature, the connector can receive excessive stress even though the minimum bending radius is allowable.)
   Regarding the minimum bending radius of the air tubing, refer to the instruction manual or catalog for tubing.

2. If the ionizer is to be mounted directly, mount it on a flat face.
   If the mounting face is curved, distorted and/or uneven, excessive force will be applied to the ionizer, which may cause damage and failure of the ionizer. Also, dropping or exposing the ionizer to other strong impact may cause failure or accident.

Mounting

3. Do not use this product in an area where noise (electric magnetic field or surge voltage, etc.) are generated.
   Using the ionizer under such conditions may cause it to malfunction or internal devices to deteriorate or break down. Take noise countermeasures and prevent the lines from mixing or coming into contact with each other.

4. Observe the tightening torque requirements when installing the ionizer. Refer to the following table for tightening torques for screws, etc.
   If overtightened with a high torque, the mounting screws or mounting brackets may break. Also, if under tightened with a low torque, the connection may loosen.

<table>
<thead>
<tr>
<th>Thread size</th>
<th>Recommended tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3</td>
<td>0.45 to 0.46 lbf·ft (0.61 to 0.63 N·m)</td>
</tr>
</tbody>
</table>

5. Do not allow foreign matter or tools to enter the nozzle.
   The inside of the nozzle contains electrode needles. If a metal tool makes contact with the electrode needles, it can cause electric shock, resulting in a sudden movement by the operator that can cause further injuries such as hitting the body on peripheral equipment. Also, if the tool damages the electrode needle, the ionizer may fail or cause an accident.

   Electrode needles are under high voltage. Never touch them as there is a danger of electric shock or injury due to an evasive action against a momentary electrical shock caused by inserting foreign matter in the electrode cartridge or touching the electrode needle.

6. Do not apply moment to the nozzle.
   If a copper long nozzle is mounted horizontally, moment will be applied to the nozzle. Then if vibration occurs, the nozzle can be damaged. If a moment of 0.037 lbf·ft (0.05 N·m) or more will be applied, mount a support to the middle part of the nozzle so that the moment is not applied to the nozzle.

7. Do not affix any tape or seals to the main unit.
   If the tape or seal contains any conductive adhesive or reflective paint, a dielectric phenomenon may occur due to ions arising from such substances, resulting in electrostatic charging or electric leakage.

8. Installation and adjustment should be conducted after turning off the power supply.
Specific Product Precautions 2
Be sure to read this before handling. Refer to back cover for Safety Instructions.

**Wiring/Piping**

**Warning**

1. Before wiring confirm if the power supply voltage is enough and that it is within the specifications before wiring.
2. Always use a UL listed Class 2 output 24 VDC power supply.
3. Be sure to ground with a resistance of 100 Ω or less to maintain the product performance.
   If such grounding is not provided, not only may static electricity removal capability be disrupted but electric shocks may also result and the ionizer or power supply may break down.
4. Be sure to turn off the power supply before wiring (including attachment/detachment of the connector).
5. When applying the power supply, pay special attention to the wiring and/or surrounding environment until the safety is confirmed.
6. Do not connect or remove any connectors including the power supply, while power is being supplied. Otherwise, the ionizer may malfunction.
7. If the power line and high pressure line are routed together, this product may malfunction due to noise. Therefore, use a separate wiring route for this product.
8. Be sure to confirm there are no wiring errors before starting this product.
   Incorrect wiring will lead to damage or malfunction to the product.
9. Flush the piping before using.
   Before using this product, exercise caution to prevent particles, water drop, or oil from entering the piping.

**Operating Environment/Storage Environment**

**Warning**

1. Do not use this product in an enclosed space.
   This product utilizes a corona discharge phenomenon. Do not use the product in an enclosed space as ozone and nitrogen oxides exist in such places, even though in marginal quantities. Also, ozone condensation can increase if used in an enclosed space, which can affect the human body, so ventilation is necessary. Even if ventilation is secured, the use of two more ionizers in a narrow space can increase ozone condensation. Therefore, check that ozone condensation is not more than a standard value of 0.1 ppm in the operating environment while the ionizer is in operation.
2. Take preventative measures against ozone.
   Equipment used around the ionizer should have ozone-prevention measures. Also, regularly check that there is no deterioration due to ozone.
3. The ionizer cannot be used without air purge.
   Without air purge, not only will the ionizer be unable to eliminate charge, but also the internal ozone condensation will increase and adversely affect the ionizer and peripheral equipment. Therefore, be sure to perform air purge when energizing the ionizer.
4. Observe the fluid and ambient temperature range.
   Fluid and ambient temperature ranges are 32 to 131°F (0 to 55°C) for the ionizer. Do not use the ionizer in locations subject to sudden temperature changes even if the ambient temperature range is within the specified limits, as condensation may result.
5. Environments to avoid
   Avoid using and storing this product in the following environments since they may cause damage to this product.
   a) Avoid using in a place that exceeds an ambient temperature range of 32 to 131°F (0 to 55°C).
   b) Avoid using in a place that exceeds an ambient humidity range of 35 to 65% Rh.
   c) Avoid using in a place where condensation occurs due to a drastic temperature change.
   d) Avoid using in a place in the presence of corrosive or explosive gas or where there is a volatile combustible.
   e) Avoid using in an atmosphere where there are particles, conductive iron powders, oil mist, salt, solvent, blown dust, cutting oil (water, liquid), etc.
   f) Avoid using in a place where ventilated air from an air conditioner is directly applied to the product.
   g) Avoid using in a closed place without ventilation.
   h) Avoid using in direct sunlight or radiated heat.
   i) Avoid using in a place where there is a strong magnetic noise (strong electric field, strong magnetic field, or surge).
   j) Avoid using in a place where the main body is electro-statically discharged.
   k) Avoid using in a place where a strong high frequency occurs.
   l) Avoid using in a place where this product is likely to be damaged by lightning.
   m) Avoid using in a place where direct vibration or shock is applied to the main body.
   n) Avoid using in a place where there is a force large enough to deform this product or weight is applied to the product.
6. Do not use an air containing mist or dust.
   The air containing mist or dust will cause the performance to decrease and shorten the maintenance cycle. Supply clean compressed air by using an air dryer (Series IDF), air filter (Series AF/AFF), and mist separator (Series AFM/AM)
7. The ionizer is not designed to withstand lightning.
**Series IZN10**
**Specific Product Precautions 3**

Be sure to read this before handling. Refer to back cover for Safety Instructions.

---

### Maintenance

**⚠️ Warning**

1. Periodically (for example, every two weeks) inspect the ionizer and clean the electrode needles.
   Conduct a regular maintenance to see if the product is run having a disorder.
   Maintenance should be conducted by a fully knowledgeable and experienced person about the equipment. Using for long periods of time will lower the static electricity eliminating performance, if particles attach to the electrode pin. When the maintenance signal LED lights up, clean the electrode needle.
   Replace the electrode cartridge, if the pins are worn and the static electricity eliminating performance does not return even after being cleaned.

**⚠️ Danger High Voltage!**

This product contains a high voltage generation circuit. When performing maintenance inspection, be sure to confirm that the power supply to the ionizer is turned off. Never disassemble or modify the ionizer, as this may not only impair the product's functionality but could cause an electric shock or electric leakage.

2. The tube and fitting must be treated as consumable parts.
   The tube and fitting that are connected to the female piping ports of the ionizer can deteriorate due to ozone and need to be replaced regularly or use an ozone-resistant type.

3. When cleaning the electrode pin or replacing the electrode cartridge, be sure to turn off the power supply to the main body.
   Touching an electrode needle when it is electrified may result in electric shock or other accidents.

4. Do not disassemble or modify this product.
   Otherwise, an electrical shock, damage and/or a fire may occur.
   Also, the disassembled or modified products may not achieve the performances guaranteed in the specifications, and exercise caution because the product will not be warranted.

5. Do not operate this product with wet hands.
   Otherwise, an electrical shock or accident may occur.

---

### Handling

**⚠️ Warning**

1. Do not drop, bump or apply excessive impact (10 G or more) while handling.
   Even though it does not appear to be damaged, the internal parts may be damaged and cause a malfunction.

2. When mounting/dismounting the cable, use your finger to pinch the claw of the modular plug, then attach/detach it correctly. Otherwise, modular plug mounting section may be damaged and cause a disorder.
Compact fan type with simple functions

- Compact design (H x W x D): 80 x 110 x 39 mm
- Weight: 280 g
- 2 types of fans available

Static electricity elimination time: 1.5 seconds
(When eliminating static electricity from 1000 V to 100 V at a distance of 300 mm from the workpiece)

Low-noise fan:
48 dB (A) (Measured at a distance of 300 mm from the workpiece)

Rapid static electricity eliminating fan: 57 dB (A)

- Ion balance*: ±13 V
- With alarm function
  High-voltage error, electrode needle contamination detector

Specifications

<table>
<thead>
<tr>
<th>Ionizer model</th>
<th>IZF10-□□</th>
<th>IZF10-L-□□</th>
<th>IZF10-P-□□</th>
<th>IZF10-LP-□□</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ion generation method</td>
<td>Corona discharge type (DC)</td>
<td>Corona discharge type (DC)</td>
<td>Corona discharge type (DC)</td>
<td>Corona discharge type (DC)</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>24 VDC ±10%</td>
<td>24 VDC ±10%</td>
<td>24 VDC ±10%</td>
<td>24 VDC ±10%</td>
</tr>
<tr>
<td>Output</td>
<td>NPN open collector output</td>
<td>PNP open collector output</td>
<td>NPN open collector output</td>
<td>PNP open collector output</td>
</tr>
<tr>
<td>Air flow</td>
<td>0.66 m³/min</td>
<td>0.46 m³/min</td>
<td>0.66 m³/min</td>
<td>0.46 m³/min</td>
</tr>
<tr>
<td>Power consumption</td>
<td>6.1 W or less</td>
<td>3.7 W or less</td>
<td>6.6 W or less</td>
<td>4.8 W or less</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>Operation: 32 to 122°F (0 to 50°C), Storage: 14 to 140°F (–10 to 60°C)</td>
<td>Operation, Storage: 35 to 80% RH (No condensation)</td>
<td>Operation, Storage: 35 to 80% RH (No condensation)</td>
<td>Operation, Storage: 35 to 80% RH (No condensation)</td>
</tr>
<tr>
<td>Weight</td>
<td>280 g (With bracket: 360 g)</td>
<td>280 g (With bracket: 360 g)</td>
<td>280 g (With bracket: 360 g)</td>
<td>280 g (With bracket: 360 g)</td>
</tr>
</tbody>
</table>

Installation distance and static electricity elimination time (1000 V → 100 V)

<table>
<thead>
<tr>
<th>Installation distance (mm)</th>
<th>0</th>
<th>300</th>
<th>600</th>
<th>900</th>
<th>1200</th>
<th>1500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static electricity elimination time (sec)</td>
<td>0</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>40</td>
</tr>
</tbody>
</table>

How to Order

- Fan type
- Air flow
- Rapid static electricity eliminating fan
  - N: Nil
  - L: Low-noise fan
- Power supply cable
  - Nil: None
  - Z: With power supply cable (3 m)
  - H (Note): e-con connector
  - Q: AC adapter (with AC cable)
  - R: AC adapter (without AC cable)
  - N: None
- Bracket
  - B: With bracket

Note) Based on ANSI/ESD-STM3.1-2006 standards

Note) Based on ANSI/ESD-STM3.1-2006 standards

Note) The power supply cable option (H) is a supply connector for customers who have prepared a cable.
Dimensions

Ion balance adjustment trimmer

Holding bolt
Bracket
Power switch
LED indicators

Without bracket

Ion balance adjustment trimmer

Variable angle

IZF10-CG1
With AC cable

IZF10-CG2
Without AC cable

Wiring

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Lead wire (color)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown</td>
<td>24 VDC</td>
</tr>
<tr>
<td>2</td>
<td>Blue</td>
<td>GND</td>
</tr>
<tr>
<td>3</td>
<td>Green</td>
<td>F.G.</td>
</tr>
<tr>
<td>4</td>
<td>Purple</td>
<td>Emergency output</td>
</tr>
</tbody>
</table>

IZS
IZN
IZF
IZD
IZE
IZH

56
**Electrostatic Sensor**

**Series IZD10/IZE11**

- **Potential measurement:** $\pm 20 \text{ kV}$ (detected at a 50 mm distance)
  
  $\pm 0.4 \text{ kV}$ (detected at a 25 mm distance)

- **Detects the electrostatic potential and outputs in an analog voltage.**
  - Output voltage: 1 to 5 V (Output impedance: Approx. 100 $\Omega$)

  The importance of the static electric control is put on confirming the “actual status”.

- **Output:** Switch output x 2 + Analog output (1 to 5 V, 4 to 20 mA)

- **Minimum unit setting:** 0.001 kV (at $\pm 0.4 \text{ kV}$), 0.1 kV (at $\pm 20 \text{ kV}$)

- **Display accuracy:** $\pm 0.5\%$ F.S. $\pm 1$ digit or less

- **Detection distance correction function**
  (adjustable in 1 mm increments)

- **Supports two types of sensors**
  ($\pm 0.4 \text{ kV}$ and $\pm 20 \text{ kV}$) through range selection

**Electrostatic sensor monitor Series IZE11**
Electrostatic Sensor/Series IZD10

Small and easy to mount

**Dimensions**

<table>
<thead>
<tr>
<th>Installation distance (mm)</th>
<th>Detection range (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>20</td>
<td>85</td>
</tr>
<tr>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td>40</td>
<td>150</td>
</tr>
<tr>
<td>50</td>
<td>180</td>
</tr>
</tbody>
</table>

IZD10-110

IZD10-510

**Installation Distance and Detection Range**

**IZD10-110**

**IZD10-510**

<table>
<thead>
<tr>
<th>Installation distance (mm)</th>
<th>Detection range (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td>40</td>
<td>150</td>
</tr>
<tr>
<td>50</td>
<td>180</td>
</tr>
<tr>
<td>60</td>
<td>205</td>
</tr>
<tr>
<td>70</td>
<td>225</td>
</tr>
<tr>
<td>75</td>
<td>235</td>
</tr>
</tbody>
</table>

**Notes:**
- ±0.4 kV at installation distance: 25 mm
- ±20 kV at installation distance: 50 mm

**Electrostatic Sensor Monitor/Series IZE11**

**2-color display** (Red/Green)

Able to set the display color in 4 patterns.

**Connection by connector**

- Connector for power supply/output
- e-con connector

**Mountable even with a sensor touched with each other**

Possible to reduce panel fitting labor.

**Functions**

- Detection distance correction
- Peak/Bottom value indication
- Keylock
- Zero-adjust
- Error display
- Switch output anti-chattering
- Selection of connection sensor
Series IZD10

Technical Data

Output Signal

When measuring the potential of a charged object with an electrostatic sensor, the relationship between the electrostatic potential being measured and the output voltage varies depending on the sensor's installation distance. The relationship in the installation distance between the electrostatic sensor's output voltage and the detected electrostatic potential is as shown in the figure below: (The installation distance in the figure refers to the distance between the object being measured and the electrostatic sensor.)

Relationship in installation distance between electrostatic potential and sensor output voltage

IZD10-110

Detection Range

The relationship between the electrostatic sensor's installation distance and the detection range is as follows:

IZD10-110
(Potential measurement: ±0.4 kV)

<table>
<thead>
<tr>
<th>Installation distance (mm)</th>
<th>Detection range (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>20</td>
<td>85</td>
</tr>
<tr>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td>40</td>
<td>150</td>
</tr>
<tr>
<td>50</td>
<td>180</td>
</tr>
</tbody>
</table>

IZD10-510
(Potential measurement: ±20 kV)

<table>
<thead>
<tr>
<th>Installation distance (mm)</th>
<th>Detection range (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>100</td>
</tr>
<tr>
<td>30</td>
<td>120</td>
</tr>
<tr>
<td>40</td>
<td>150</td>
</tr>
<tr>
<td>50</td>
<td>180</td>
</tr>
<tr>
<td>60</td>
<td>205</td>
</tr>
<tr>
<td>70</td>
<td>225</td>
</tr>
<tr>
<td>75</td>
<td>235</td>
</tr>
</tbody>
</table>
# Electrostatic Sensor Series IZD10

## How to Order

IZD 10 — 1 10

<table>
<thead>
<tr>
<th>Model</th>
<th>Electrostatic sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

**Potential measurement**

<table>
<thead>
<tr>
<th>Model</th>
<th>Potential measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>±0.4 kV (at detection distance: 25 mm) (Note)</td>
</tr>
<tr>
<td>510</td>
<td>±20 kV (at detection distance: 50 mm) (Note)</td>
</tr>
</tbody>
</table>

**Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>IZD10-110</th>
<th>IZD10-510</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential measurement</td>
<td>±0.4 kV (at detection distance: 25 mm) (Note)</td>
<td>±20 kV (at detection distance: 50 mm) (Note)</td>
</tr>
<tr>
<td>Output voltage</td>
<td>1 to 5 V (Output impedance: Approx. 100 Ω)</td>
<td></td>
</tr>
<tr>
<td>Effective detection distance</td>
<td>10 to 50 mm</td>
<td>25 to 75 mm</td>
</tr>
<tr>
<td>Linearity</td>
<td>±5% F.S. (0 to 50°C, at detection distance: 25 mm)</td>
<td>±5% F.S. (0 to 50°C, at detection distance: 50 mm)</td>
</tr>
<tr>
<td>Output delay time</td>
<td>100 ms or less</td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>24 VDC ±10%</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>40 mA or less</td>
<td></td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>32 to 122°F (0 to 50°C)</td>
<td></td>
</tr>
<tr>
<td>Operating ambient humidity</td>
<td>35 to 85% Rh (with no condensation)</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Head case: ABS Amplifier case: ABS</td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>Durability 50 Hz Amplitude 1 mm X, Y, Z each 2 hours</td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>100 m/s²</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>185 g (including cable weight)</td>
<td></td>
</tr>
<tr>
<td>Compliance with EN standards</td>
<td>Protective class: Class III (EN60950-1) Pollution Degree 3 CE marking: Low voltage directive: 2006/95/EC Only when connected to a SELV-type external circuit.</td>
<td></td>
</tr>
<tr>
<td>EMC directive</td>
<td>2004/108/EC</td>
<td></td>
</tr>
<tr>
<td>UL standards</td>
<td>UL508</td>
<td></td>
</tr>
</tbody>
</table>

Note) The relationship between the measured potential and the output voltage varies depending on the detection distance. For details on the relationship in the detection distance between the measured potential and the output voltage, refer to the graph in “Technical Data - Output Signal” on page 60.
Connection Circuit and Wiring Table

Connect the lead wires according to the following connection circuit and wiring table.

1. Connection circuit

2. Wiring table

<table>
<thead>
<tr>
<th>Lead wire color</th>
<th>Description</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown</td>
<td>DC (+)</td>
<td>Power supply 24 VDC</td>
</tr>
<tr>
<td>Blue</td>
<td>DC (–)</td>
<td>Power supply 0 V</td>
</tr>
<tr>
<td>White</td>
<td>Sensor output</td>
<td>Analog output 1 to 5 V</td>
</tr>
</tbody>
</table>

Warning

Always ground the electrostatic sensor.

Be sure to ground the GND terminal with a resistance value of 100 Ω or less. In addition, a dedicated power supply is recommended for use as the sensor-driving power supply. Connecting any equipment other than the sensor to this power supply may trigger the malfunctioning or breakdown of the equipment when static electricity is discharged to the sensor head or when noise enters the GND terminal.

Note) When using the cable on the external equipment connection side after cutting it short, do not connect a shielding wire (since the shielded line is wired in common with the amplifier case, provide a frame ground on the amplifier case side).

* Text in ( ) refers to each lead wire coating color of the dedicated cable.

Dimensions

IZD10-110
IZD10-510

[Diagram of Electrostatic Sensor Series IZD10]

[Diagram of Dimensions]
Electrostatic Sensor Monitor
Series IZE11

How to Order

IZE11 0

Input/Output specifications:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Part No.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>NPN open collector 2 outputs + Analog output 1-5 V</td>
<td>ZS-28-A</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>NPN open collector 2 outputs + Analog output 4-20 mA</td>
<td>ZS-28-B</td>
<td>With M3 x 5L (2 pcs.)</td>
</tr>
<tr>
<td>2</td>
<td>PNP open collector 2 outputs + Analog output 1-5 V</td>
<td>ZS-27-C</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PNP open collector 2 outputs + Analog output 4-20 mA</td>
<td>ZS-27-D</td>
<td>With M3 x 8L (2 pcs.)</td>
</tr>
</tbody>
</table>

Options/Part No.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector cable for power supply / output (2 m)</td>
<td>ZS-28-A</td>
<td></td>
</tr>
<tr>
<td>Bracket</td>
<td>ZS-28-B</td>
<td>With M3 x 5L (2 pcs.)</td>
</tr>
<tr>
<td>Connector for sensor connection</td>
<td>ZS-28-C</td>
<td>1 pc.</td>
</tr>
<tr>
<td>Panel mount adapter</td>
<td>ZS-27-C</td>
<td>With M3 x 8L (2 pcs.)</td>
</tr>
<tr>
<td>Panel mount adapter + Front protective cover</td>
<td>ZS-27-D</td>
<td>With M3 x 8L (2 pcs.)</td>
</tr>
</tbody>
</table>

Note) The connector is not connected but packed together with product for shipment.

Option 1

Nil

Nil

C

With connector for sensor connection
Connector for sensor connection (e-con connector) ZS-28-C

Note) The connector is not connected but packed together with product for shipment.

Option 2

Nil

Bracket

Mounting screw (M3 x 5L)

Panel mount adapter

Panel

Panel mount adapter

Panel mount adapter

Mounting screw (M3 x 8L)

Mounting screw (M3 x 8L)

Panel protective cover

Panel protective cover

Panel mount adapter

Mounting screw (M3 x 8L)

Note) The options are not attached but packed together with product for shipment.
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>IZE11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection sensor</td>
<td>IZD10-110, IZD10-510</td>
</tr>
<tr>
<td>Rated measurement range</td>
<td>−0.4 kV to +0.4 kV (Note 1)</td>
</tr>
<tr>
<td>Min. unit setting</td>
<td>0.001 kV</td>
</tr>
<tr>
<td>Measurement distance setting</td>
<td>10 to 50 mm</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>24 VDC ±10% or less (with power supply polarity protection)</td>
</tr>
<tr>
<td>Current consumption</td>
<td>50 mA or less (excluding sensor unit's current consumption)</td>
</tr>
<tr>
<td>Sensor input</td>
<td>1 to 5 VDC (Input impedance: 1 MΩ)</td>
</tr>
<tr>
<td>Number of inputs</td>
<td>1 input</td>
</tr>
<tr>
<td>Input protection</td>
<td>With excess voltage protection (up to 26.4 V)</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>Hysteresis mode: Variable</td>
</tr>
<tr>
<td>Window comparator mode: Variable</td>
<td></td>
</tr>
<tr>
<td>Switch output</td>
<td>NPN or PNP open collector: 2 outputs</td>
</tr>
<tr>
<td>Max. load current</td>
<td>80 mA</td>
</tr>
<tr>
<td>Max. applied voltage</td>
<td>30 VDC (with NPN output)</td>
</tr>
<tr>
<td>Residual voltage</td>
<td>1 V or less (with load current of 80 mA)</td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>With short circuit protection</td>
</tr>
<tr>
<td>Response time (including sensor response time)</td>
<td>100 ms or less</td>
</tr>
<tr>
<td>Response time with anti-chattering function: 500 ms, 1 s, 2 s or less</td>
<td></td>
</tr>
<tr>
<td>Voltage output</td>
<td>Output voltage: 1 to 5 V (with rated pressure range), Output impedance: Approx. 1 kΩ</td>
</tr>
<tr>
<td>Accuracy (for readings) (77°F (25°C))</td>
<td>±1% F.S.</td>
</tr>
<tr>
<td>Current output</td>
<td>Output current: 4 to 20 mA (with rated pressure range)</td>
</tr>
<tr>
<td>Max. load impedance: 600 Ω (at 24 VDC), Min. load impedance: 50 Ω</td>
<td></td>
</tr>
<tr>
<td>Accuracy (for readings) (77°F (25°C))</td>
<td>±1% F.S.</td>
</tr>
<tr>
<td>Response time (including sensor response time)</td>
<td>200 ms (without filter), 1.5 s (with filter) or less</td>
</tr>
<tr>
<td>Display accuracy</td>
<td>±0.5% F.S. ±1 digit</td>
</tr>
<tr>
<td>Display</td>
<td>3 + 1/2 digit, 7-segment indicator, 2-color display (Red/Green) Sampling cycle: 5 times/s</td>
</tr>
<tr>
<td>Indicator light</td>
<td>OUT1: Lights up when output is turned ON (Green), OUT2: Lights up when output is turned ON (Red).</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP40</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>Operating: 32 to 122°F (0 to 50°C), Stored: 14 to 104°F (−10 to 60°C) (with no freezing or condensation)</td>
</tr>
<tr>
<td>Operating humidity range</td>
<td>Operating/Storage: 35 to 85% RH (with no condensation)</td>
</tr>
<tr>
<td>Withstand voltage</td>
<td>1000 VAC for 1 minute between terminals and housing</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s² acceleration, in X, Y, Z direction for 2 hrs. each (De-energized)</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>100 m/s² in X, Y, Z directions 3 times each (De-energized)</td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±0.5% F.S. (77°F (25°C) reference)</td>
</tr>
<tr>
<td>Connection method</td>
<td>Power supply, Output connection: 5-pin connector, Sensor connection: 4-pin connector</td>
</tr>
<tr>
<td>Material</td>
<td>Front case: PBT, Rear case: PBT</td>
</tr>
<tr>
<td>Weight (excluding power supply/output connection cable)</td>
<td>30 g</td>
</tr>
<tr>
<td>Standards</td>
<td>CE marking, UL (CSA) compliant</td>
</tr>
</tbody>
</table>

Note 1) Rated value when the distance between the charged object and the sensor is 25 mm
Note 2) Rated value when the distance between the charged object and the sensor is 50 mm
### Description

**LCD display**
Shows the current electrostatic potential, set mode, and error code. Four display methods are available for selection, including an option for always displaying in a single color, red or green, and an option for switching from green to red in conjunction with the output.

**Output (OUT1) display (Green)**
Turns on when the OUT1 output is on.

**Output (OUT2) display (Red)**
Turns on when the OUT2 output is on.

**▲ button**
Use this button to change the mode or increase the ON/OFF set value. It also allows you to switch to the peak value display mode.

**SET button**
Use this button to switch the mode and set the set value.

**▼ button**
Use this button to change the mode or decrease the ON/OFF set value. It also allows you to switch to the bottom value display mode.

---

**Example of Internal Circuit and Wiring**

### Output specifications
The wire colors (brown, black, white, gray and blue) shown in the circuit diagram apply when SMC’s power supply and output connection cable (Part no.: ZS-28-A) are used.

#### IZE110
NPN open collector output: 2 outputs
- Max. 30 V, 80 mA
- Residual voltage 1 V or less
- Analog output: 1 to 5 V
- Output impedance: Approx. 1 kΩ

#### IZE111
NPN open collector output: 2 outputs
- Max. 30 V, 80 mA
- Residual voltage 1 V or less
- Analog output: 4 to 20 mA
- Max. load impedance: 600 Ω (24 VDC)
- Min. load impedance: 50 Ω

#### IZE112
PNP open collector output: 2 outputs
- Max. 80 mA
- Residual voltage 1 V or less
- Analog output: 1 to 5 V
- Output impedance: Approx. 1 kΩ

#### IZE113
PNP open collector output: 2 outputs
- Max. 80 mA
- Residual voltage 1 V or less
- Analog output: 1 to 5 V
- Output impedance: Approx. 1 kΩ
Electrostatic Sensor Monitor Series IZE11

Dimensions

Connection cable for power supply/output (ZS-28-A)

- DC (+) Brown 5
- OUT1 Black 4
- OUT2 White 3
- Analog output Gray 2
- DC (–) Blue 1

Connector for sensor connection

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Terminal name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC (+)</td>
</tr>
<tr>
<td>2</td>
<td>N.C.</td>
</tr>
<tr>
<td>3</td>
<td>DC (–)</td>
</tr>
<tr>
<td>4</td>
<td>IN (1 to 5 V)</td>
</tr>
</tbody>
</table>

With bracket

- Bracket

With panel mount adapter

- Panel thickness 0.5 to 6

With panel mount adapter + Front protective cover

- Panel mount adapter + Front protective cover
Dimensions

Panel fitting dimensions  
+ Panel thickness: 0.5 to 6 mm

More than 1 pc. (n pcs.) horizontal mounting

More than 1 pc. (n pcs.) vertical mounting

Individual mounting

Note) When providing a curvature radius (R), keep it to R2 or smaller.
Function Details

A Detection range correction function
By previously inputting a distance from the sensor to the object being measured, it is possible to reduce errors due to variations in the measurement distance.

B Peak/Bottom value indication
This function constantly detects and updates the maximum and minimum pressure values and allows to hold the display value.

C Keylock function
This function prevents incorrect operations such as changing the set value accidentally.

D Zero-adjust function
The reading of the measured voltage can be adjusted to zero. The reading can be corrected within ±10% of F.S. from the factory-set condition.

E Error display function

<table>
<thead>
<tr>
<th>Error description</th>
<th>Error display</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over-current error</td>
<td>OUT1 Er1</td>
<td>Load current of switch output is more than 80 mA.</td>
</tr>
<tr>
<td></td>
<td>OUT2 Er2</td>
<td></td>
</tr>
<tr>
<td>System error</td>
<td>Er3</td>
<td>Internal data error</td>
</tr>
<tr>
<td>Zero-adjust error</td>
<td>Er4</td>
<td>During zero adjustment, an amount of static electricity beyond ±10% of F.S. has been given to the sensor. After displaying the error code for approximately one second, the sensor automatically returns to measurement mode. The zero point may slightly fluctuate depending on the individual product difference and the sensor's mounting condition during zero adjustment.</td>
</tr>
<tr>
<td>Over-flow</td>
<td>HHH</td>
<td>The displayable range has been exceeded because an amount of static electricity beyond the upper limit of the voltage measurement range has been given to the sensor or the measurement distance setting and/or the sensor mounting position is inappropriate, or for other reasons.</td>
</tr>
<tr>
<td>Under-flow</td>
<td>LLL</td>
<td>The sensor may not have been wired yet or may have mistakenly wired. Alternatively, the displayable range has been exceeded because an amount of static electricity beyond the upper limit of the voltage measurement range has been given to the sensor or the measurement distance setting and/or the sensor mounting position is inappropriate, or for other reasons.</td>
</tr>
</tbody>
</table>

F Anti-chattering function
The charged voltage may vary temporarily. This function prevents such a momentary change from being detected as an abnormal voltage by changing the response time setting.
Response time: 100 ms, 500 ms, 1 s, 2 s or less
(Principal) When a measured value is retained for an optionally set time length (delay time), the sensor compares the measured value with the set point to provide a switched output.

G Connection sensor selection function
The type (range) of electrostatic sensor to be connected can be selected. The monitor is factory-set to the ±0.4 kV option.
Electrostatic Sensors Precautions 1

**Selection**

⚠️ **Warning**

1. This product is intended to be used with general factory automation (FA) equipment.
2. Use this product within the specified voltage and temperature range.
3. This product is not explosion-protected.
   - Never use this product in environment, where dust explosion may occur or flammable or explosive gases are used. This can cause fire.
● **Caution**
   - Do not blow the clean dry air into a clean room, remove particles using the clean dry air before using the product, confirm that its cleanliness satisfies the required level.

<table>
<thead>
<tr>
<th>Selection</th>
</tr>
</thead>
</table>

**Mounting**

⚠️ **Warning**

1. Reserve an enough space for maintenance, piping and wiring.
   - Please take into consideration that the port location for external equipment, need enough space for the cable to be easily attached/detached.

<table>
<thead>
<tr>
<th>Mounting</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Caution</strong></th>
</tr>
</thead>
</table>

1. Install the electrostatic sensor away from walls, etc., as shown below:
   - The ionizer may fail to measure electrostatic potentials correctly if a wall or other obstacles exist within the clearances shown in the following figure.

2. After installation, always make sure that the electrostatic potential is measured correctly.
   - Errors may occur in the detected electrostatic potential depending on the ambient installation conditions, etc. After installation, check the sensor's condition with regard to electrostatic potential detection.
Series IZD10
Electrostatic Sensors Precautions 2
Be sure to read this before handling. Refer to back cover for Safety Instructions and pages 71 and 72 for Specific Product Precautions.

Wiring/Piping

⚠️ Warning
1. Before wiring confirm if the power supply voltage is enough and that it is within the specifications before wiring.
2. To maintain the product performance, ground the FG terminal with a resistance value of 100 Ω or less while referring to the instructions stated in this document.
   When using a commercially available switching regulator, ground the GND and FG terminals.
3. When applying the power supply, pay special attention to the wiring and/or surrounding environment until the safety is confirmed.
4. Do not remove or attach wires from/to any parts, including the power supply, while the sensor is turned on, as this may cause the surface electrostatic sensor to malfunction. Be sure to the sensor is turned off prior to performing any wiring (including plugging/unplugging connectors).
5. If the power line and high pressure line are routed together, this product may malfunction due to noise. Therefore, use a separate wiring route for this product.
6. Be sure to confirm there are no wiring errors before starting this product.
   Faulty wiring will lead to product damage or malfunction.
   Applying 24 VDC to the sensor output will directly lead to internal circuitry breakdown.

Operating Environment/Storage Environment

⚠️ Warning
3. The electrostatic sensor is not resistant to lightning surges.
   Take measures for protection against lightning surges on the system side.

Maintenance

⚠️ Caution
1. Periodically inspect the electrostatic sensor to check if it is operated while being out of order.
   Only a person having an adequate knowledge and experience about the system is allowed to inspect the sensor.
2. Do not disassemble or rebuild this product.
   Otherwise, an electrical shock, damage and/or a fire may occur. Also, the disassembled or rebuilt products may not achieve the performances guaranteed in the specifications, and exercise caution because the product will not be warranted.

Handling

⚠️ Warning
1. Do not drop, bump or apply excessive impact (100 m/s² or more) while handling.
   Even though it does not appear to be damaged, the internal parts may be damaged and cause a malfunction.
2. Do not operate this product with wet hands. Otherwise, an electrical shock or accident may occur.
3. Before use, allow the sensor to warm up for 10 minutes or more after power-on.
   The sensor may provide unsteady readings immediately after power-on.
4. Use a UL-approved DC power supply compatible with the UL1310 Class 2 Power Unit or with power units comprising a UL1585 Class 2-compliant transformer, in combination with the sensor.
Mounting of Electrostatic Sensor

1. When using the electrostatic sensor, install it in a location where the detection hole of the sensor head can detect the object being measured. (Refer to “Technical Data – Detection Range” on page 60.)

2. Install the sensor so that the distance between the detection hole and the object’s surface is within 10 to 50 mm when the IZD10-110 is used and within 25 to 75 mm when the IZD10-510 is used. Be careful not to allow the sensor head to come into contact with the object. Static electricity may be discharged through the sensor head depending on the electrostatic potential of the object. Keep the installation distance long enough to prevent static electricity from being discharged through the sensor head. Be very careful about this since electrostatic discharge through the sensor head may cause the sensor to break down.

The detection range and the sensor output vary depending on the installation distance. For more information, refer to “Technical Data - Output Signal and - Detection Range” on page 60.

3. Use two M3-size screws (should be prepared separately) to mount the sensor head.

Recommended tightening torque for M3 screws: 0.45 to 0.46 lbf·ft (0.61 to 0.63 N·m)

4. Align bolts with their seating surfaces to mount the sensor head. Mounting it by inserting the bolts from the opposite side may damage the sensor head.

The sensor head enclosure is in common with the GND terminal for reasons of the sensor structure. When installing or turning on the sensor, be very careful to avoid the enclosure from being short-circuited to the +24 V power supply. The detection hole is opened in order to detect static electricity. If any foreign matters enter the hole or the inner part of the hole is touched with a hand tool, etc., the sensor may malfunction or break down, resulting in a failure to correctly detect static electricity. Be careful not to allow any foreign matters to enter the inner part or touch it with a hand tool, etc. Do not pull the cable extending from the sensor head or twist it at the head’s neck. Forcibly pulling or twisting the cable in this manner may cause the sensor head and/or the cable to break down.

Mounting of Sensor Amplifier

1. Use two M3-size screws (should be prepared separately) to mount the sensor amplifier.

Recommended tightening torque for M3 screws: 0.45 to 0.46 lbf·ft (0.61 to 0.63 N·m)

2. Align bolts with their seating surfaces to mount the sensor amplifier.

Mounting it by inserting the bolts from the opposite side may damage the sensor amplifier.

3. Do not pull the cable extending from the sensor amplifier or twist it at the amplifier’s neck.

Forcibly pulling or twisting the cable in this manner may cause the sensor amplifier and/or the cable to break down.

4. Be sure to ground the FG terminal with a resistance value of 100 Ω or less since the sensor amplifier case is common to the FG terminal.

Recommended crimping terminal: TMEN1.25-3 insulation-coated crimping terminal from NICHIFU Co., Ltd.
Mounting Precautions

1. Avoid placing any objects other than the object being measured or the sensor head cable close to the detection hole.
   
   If any objects other than the object being measured are placed in the vicinity of the electrostatic sensor during sensor installation, the sensor will be affected by the objects thus placed and the sensor output will differ from the actual value.

2. To fix the sensor, use a bracket not coated with an insulating layer such as paint or a surface treatment material.
   
   If any objects need to be placed near the electrostatic sensor, place them at a distance greater than the minimum installation clearances shown in the following table.

<table>
<thead>
<tr>
<th>Installation distance (mm)</th>
<th>Min. installation clearance (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>30</td>
<td>55</td>
</tr>
<tr>
<td>40</td>
<td>65</td>
</tr>
<tr>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>75</td>
<td>105</td>
</tr>
</tbody>
</table>

3. Use the electrostatic sensor where there is no equipment nearby that generates electric or magnetic fields.
   
   The electrostatic sensor is susceptible to electric and magnetic fields for reasons of its operating principle. If there are any current-carrying cables, transformers or radio equipment near the sensor head, the sensor may fail to correctly detect static electricity.

Timing Chart

The following is a timing chart where the installation distance (from the object being measured) of the electrostatic sensor is assumed to be 25 mm. (The installation distance is 50 mm for the IZD10-510.)

Note 1) The sensor is ready for operation approximately one second after power-on but may provide unsteady readings. It is therefore recommended that the sensor be used more than 10 minutes after power-on.

Note 2) The values are for the IZD10-110, while values in [ ] are for the IZD10-510.
Electrostatic Sensor Monitor

Operating Environment

**Warning**

1. Our electrostatic sensor monitor are CE marked; however, they are not equipped with surge protection against lightning. Lightning surge countermeasures should be applied directly to system components as necessary.

2. Our electrostatic sensor monitor do not have an explosion proof rating. Never use in the presence of an explosive gas as this may cause a serious explosion.

**Wiring**

**Warning**

1. Insert the connector straight while pinching the lever, and then push the lever into the jack of the housing and lock it.

2. Pull the connector straight out while applying pressure with your thumb to the lever and unhooking it from the jack.

**Mounting**

**Caution**

1. Mounting with a bracket
   Mount a bracket to the body using two M3 x 5L mounting screws. Tightening torque for bracket mounting screw should be 0.37 to 0.52 lbf ft (0.5 to 0.7 N·m).

2. Mounting with panel mount adapter
   Mount a panel mount adapter using two M3 x 8L mounting screws.

3. When removing the panel mount adapter
   To remove the electrostatic sensor monitor with a panel mount adapter from user equipment, first remove the two mounting screws, then push the clips outward as shown in the figure and pull the monitor back towards you. Removing the monitor otherwise may damage the monitor and/or the panel mount adapter.

**Setting**

**Caution**

1. Connection pin no. of connection cable for power supply/output
   - DC (+) Brown 5
   - OUT1 Black 4
   - OUT2 White 3
   - Analog Gray 2
   - DC (–) Blue 1

**Warning**

1. If not correctly set to the option specified for the connected sensor, the monitor will fail to display correct electrostatic potentials.

When initially setting up the monitor or connecting a sensor to the monitor, always make sure that the selected option and the electrostatic sensor agree with each other.

* The monitor is factory-set to the ±0.4 kV option.
Easy-to-use handheld electrostatic meter

- Rated charge amount range: ±20.0 kV
- Minimum display unit: 0.1 kV (±1.0 to ±20.0 kV)
  0.01 kV (0 to ±0.99 kV)

Check the current situation before taking anti-static electricity measures!

- Compact & Lightweight: 85 g (excluding dry cell batteries)
- Peak/Bottom value indication
- Zero-clear function
- Auto power-off function
- LOW battery indicator
- Backlight for reading in the dark
Handheld Electrostatic Meter

**Series IZH10**

### How to Order

IZH 10 –

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>None</td>
</tr>
<tr>
<td>H</td>
<td>High-voltage measuring handle</td>
</tr>
</tbody>
</table>

### Accessories and Option/Part Number for Individual Parts

- **Ground wire (1.5 m)/Accessories**
  - IZH-A-01

- **Soft case/Accessories**
  - IZH-B-01

- **High-voltage measuring handle/Option**
  - IZH-C-01

*The ground wire and soft case are attached to the IZH series.*

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>IZH10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated charge amount range</td>
<td>±20.0 kV</td>
</tr>
<tr>
<td>Minimum display unit</td>
<td>0.1 kV (±1.0 kV to ±20.0 kV), 0.01 kV (0 to ±0.99 kV)</td>
</tr>
<tr>
<td>Measurement distance</td>
<td>50 mm (between sensor part and measured target)</td>
</tr>
<tr>
<td>Power supply (Note 1)</td>
<td>1.5 VDC 2A alkali dry cell battery, 2 pcs (continuous use for 15 hours or more, see Note 2)</td>
</tr>
<tr>
<td>Display accuracy</td>
<td>±5% F.S. ±1 digit</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP40</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>Operating: 32 to 104°F (0 to 40°C), Stored: 14 to 140°F (−10 to 60°C) (with no freezing or condensation)</td>
</tr>
<tr>
<td>Operating humidity range</td>
<td>Operating/Stored: 35 to 85% R.H. (with no condensation)</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s² acceleration, in X, Y, Z directions for 2 hs. each (De-energized)</td>
</tr>
<tr>
<td>Impact resistance</td>
<td>100 m/s² in X, Y, Z directions 3 times each (De-energized)</td>
</tr>
<tr>
<td>Material</td>
<td>Display part: PC/ABS Sensor part: ABS</td>
</tr>
<tr>
<td>Weight</td>
<td>85 g (excluding dry cell batteries)</td>
</tr>
<tr>
<td>Standards</td>
<td>CE marking</td>
</tr>
<tr>
<td>Accessories</td>
<td>Ground wire, Soft case</td>
</tr>
</tbody>
</table>

Note 1) 2A alkali dry cell batteries are not included, and must be acquired separately.
Note 2) When new alkali dry cell batteries are used at ordinary temperature.
Dimensions (Unit: mm)

Display part

Sensor part

Best detecting position: 50mm

POWER LIGHT

Measured Potential: ±20.0kV

BATTERY 1.5V x 2 LR6

Auto Power-Off Extension: Press for 6 sec

Peak / Bottom Mode Display:

Power

Press! Press!

Made in Japan

Extends at 15 min
Series IZH10

Names and Functions of Individual Parts

Function Details

A Peak/Bottom value indication
The function constantly detects and updates the maximum and minimum electrostatic potential value and allows holding the display value.

B Zero-clear function
This function clears and resets the zero value on the display of measured pressure.
The reading can be corrected within ±5% of F.S. from the factory-set condition.

C LOW battery indicator
When the batteries are low it is displayed in two stages: “Battery LOW” and “Replace Battery”. The battery level is indicated by the flashing or lightening up of “ L” on the display. • “ L” flashes: Prepare to replace batteries. • “ L” lights up: Replace batteries with new ones.

D Auto power-off function
If no button is operated for 5 min. or more while the power supply is on, the power supply will turn off automatically. When the [POWER] button is pressed for 6 sec. or more with the power supply off, continuous operating time while no button is pushed will extend to 15 min.

E Light-up of backlight
The display can be easily seen in the dark. The backlight will be turned on and off by every press of the [LIGHT] button.

F Displayed digit change function
The minimum display digit is changed for the charged potential between –0.99 kV to +0.99 kV.

Error Display

<table>
<thead>
<tr>
<th>Error description</th>
<th>Error display</th>
<th>Condition</th>
</tr>
</thead>
</table>
| Zero clear error  | $E_r^1$       | A charge over ±5% F.S. of default potential is applied to the sensor.  
* The indication lasts approx. 1 sec. and then measurement mode returns automatically.  
There will be a slight displacement, depending on the deviation of the sensor itself and ambient environment. |
| Sensor error      | $E_r^2$       | The sensor breaks. |
| System error      | $E_r^3$       | Internal data error. |
| Measurement error | $HHH$         | A charge over the upper limit of the measured voltage range is applied to the sensor, or the distance to the measured target is outside of specified range. |
|                   | $LLL$         | A charge over the lower limit of the measured voltage range is applied to the sensor, or the distance to the measured target is outside of specified range. |
| Cable breakage    | —             | A broken cable prevents accurate measurement. 
The charge amount can be detected, but it will not change the displayed value. |
Series IZH10
Handheld Electrostatic Meter Precautions
Be sure to read this before handling. Refer to back cover for Safety Instructions.

### Handling Precautions

⚠️ Warning

1. Do not make any modifications (including exchanging the printed circuit board) to the product.
   It may cause human injuries and damage.

2. Use the device in the condition of specified range.
   Using it out of the specified range may result in fires, electric shock, or damage. Confirm the specifications before using.

3. Measurement near high-voltage
   Avoid measuring near high-voltage exceeding specifications as it can be dangerous.

4. Handling of ground wire
   Be sure to provide a ground wire to ensure safety and high-accuracy measurement when using the sensor.
   Also, if the ground wire is not connected properly, the power is pooled in the sensor part and/or ground terminal, which can discharge to an operator's hand. Handle the sensor part and ground terminal carefully.
   **If grounding is not provided,**
   - Measurement accuracy gets worse.
   - The sensor is charged and can discharge to an operator's hand.

5. Do not apply strong impact.
   Do not drop, allow collision or apply excessive shock to the sensor when handling. It can result in damage of the sensor and accidents.

6. Distance measurement is 50 mm. Use display of label attached to the sensors as a guide.

![Distance measurement diagram]

7. The measurement of a part with a high-charge potential can be highly dangerous as it can cause a discharge to the user's hand.
   In this case, use a handle specific for measuring high voltage, which is available as an option, and wear rubber gloves, etc. Also, gradually bring the sensor part close to the measured target from a distance, and stop the measurement immediately when the displayed value overflows (HHH) or underflows (LLL). (A target with a high-charge potential is very dangerous. The measured value does not changed even if the distance is shortened.)

### Operating Environment

⚠️ Warning

1. Handheld electrostatic meters are CE marked; however, they are not equipped with surge protection against lighting. Lighting surge countermeasures should be applied directly to system components as necessary.

2. Handheld electrostatic meters do not have an explosion proof rating. Never use in the presence of an explosive gas as this may cause a serious explosion.
These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)^1, and other safety regulations.

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**Safety Instructions**

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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**Caution:** Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

**Warning:** Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

**Danger:** Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

---

**Warning**

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications. Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunctions.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

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**Caution**

1. The product is provided for use in manufacturing industries.

   The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

   If anything is unclear, contact your nearest sales branch.

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**Limited warranty and Disclaimer/Compliance Requirements**

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

**Limited warranty and Disclaimer**

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\(^1\)

   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

\(^1\) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

**Compliance Requirements**

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.