Potential amplitude: 25 V or less

Rapid neutralization of static electricity: Fastest time: 0.1 seconds

Dual AC type *Series IZS42*
Potential amplitude of the workpiece is reduced with Dual AC type.

Feedback sensor type *Series IZS41*
Rapid neutralization 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, Discharge time from 1000 V to 100 V
Discharged object: Charged plate (150 mm x 150 mm, capacitance 20 pF)
Installation distance: 200 mm (Tungsten electrode needle with air purge)

According to the establishment of the JIS Glossary of Terms, the applicable terms were changed to JIS terms. Refer to the JIS C 61340-4-7 for more details.
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 neutralization in consideration of damage to a device which is sensitive to electrostatic discharge (ESD) can be achieved.

Potential amplitude applied to the applicable workpiece is reduced even if it the workpiece is mounted within close proximity of the ionizer.

Comparison of potential amplitude between AC type and dual AC type

(Installation height of sensor: 300 mm)

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

Neutralizing static electricity on a glass substrate

Prevents the breakage of glass substrates due to the static electricity which is generated when the substrate is lifted from the surface plate.

Neutralizing static electricity on an electric substrate

Prevents the breakage of electric substrates due to the static electricity which is generated when the substrates are picked up after dicing.

Standard type Series IZS40

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

Discharge time = 3.2 seconds (41% shortened)

when installed at long distance (1000 mm)

Static neutralization data when voltage is reduced from 1000 V to 100 V.

Conditions: Ion generation frequency 30 Hz  Supply pressure: 0.1 MPa

High speed static neutralization cartridge

Neutralizing static electricity on a glass substrate

·Prevents breakage due to adhesion and discharge.

·Prevents adhesion of dust.

Neutralizing static electricity on an electric substrate

·Prevents element disruption due to discharge.

·Prevents adhesion of dust.

Neutralizing static electricity on PET bottles

·Trip-resistance during conveying

·Prevents adhesion of dust.

Neutralizing static electricity on molded goods

·Improves detachability of molded goods from a die.

Neutralizing static electricity on a glass substrate

·Prevents breakage due to adhesion and discharge.

·Prevents adhesion of dust.
Feedback sensor type **Series IZS41** (High speed static neutralization specification)

**Rapid neutralization of static electricity by a feedback sensor**

The discharge speed 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 neutralization (electrostatic potential: within ±30 V) can be selected.**

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

Continuous static neutralization run mode

<table>
<thead>
<tr>
<th>Mode</th>
<th>Ion emission waveform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy saving run</td>
<td>-</td>
</tr>
<tr>
<td>Continuous static neutralization run</td>
<td>-</td>
</tr>
<tr>
<td>AC (Without sensor)</td>
<td>-</td>
</tr>
<tr>
<td>Workpiece electrification</td>
<td>Static neutralization completion</td>
</tr>
</tbody>
</table>

**Neutralizing static electricity on molded goods**

- Prevents breakage due to adhesion and discharge.
- Prevents adhesion of dust.

**Neutralizing static electricity on an electric substrate**

- Prevents element disruption due to discharge.
- Prevents adhesion of dust.

**Neutralizing static electricity on a glass substrate**

- Prevents breakage due to adhesion and discharge.
- Prevents adhesion of dust.

**Neutralizing static electricity on molded goods**

- Prevents adhesion of dust.

**Neutralizing static electricity on PET bottles**

- Trip-resistance during conveying

**Suitable for static neutralization of resin and rubber pieces (small parts).**

**AC adapter power supply is available.**

- e-con connector is used.

- Feedback sensor

Detected the polarity of a discharged object and measures the charged voltage.

Supply pressure: 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

Discharge time (s) 10
(41% shortened)

Electrostatic potential (V)
-40
-20
20
40
0

Surface potential of workpiece (V)

Comparison of potential amplitude between AC type and dual AC type

**Series IZS40**

<table>
<thead>
<tr>
<th>Electrostatic potential (V)</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>1</td>
</tr>
<tr>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>-1</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

**Series IZS41**

<table>
<thead>
<tr>
<th>Electrostatic potential (V)</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>1</td>
</tr>
<tr>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>-1</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

**Series IZS42**

<table>
<thead>
<tr>
<th>Electrostatic potential (V)</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>1</td>
</tr>
<tr>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>-1</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

**Series IZS43**

<table>
<thead>
<tr>
<th>Electrostatic potential (V)</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>1</td>
</tr>
<tr>
<td>-2</td>
<td>2</td>
</tr>
<tr>
<td>-1</td>
<td>3</td>
</tr>
<tr>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

**Note** An auto balance sensor is installed.
Series IZS40/41/42

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. The offset voltage (ion balance) in the static neutralization area is controlled so that the voltage is maintained at a constant value by monitoring the ions emitted from the ionizer using the ground line, and adjusting the + and - ion supply rate.

Effect of autobalance sensor (Image)

High accuracy type (Option)
- The ion balance near the workpiece is accurately adjusted.
- Reduces the variation in the offset voltage of the static neutralization area due to the effect from the installation height and disturbance.

Auto balance sensor
Measures the nearest offset voltage.

Low maintenance emitter cartridges are used.
- Minimizes contamination of emitters by discharging compressed air at the surface of the emitters.

2 types of emitter materials
- Tungsten: General-purpose emitter excellent against wear
- Single crystal silicon: Emitter specialized in static neutralization of silicon wafers

- Tungsten (Emitter cartridge color: White)
- Silicon (Emitter cartridge color: Gray)

- Monitoring +/- return current
- Air covers the emitter.
Reduction of adjustment and maintenance labor by auto balance sensor

Low maintenance emitter cartridges are used.
The sensor is installed within the ionizer body and may be mounted anywhere.

Built-in type (Standard)
- The ion balance near the workpiece is accurately adjusted.

High accuracy type (Option)
- Ions are transferred to the workpieces efficiently by using two pneumatic nozzles to improve the static neutralization performance.

Neutralization of static electricity with reduced air consumption through the use of one pneumatic nozzle.

Air covers the emitter.

Tungsten (Emitter cartridge color: White)
- Electrode needle

Silicon (Emitter cartridge color: Gray)
- + return current
- – return current
- Monitoring +/– return current

Series IZS40/41/42
- Minimizes contamination of emitters by discharging compressed air at the surface of the emitters.

High speed static neutralization cartridges and energy saving static neutralization cartridges are available.

High speed de-ionizing cartridge

Energy saving type de-ionizing cartridge

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

The discharge speed is reduced by approximately 20 to 30%.

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
- Offset voltage adjustment
- Maintenance 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

- Emitter cartridge drop prevention function
  Locking by double-action

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

When attached to the body

Refer to page 5 for Models and Functions.
## Ionizer Series IZS40/41/42

### Models and Functions

<table>
<thead>
<tr>
<th>Series</th>
<th>IZS42</th>
<th>IZS41</th>
<th>IZS40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method of applying voltage</td>
<td>Dual AC</td>
<td>AC, Sensing AC, DC</td>
<td>AC, DC</td>
</tr>
<tr>
<td>Auto balance sensor</td>
<td>Built-in type (Standard)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High accuracy type (Option)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback sensor (Option)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I/O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transition wiring may be used, Note 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance detector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect high voltage warning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low maintenance emitter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emitter cartridge</td>
<td>Energy saving type de-ionizing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High speed de-ionizing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With One-touch fitting (ø6, ø8, ø10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bracket mount</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-standard bar length (Made to Order)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1)** Order transition wiring separately.

### Accessories sold separately (per series)

<table>
<thead>
<tr>
<th>Series</th>
<th>IZS42</th>
<th>IZS41</th>
<th>IZS40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote controller</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC adapter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drop prevention cover</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning kit</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**5**
Application Examples

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

**Neutralizing static electricity on film molded goods**
- Prevents attaching to conveyer.
- Prevents dispersion of finished goods.

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

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

**Neutralizing static electricity from lens**
- Removes dust from lens.
- Prevents adhesion of dust.

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

Static Neutralization Characteristics

1) Installation Distance and Discharge Time (Discharge Time from 1000 V to 100 V)

IZS40, 41

1) Without air purge

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

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

Note) Static neutralization 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). For “Sensing AC” mode, the installation height of the sensor is 25 mm. 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

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

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

Note: Static neutralization 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.

2) Static Neutralization Range

IZS40, 41
Frequency: 30 Hz

1) Supply pressure: 0 MPa

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

3) With energy saving type de-ionizing cartridge, Supply pressure: 0.3 MPa
IZS42

Frequency: 30 Hz

1) Supply pressure: 0 MPa

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

3) With energy saving type de-ionizing cartridge, Supply pressure: 0.3 MPa
Static Neutralization Characteristics

Note: Static neutralization 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.

3 Potential Amplitude

IZS40, 41
Supply pressure: 0.3 MPa

With high speed de-ionizing cartridge

IZS42
Supply pressure: 0.3 MPa

With high speed de-ionizing cartridge

With energy saving type de-ionizing cartridge
4 Flow Rate — Pressure Characteristics

How to measure

a) Single side air supply (Connecting tube: O.D. ø6 x I.D. ø4) (IZS4□-340, 400, 460, 580, 640)

b) Both sides air supply (Connecting tube: O.D. ø6 x I.D. ø4) (IZS4□-820, 1120, 1300)

c) Both sides air supply (Connecting tube: O.D. ø8 x I.D. ø5) (IZS4□-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 (mm)</th>
<th>Detection range (mm)</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>

Enlarged view of sensor head
Ionizer Series IZS40/41/42

Specifications
- Made to Order

**Sensor**
- Nil: Built-in sensor
- F: Feedback sensor
- G: Auto balance sensor [High accuracy type]

- **Bracket**
  - Nil: Without bracket
  - B: With bracket

- **Bracket**
  - With 1 pc.
  - With 2 pcs.
  - With 3 pcs.
  - With piping on one side
  - With piping on both sides

- **Power supply cable**
  - N: With power supply cable (3 m)
  - P: With power supply cable (10 m)

- **Bar length symbol**
  - X10

- **Recommended piping port size**

**Type 40** IZS 40 - 1600 - 10 B - X10

**Type 41/42** IZS 42 - 1600 - 10 B

**Made to Order**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Contents</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>-X10</td>
<td>Non-standard bar length</td>
<td>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.)</td>
</tr>
</tbody>
</table>

**Ordering example**
IZS 40 - 1660 - 10 B - X10
IZS 42 - 1660 - 10 B

**Type**
- 41
- 42

**Bar length**
- 520 1420 1780 2140
- 700 1480 1840 2200
- 760 1540 1960 2250
- 880 1660 2020 2380
- 940 1720 2080 2440

**Remarks**
- Since input/output function cannot be used, specify "Nil" when the AC adapter is being used.
- 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 16). (A cord is attached to the AC adapter.)

- The number of intermediate brackets differ depending on the bar length. (Refer to the table below.)

- Refer to the table below for selection of One-touch fittings.

- Made to Order

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Contents</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>-X14</td>
<td>Model with drop prevention</td>
<td>The main unit is shipped fitted with a drop prevention cover available as an option.</td>
</tr>
</tbody>
</table>

(A cord is attached to the AC adapter.)
## 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, Sensing AC, DC</td>
<td>AC, Sensing AC, DC</td>
<td>AC, Sensing AC, DC</td>
<td>AC, Sensing AC, DC</td>
</tr>
<tr>
<td>Applied voltage</td>
<td>±7,000 V</td>
<td>±6,000 V</td>
<td>±6,000 V</td>
<td>±6,000 V</td>
<td>±6,000 V</td>
</tr>
<tr>
<td>Offset voltage</td>
<td>Within ±30 V</td>
<td>Connected to 0 V</td>
<td>Connected to +24 V</td>
<td>Connected to +24 V</td>
<td>Connected to +24 V</td>
</tr>
<tr>
<td>Air purge</td>
<td>Fluid</td>
<td>Air (Clean dry air)</td>
<td>Voltage range: 5 VDC or less</td>
<td>Voltage range: 5 VDC or less</td>
<td>Voltage range: 5 VDC or less</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>0.5 MPa or less</td>
<td>0.7 MPa</td>
<td>Max. load current: 100 mA</td>
<td>Max. load current: 100 mA</td>
<td>Max. load current: 100 mA</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>0.6, 0.8, 1.0</td>
<td>Max. load current: 100 mA</td>
<td>Max. load current: 100 mA</td>
<td>Max. load current: 100 mA</td>
<td>Max. load current: 100 mA</td>
</tr>
<tr>
<td>Current consumption</td>
<td>330 mA or less</td>
<td>440 mA or less, (Sensing AC, Automatic run/Manual run: 460 mA or less)</td>
<td>700 mA or less, (Automatic run/Manual run: 740 mA or less)</td>
<td>700 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>
</tr>
<tr>
<td>Power supply voltage in a transition wiring</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Input signal</td>
<td>Discharge stop signal</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Maintenance detection signal</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Output signal</td>
<td>Maintenance detection signal</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Error signal</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Function</td>
<td>Incorrect high voltage ion discharge detection</td>
<td>Offset voltage control with the built-in sensor, maintenance detection, incorrect high voltage ion discharge detection</td>
<td>Off ociation stops during detection, ion discharge stop input, transition wiring, remote controller (sold separately), external sensor connection</td>
<td>Off ociation stops during detection, ion discharge stop input, transition wiring, remote controller (sold separately), external sensor connection</td>
<td>Off ociation stops 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, (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>
<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>0 to 40°C</td>
<td>0 to 40°C</td>
<td>0 to 40°C</td>
<td>0 to 40°C</td>
<td>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>

### Number of emitter 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 emitter 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>2320</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>0 to 50°C</td>
<td>0 to 40°C</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>35 to 80% RH (with no condensation)</td>
<td>35 to 65% 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>—</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>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>—</td>
</tr>
<tr>
<td>Power supply</td>
<td>2 AAA sized batteries (sold separately), Nixie 2</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>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>53 g (excluding dry cell batteries)</td>
</tr>
<tr>
<td>Standards/Directive</td>
<td>CE</td>
</tr>
</tbody>
</table>

### Construction

#### Series IZS40

![Series IZS40 Diagram]

#### Series IZS41/42

![Series IZS41/42 Diagram]
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)

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

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

End bracket/IZS40-BE

Intermediate bracket/IZS40-BM

Made to Order

<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>
<tr>
<td>19</td>
<td>19 m</td>
</tr>
<tr>
<td>20</td>
<td>20 m</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.

<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>None</td>
</tr>
<tr>
<td>1680 to 2380</td>
<td>With 2 pcs.</td>
<td>None</td>
</tr>
<tr>
<td>2440 to 2500</td>
<td>With 3 pcs.</td>
<td>None</td>
</tr>
</tbody>
</table>

Note) The model number is for a single bracket.
Ionizer Series IZS40/41/42

Sold Separately

Drop prevention cover

IZS40-E 3

- Number of fixed emitter cartridges
  - IZS40-E3: 3
  - IZS40-E4: 4
  - IZS40-E5: 5

- Number of required drop prevention covers
<table>
<thead>
<tr>
<th>Bar length (symbol)</th>
<th>Number of required drop prevention covers</th>
</tr>
</thead>
<tbody>
<tr>
<td>340</td>
<td>—</td>
</tr>
<tr>
<td>400</td>
<td>2</td>
</tr>
<tr>
<td>460</td>
<td>1</td>
</tr>
<tr>
<td>580</td>
<td>1</td>
</tr>
<tr>
<td>640</td>
<td>1</td>
</tr>
<tr>
<td>820</td>
<td>1</td>
</tr>
<tr>
<td>1120</td>
<td>1</td>
</tr>
<tr>
<td>1300</td>
<td>2</td>
</tr>
<tr>
<td>1500</td>
<td>2</td>
</tr>
<tr>
<td>2320</td>
<td>1</td>
</tr>
<tr>
<td>2500</td>
<td>1</td>
</tr>
</tbody>
</table>

Remote controller/IZS41-RC

AC adapter

For IZS40

IZF10-C

- AC adapter

  | G1 | AC adapter + AC cord |
  | G2 | AC adapter (without AC cord) |

  * 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.

For IZS41/42

IZS41-C

- AC adapter

  | G1 | AC adapter + AC cord |
  | G2 | AC adapter (without AC cord) |

  * 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 X13

- Transition wiring cable

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

Made to Order

How to Order

IZS41-CF X13

- Transition wiring cable length

<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>03</td>
<td>3 m</td>
</tr>
<tr>
<td>19</td>
<td>19 m</td>
</tr>
<tr>
<td>20</td>
<td>20 m</td>
</tr>
</tbody>
</table>

Cleaning kit/IZS30-M2

Mounted part of emitter cartridge

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

When attached to the body

AC adapter + AC cord

AC adapter (without AC cord)

For IZS41/42

AC adapter

For IZS41/42

AC adapter

AC adapter + AC cord

AC adapter (without AC cord)

For IZS40

AC adapter

AC adapter + AC cord

AG adapter (without AC cord)
**Wiring/IZS40**

Wire cables according to the circuitry and wiring chart.

1. **Grounding of F.G. cable**
   Make sure to ground the F.G. cable (green) with a ground resistance of 100 Ω or less.
   The F.G. cable is used as a reference electric potential for de-ionization. If the ground terminal is not properly grounded, an optimal offset voltage cannot be acquired and also causes failure of the equipment. Be sure to connect the ground terminal using a ground 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.)

   ![Diagram of F.G. connection](image)

   **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.

   ![Diagram of connector connection](image)

   **Applicable wire**

<table>
<thead>
<tr>
<th>AWG No.</th>
<th>Conductor cross section (mm²)</th>
<th>Finish O.D. (mm)</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>26-24</td>
<td>0.14-0.2</td>
<td>ø0.8-ø1.0</td>
<td>ZS-28-C</td>
</tr>
</tbody>
</table>

   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.

   ![Diagram of connector connection](image)

   **Connection Circuit/IZS40**

   **Ionizer (IZS40)**

   ![Diagram of IZS40 circuit](image)

   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/IZS41, 42

#### Wiring

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Cable color</th>
<th>Cable size</th>
<th>Description</th>
<th>Signal direction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Brown</td>
<td></td>
<td>+24 VDC</td>
<td>IN</td>
<td>Power supply is connected to operate the ionizer.</td>
</tr>
<tr>
<td>B1</td>
<td>Blue</td>
<td></td>
<td>0 V</td>
<td>IN</td>
<td>Make sure to ground with a ground resistance of 100 Ω or less to use it as a reference electric potential for ionizer.</td>
</tr>
<tr>
<td>A2</td>
<td>Green</td>
<td>AWG20</td>
<td>F.G.</td>
<td>—</td>
<td>Make sure to ground with a ground resistance of 100 Ω or less to use it as a reference electric potential for ionizer.</td>
</tr>
<tr>
<td>B2</td>
<td>Light green</td>
<td>AWG28</td>
<td>Discharge stop signal</td>
<td>IN</td>
<td>Make sure to ground with a ground resistance of 100 Ω or less to use it as a reference electric potential for ionizer.</td>
</tr>
<tr>
<td>A3</td>
<td>Gray</td>
<td></td>
<td>Maintenance detection signal</td>
<td>IN</td>
<td>Make sure to ground with a ground resistance of 100 Ω or less to use it as a reference electric potential for ionizer.</td>
</tr>
<tr>
<td>B4</td>
<td>Yellow</td>
<td></td>
<td>Maintenance detection signal</td>
<td>OUT/Contact point B</td>
<td>Make sure to ground with a ground resistance of 100 Ω or less to use it as a reference electric potential for ionizer.</td>
</tr>
<tr>
<td>A5</td>
<td>Purple</td>
<td></td>
<td>Error signal</td>
<td>OUT/Contact point B</td>
<td>Make sure to ground with a ground resistance of 100 Ω or less to use it as a reference electric potential for ionizer.</td>
</tr>
<tr>
<td>B5</td>
<td>White</td>
<td></td>
<td>—</td>
<td>—</td>
<td>Make sure to ground with a ground resistance of 100 Ω or less to use it as a reference electric potential for ionizer.</td>
</tr>
</tbody>
</table>

* Confirm the power supply cable dimensions on page 23 for the cable specifications.

#### Frequencies

<table>
<thead>
<tr>
<th>Frequency set Switch set no.</th>
<th>Frequency (Hz), Remote controller</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IZS40</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td>30</td>
</tr>
<tr>
<td>8</td>
<td>DC+</td>
</tr>
<tr>
<td>9</td>
<td>DC−</td>
</tr>
</tbody>
</table>

* Set when remote controller is used.
Wiring Circuit/IZS41, 42

NPN specification

Ionizer (IZS41, 42)

- 24 V Power supply
- 24 VDC
- 0 V

Isolation circuit (Photo coupler)

INPUT

+ 24 V

Isolation circuit (Photo coupler)

OUTPUT

+ 24 V

Isolation circuit (Photo coupler)

F.G.

PLC

+ 24 V

Power supply

24 VDC

+ 24 V

Brown (2 pcs.) + 24 VDC

Blue (2 pcs.) 0 V

Light green

Discharge stop signal

Gray

Maintenance detection signal

Yellow

Maintenance detection signal

Purple

Irregular signal

Shield

Ground with a ground resistance of 100 Ω or less.

PNP specification

Ionizer (IZS41, 42)

- 24 V Power supply
- 24 VDC
- 0 V

Isolation circuit (Photo coupler)

INPUT

+ 24 V

Isolation circuit (Photo coupler)

OUTPUT

+ 24 V

Isolation circuit (Photo coupler)

F.G.

PLC

+ 24 V

Power supply

24 VDC

+ 24 V

Brown (2 pcs.) + 24 VDC

Blue (2 pcs.) 0 V

Light green

Discharge stop signal

Gray

Maintenance detection signal

Yellow

Maintenance detection signal

Purple

Irregular signal

Shield

Ground with a ground resistance of 100 Ω or less.

Wiring Circuit/IZS41, 42

NPN specification

Series IZS40/41/42

19

A

- Ground with a ground resistance of 100 Ω or less.
Ionizer Series IZS40/41/42

Dimensions

Ionizer/IZS40

<table>
<thead>
<tr>
<th>Applicable tube O.D.</th>
<th>A (Number of emitter cartridges)</th>
<th>L Dimension</th>
<th>Part no.</th>
<th>n</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>13</td>
<td>340</td>
<td>IZS40-340</td>
<td>5</td>
<td>340</td>
</tr>
<tr>
<td>08</td>
<td>15</td>
<td>400</td>
<td>IZS40-400</td>
<td>6</td>
<td>400</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
<td>460</td>
<td>IZS40-460</td>
<td>7</td>
<td>460</td>
</tr>
<tr>
<td>06</td>
<td>13</td>
<td>580</td>
<td>IZS40-580</td>
<td>9</td>
<td>580</td>
</tr>
<tr>
<td>08</td>
<td>15</td>
<td>640</td>
<td>IZS40-640</td>
<td>10</td>
<td>640</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
<td>820</td>
<td>IZS40-820</td>
<td>13</td>
<td>820</td>
</tr>
<tr>
<td>13</td>
<td>15</td>
<td>1120</td>
<td>IZS40-1120</td>
<td>18</td>
<td>1120</td>
</tr>
<tr>
<td>16</td>
<td>15</td>
<td>1300</td>
<td>IZS40-1300</td>
<td>21</td>
<td>1300</td>
</tr>
<tr>
<td>18</td>
<td>15</td>
<td>1600</td>
<td>IZS40-1600</td>
<td>26</td>
<td>1600</td>
</tr>
<tr>
<td>19</td>
<td>15</td>
<td>1900</td>
<td>IZS40-1900</td>
<td>31</td>
<td>1900</td>
</tr>
<tr>
<td>20</td>
<td>15</td>
<td>2320</td>
<td>IZS40-2320</td>
<td>38</td>
<td>2320</td>
</tr>
<tr>
<td>21</td>
<td>15</td>
<td>2500</td>
<td>IZS40-2500</td>
<td>41</td>
<td>2500</td>
</tr>
</tbody>
</table>

End bracket/IZS40-BE

Intermediate bracket/IZS40-BM

A-A section
Series IZS40/41/42

Dimensions

Ionizer/IZS41, 42

End bracket/IZS40-BE

Intermediate bracket/IZS40-BM

<table>
<thead>
<tr>
<th>Applicable tube O.D.</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>13</td>
</tr>
<tr>
<td>08</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
</tr>
</tbody>
</table>

n (Number of emitter cartridges), L Dimension

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

**Feedback sensor/IZS31-DF**

**Auto balance sensor [High accuracy type]/IZS31-DG**
Series IZS40/41/42

Dimensions

Power supply cable

IZS40-CP

IZS41-CP

Cable Specifications

<table>
<thead>
<tr>
<th>No. of cable wire/Size</th>
<th>3 cores/AWG24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor Nominal cross section</td>
<td>0.2 mm²</td>
</tr>
<tr>
<td>Outside diameter</td>
<td>0.66 mm</td>
</tr>
<tr>
<td>Insulator Outside diameter</td>
<td>1.0 mm</td>
</tr>
<tr>
<td>Sheath Material Outside diameter</td>
<td>3.8 mm</td>
</tr>
</tbody>
</table>

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>
### Safety Instructions

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.

<table>
<thead>
<tr>
<th>Caution:</th>
<th>Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning:</td>
<td>Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.</td>
</tr>
<tr>
<td>Danger:</td>
<td>Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.</td>
</tr>
</tbody>
</table>

### Safety Precautions

1. **Safety Precautions**

   - **Caution:**
     - Do not service or attempt to remove product and machinery.
     - The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
     - Conditions and environments outside of the given specifications, or use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodic checks to confirm proper operation.

2. **Incorporation and Use Precautions**

   - **Caution:**
     - An application which could have negative effects on people, property, or animals requiring special safety analysis.
     - Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

3. **Precautions for Installation and Use**

   - **Caution:**
     - 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.

4. **Precautions for Maintenance and Disposal**

   - **Caution:**
     - Maintenance and disposal of machinery/equipment should only be performed by an operator who is appropriately trained and experienced.

### 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 malfunction.

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.

### Caution

1. **Safety Precautions**

   - **Caution:**
     - A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. vacuum pads are excluded from this year warranty. 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.

### Warning

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.

### 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.**

   - 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.**

   - Vacuum pads are excluded from this 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.**

### Caution

SMC products are not intended for use as instruments for legal metrology. Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

### Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.
Series IZS40/41/42
Specific Product Precautions 1
Be sure to read this before handling.

![Caution]

**Selection**

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. **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 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. **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 emitters while the ionizer is operating.

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.

**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 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.

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

**Danger High Voltage**

Emitters 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 emitter cartridge or touching the emitter.

7. **Do not affix any tape or seals to the body.**
   
   If a tape or seal contains any conductive adhesive or reflective paint, a dielectric phenomenon may occur due to the generated ions, resulting in electrostatic charge or electric leakage. Avoid using such tape and seals as it will not only cause difficulties in maintaining the performance of the product, but may also result in the failure of the product.

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

**Caution**

1. **Do not install the IZS40/41/42 series in a location where walls or structures are within the range shown in the following figure.**
   
   If structures including walls or conductive items are located close to the unit, the generated ions will not effectively reach the object, and the specification may not be satisfied, or cause failure of the product or electric shock due to dielectricity or electric leakage. Install the product according to the dimensions shown in the following figure, keeping away from structures or conductive items.

---

**Unit: mm**
## Specific Product Precautions 2

**Wiring/Piping**

### Caution

2. After installation, be sure to verify the effects of static neutralization.
   - The effects vary depending on the ambient conditions, operating conditions, etc. After installation, verify the effects of static neutralization.

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. Offset voltage 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.

<table>
<thead>
<tr>
<th>Bar symbol</th>
<th>Power supply cable length: 3 m</th>
<th>Power supply cable length: 10 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar symbol</td>
<td>Transition wiring cable length (same cable length) m</td>
<td>Transition wiring cable length (same cable length) m</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
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</tr>
<tr>
<td>340</td>
<td>1</td>
<td>2</td>
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<tr>
<td>460</td>
<td>1</td>
<td>2</td>
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<tr>
<td>580</td>
<td>1</td>
<td>2</td>
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<tr>
<td>640</td>
<td>1</td>
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<td>820</td>
<td>1</td>
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<td>1120</td>
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<td>2300</td>
<td>1</td>
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<tr>
<td>2500</td>
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Connectable number of ionizers (IZS41) with transition wiring (without external sensor)

<table>
<thead>
<tr>
<th>Bar symbol</th>
<th>Power supply cable length: 3 m</th>
<th>Power supply cable length: 10 m</th>
</tr>
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<td>Transition wiring cable length (same cable length) m</td>
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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: 0 to 40°C for ionizer, 0 to 50°C for feedback sensor and auto balance sensor (high accuracy type), 0 to 40°C for AC adapter, and 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 where static electricity is discharged to the body.
     - e. Avoid using in an area where there is a strong magnetic field or surge.
     - 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 with limited ventilation.
     - h. Avoid using in a place where the temperature is likely to be damaged by lighting.
     - i. Avoid using in an area where static electricity is discharged from the body.
     - j. Avoid using in a place where static electricity is discharged to the body.
     - k. Avoid using in a place where static electricity is discharged from the controller.
     - l. Avoid using in a closed place where the temperature is likely to be damaged by lighting.
     - m. Avoid using in a place where static electricity is discharged from the body.
     - n. Avoid using in a place where static electricity is discharged from the controller.

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. When cleaning the emitter or replacing the emitter cartridge, be sure to turn off the power supply or air supply to the body.
   - If the emitters are touched while the product is energized, this may cause an electric shock or accident.
   - If an attempt to replace the emitter cartridges is performed before removing air supply, the emitter cartridges may eject unexpectedly due to the supply air. Remove air supply before replacing the cartridges. If emitter cartridges are not securely mounted to the bar, they may eject or release when air is supplied to the product. Securely mount or remove the emitter cartridges referencing the instructions shown below.

2. 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.

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

### Handling

**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.

2. **Air Filter/Series AF**
   - Eliminates solid foreign matter such as powder particles in the compressed air.

3. **Mist Separator/Series AFM**
   - Eliminates oil mist which is difficult to eliminate with an air filter.

4. **Digital Flow Switch/Series PF2A**
   - Decreases the air consumption by flow control.

5. **2-Color Display Digital Flow Switch/Series PFM**

6. **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.

7. **2 Port Solenoid Valve/Series VX**

8. **Restrictor/Series AS-X214**
   - Regulates to the appropriate air volume depending upon the installation condition.
   - Decreases the air consumption.

9. **Clean Air Filter/Series SFD**
   - Built-in capillary element nominal filtration rating: 0.01 µm
   - Hollow fiber elements with over 99.99% filtering efficiency do not contaminate work pieces.

*The following is an example. Since the product group differs by application, please contact an SMC sales representative.*
Ionizer Series Variations

Ionizer/Nozzle type Series IZN10
Dust removal and static neutralization by air blow
- Eliminates dust clinging to lamp cover.
- Neutralizing static electricity from IC chip.
- Spot type static neutralization
  - Prevents electrostatic breakdown of electric parts.
  - Prevents detachment failure.
Offset voltage ±10 V (in case of energy saving static neutralization nozzle)

Slim design: Thickness dimension 16 mm

1 Maintenance detector
Always outputs LED display and signal when contamination or wear of the emitter is detected.
Dets optimal maintenance time, reduced labor for maintenance.

2 Built-in high-voltage power supply
Installation of external high-voltage power supply and high-voltage power supply cable are unnecessary.

Ionizer/Fan type Series IZF10
Compact fan type with simple functions
- Compact design: 80 x 110 x 39 mm
- Weight: 280 g
- 2 types of fans available
  - Rapid static neutralizing fan: Discharge time* 1.5 seconds
    (When neutralizing 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 neutralizing fan: 57 dB (A)

Electrostatic Sensor Series IZD10/Electrostatic Sensor Monitor Series IZE11
Electrostatic Sensor Series IZD10
The importance of the static electric control is put on confirming the “actual status”.
- Potential measurement: ±20 kV (detected at a 50 mm distance)
- ±0.4 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 Ω)
- Broadens your coverage of electrostatic potential measurement applications.

Electrostatic Sensor Monitor Series IZE11
- Output: Switch output x 2 + Analog output (1 to 5 V, 4 to 20 mA)
- Minimum unit setting: 0.001 kV (at ±0.4 kV), 0.1 kV (at ±20 kV)
- Display accuracy: ±0.5% F.S., ±1 digit or less
- Detection distance correction function (adjustable in 1 mm increments)
- Supports two types of sensors (±0.4 kV and ±20 kV) through range selection.

Handheld Electrostatic Meter Series IZH10
The importance of the static electric control is put on confirming the “actual status”.
Easy-to-use handheld electrostatic meter
- Measurement range: ±20.0 kV
- Minimum display unit: 0.1 kV (±1.0 to ±20.0 kV)
- 0.01 kV (0 to ±0.99 kV)
- Compact and lightweight: 85 g (excluding dry cell batteries)
- Backlight for reading in the dark
- LOW battery indicator
- Peak/Bottom value indication
- Zero-clear function
- Auto power-off function

Revision history
Edition B - Excerpted from pages 1097 to 1124 of the Best Pneumatics No. 6 (Ver. 5).
RZ