



**Benefits:**

- Reduced production costs
- Improved efficiency in production performance, with increased production speed
- Safety increased, with improved safer machine operation

## SMC Solutions for the measurement, removal and control of static electricity

**Ionizers**

|             |              |
|-------------|--------------|
| Bar Type    | Series IZS31 |
| Nozzle Type | Series IZN10 |
| Fan Type    | Series IZF10 |



## STATIC ELECTRICITY

### ■ How can static electricity affect you?

Static electricity affects most manufacturing processes and it often causes major production issues.

### ■ When should you consider taking steps to eliminate or reduce static?

- When production quality is reduced – often with increased rejection rates
- When operational performance is affected – with decreased production or stoppages
- When machine operators or handlers receive shocks
- When heat generation due to static electricity could cause combustion
- When dust starts to adhere to the workpiece/s
- When difficulties occur whilst separating impurities
- When problems with powder sticking occur during painting processes
- When labels are misaligned – including incorrect or unreadable marking

### ■ Why use ionizers?

- To reduce production costs - less rejections, reduced maintenance and downtime, less material wastage
- To improve efficiency - increased production speed and output
- To improve safety - safer machine operator/handler operation

### ■ What are the next steps?

Factors such as environmental conditions have a dramatic influence on the creation and build-up of static electricity. Static electricity often fluctuates throughout the day and even a small change in temperature or humidity can make a real difference to the levels of generated static.

That is why SMC recommends the following actions:

- **Measurement** - to check and quantify the levels of generated static electricity
- **Removal** - to help avoid the production problems due to static electricity
- **Control** - to continually monitor the levels of static electricity for any change so that preventative measure can be taken

## IONIZERS IN THE MARKET

### ■ What is the difference between the different ionizer types?

- **Bar type** - suitable for electrostatic removal from a flat surface – also, by using compressed air, electrostatic removal can be achieved from an increased distance from the workpiece
- **Nozzle type** - suitable for partial electrostatic removal of a small workpiece or total electrostatic removal in a small space. Also used to remove dust, with a high flow rate type
- **Fan type** - suitable for electrostatic removal in the atmosphere around workpieces. As the fan type requires no air supply it's suitable for use in a wide range of applications and locations
- **Gun type** - a combined air gun and ionizer which is particularly suitable for removing dust adherence caused by static electricity

### ■ When and where to use each type?

- **Bar and fan types**
  - To stop workpieces from clinging due to static electricity
  - To prevent circuit boards from being damaged by static electricity
  - To eliminate uneven painting due to static electricity
- **Nozzle and gun types**
  - To prevent short circuiting due to dust
  - To remove dust adhered to moldings
  - To eliminate static electricity in confined areas using low pressure

## Bar Type Ionizer Series IZS31



- Ion generation technology: sensing DC, pulsed DC or DC modes
- Easy maintenance individual removable electrodes:
  - low maintenance
  - fast elimination of static electricity
- Two types of compact sensors are available:
  - autobalance sensor
  - feedback sensor
- Ionic balance  $\pm 30V$
- Elimination of static electricity in fractions of second
- Aerodynamic cross section
- Controller integrated in the bar
- Low electrical consumption
- Lengths of bar available from 300 to 2300 mm
- Adjustable frequency ranges (until 60 Hz)
- Display and warning alarms
- Using compressed air allows the elimination of static at distances of up to 2 metres

| Part number | Bar length [mm] | Output | Electrode needle material | Electrode cartridge                          | Sensor                                |
|-------------|-----------------|--------|---------------------------|--|---------------------------------------|
| IZS31-300P  | 300             | PNP    | Tungsten (standard)       | With rapid elimination of static electricity | Without feedback / autobalance sensor |
| IZS31-380P  | 380             |        |                           |  |                                       |
| IZS31-620P  | 620             |        |                           |  |                                       |
| IZS31-780P  | 780             |        |                           |  |                                       |
| IZS31-1100P | 1100            |        |                           |  |                                       |
| IZS31-1260P | 1260            |        |                           |  |                                       |
| IZS31-1500P | 1500            |        |                           |  |                                       |
| IZS31-1900P | 1900            |        |                           |  |                                       |
| IZS31-2300P | 2300            |        |                           |  |                                       |

\* Power supply cable (3 m) included.

\* Sensor and brackets not included in part numbers listed above. Please order them separately.

\* For a different electrode cartridge and/or electrode needle material, please order separately.

\* NPN option available upon request.

\* Non-standard bar length (80mm pitch) available upon request, with -X10 option.

### Option / Accessories

| Part number     | Description                        |  |                              |
|-----------------|------------------------------------|--|------------------------------|
| IZS31-FP-X196EU | AC adapter (100 to 240 VAC)        |  |                              |
| IZS31-CP        | Power supply cable                 | 3 m  |                              |
| IZS31-CPZ       |                                    | 10 m   |                              |
| IZS31-NT        | Electrode cartridge                | With rapid elimination of static electricity | Material: tungsten           |
| IZS31-NS        |                                    |  | Material: stainless steel    |
| IZS31-NC        |                                    |  | Material: silicon            |
| IZS31-NJ        |                                    | With low maintenance                         | Material: tungsten           |
| IZS31-NK        |                                    |  | Material: silicon            |
| IZS31-DE        | Sensor                             | Autobalance sensor [body-mounting type]      |                              |
| IZS31-DG        |                                    | Autobalance sensor [high-precision type]     |                              |
| IZS31-DF        |                                    | Feedback sensor                              |                              |
| IZS31-BE        | Bracket                            | End bracket                                  |                              |
| IZS31-BM        |                                    | Centre bracket                               |                              |
| IZS31-E3        | Electrode cartridge security cover |  | 3 fixed electrode cartridges |

Feedback sensor



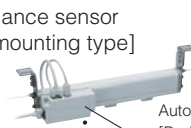
- Rapid elimination of static electricity by a feedback sensor
- Detect the polarity of a discharged object and measure the charged tension

Autobalance sensor  
[High-precision type]



- Reduction in adjustment and maintenance man-hours
- The ion balance near the workpiece is accurately adjusted
- The object is not affected by the height of installation or any interference

Autobalance sensor  
[Body-mounting type]



- Autobalance sensor [Body-mounting type] can be mounted on the body, and can be installed in any place

## Nozzle Type Ionizer Series IZN10



- Ionic balance  $\pm 15 V$  ( $\pm 10 V$  with energy saving nozzle)
- Compact: high voltage source integrated in the body
- 2 types of nozzle to adapt several applications:
  - energy saving static electricity elimination nozzle
  - high flow rate nozzle
- Slim design
- Easy maintenance: possibility of cleaning electrode without losing the assembly angle
- External switch input function (2 inputs)
- Dirt alarm in electrode

| Part number | Nozzle type   | Port size      | Output |
|-------------|---|----------------|--------|
| IZN10-01P06 | Energy saving static electricity elimination nozzle | ø6 metric size | PNP    |
| IZN10-02P06 | High flow rate nozzle                               |                |        |
| IZN10-11P06 | Female threads for piping (Rc1/8)                   |                |        |

\* Power supply cable (3 m) included.

\* Brackets and electrode needle assembly not included in part numbers listed above. Please order them separately.

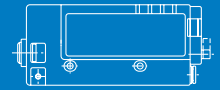
\* NPN option available upon request.

\* IZN10-11P06 is used with a fitting and a tube on the end.

### Option / Accessories

| Part number     | Description                 |                           |      |
|-----------------|-----------------------------|---------------------------|------|
| IZN10-FP-X196EU | AC adapter (100 to 240 VAC) |                           |      |
| IZN10-B1        | Bracket                     | L-Bracket                 |      |
| IZN10-B2        |                             | Pivoting bracket          |      |
| IZN10-B3        |                             | Din rail mounting bracket |      |
| IZN10-CP        | Power supply cable          |                           | 3 m  |
| IZN10-CPZ       |                             |                           | 10 m |
| IZN10-NT        | Electrode needle assembly   |                           |      |





## Fan Type Ionizer Series IZF10



- Ionic balance  $\pm 13$  V
- Compact design and lightweight
- Two types available:
  - fast deionizing type: 1.5 seconds deionizing time
  - low noise type: 29 dB(A)
- Alarm functions: high-voltage error, electrode needle contamination detector

| Part number | Nozzle type           | Air flow                 |
|-------------|-----------------------|--------------------------|
| IZF10-P     | Rapid deionizing type | 0.66 m <sup>3</sup> /min |
| IZF10-LP    | Low noise type        | 0.46 m <sup>3</sup> /min |

\* Power supply cable (3 m) included.

\* AC adapter and e-con connector not included. Please order them separately.

### Option / Accessories

| Part number | Description                        |
|-------------|------------------------------------|
| IZF10-CP    | Power supply cable (3 m)           |
| IZF10-CPZ   | Power supply cable (10 m)          |
| IZF10-CG2EU | Power supply cable with AC adapter |
| IZF10-B1    | Bracket                            |
| IZF10-A1    | Cartridge case                     |

## Electrostatic Sensor Series IZD10



- Potential measurement:  $\pm 20$  kV (detected at a 50 mm distance),  $\pm 0.4$  kV (detected at a 25 mm distance)
- Analogue output: the measured electrostatic potential is converted into a 1 to 5 V output that can be used with the electrostatic monitor IZE11
- Small and easy to mount

| Part number | Potential measurement | Output voltage |
|-------------|-----------------------|----------------|
| IZD10-110   | $\pm 0.4$ kV          | 1 to 5 v       |
| IZD10-510   | $\pm 20$ kV           |                |

## Electrostatic Monitor Series IZE11



- Electrostatic sensor (IZD10) monitor
- Output: 2 switch output + analogue output (1 to 5 V, 4 to 20 mA)
- Supports two types of sensors:  $\pm 0.4$  kV and  $\pm 20$  kV
- Two colour display (red and green)
- Minimum unit setting: 0.001 kV (at  $\pm 0.4$  kV), 0.1 kV (at  $\pm 20$  kV)
- Display accuracy:  $\pm 0.5\%$
- Connection by connector:
  - connector for power supply / output
  - e-con connector: connector to sensor

| Part number | Input / output                                   |
|-------------|--|
| IZE112-LC   | 2 x PNP open collector + analogue output 1-5 V   |
| IZE113-LC   | 2 x PNP open collector + analogue output 4-20 mA |

\* Provided with both connector cable for power supply/output and connector for sensor connection.

### Option / Accessories

| Part number | Description                                   |
|-------------|---|
| ZS-28-A     | Connector cable for power supply/output (2 m) |
| ZS-28-B     | Bracket                                       |
| ZS-28-C     | Connector for sensor connection               |
| ZS-27-C     | Panel mount adapter                           |
| ZS-27-D     | Panel mount adapter + front protective cover  |

## Handheld Electrostatic Meter Series IZH10



- Portable sensor that detects the electrostatic potential of an object and outputs a digital readout
- Compact and lightweight
- Rated charge amount range:  $\pm 20.0$  kV
- Functions:
  - peak & bottom display function
  - zero clear function
  - battery indicator
  - backlight display

| Part number | Option                        |
|-------------|-------------------------------|
| IZH10       | None                          |
| IZH10-H     | High-voltage measuring handle |

### Option / Accessories

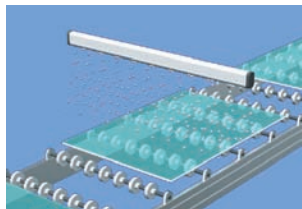
| Part number | Description                   |
|-------------|-------------------------------|
| IZH-A-01    | Ground wire (1.5m)            |
| IZH-B-01    | Soft case                     |
| IZH-C-01    | High-voltage measuring handle |

\* IZH-B-01 and IZH-A-01 already attached to the IZH series.

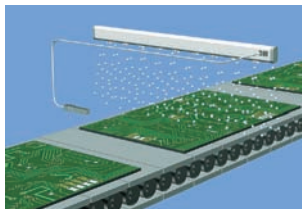
## Applications

Several industries are affected by static electricity in their processes which causes problems such as product defects and reduction in productivity. The customer can select the proper Ionizer based on energy saving or static removal features. Specific applications:

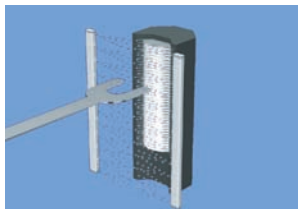
### Bar Type Ionizer Applications



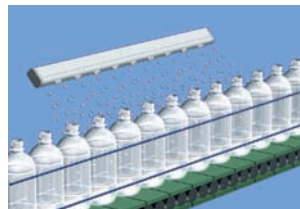
Eliminating static electricity on a glass substrate



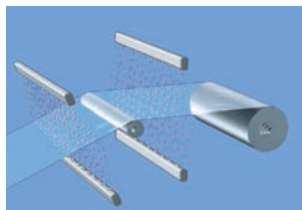
Eliminating static electricity on an electric substrate



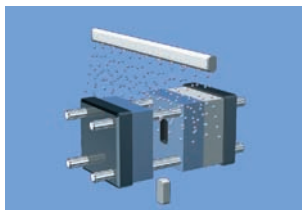
Eliminating static electricity during wafer transfer



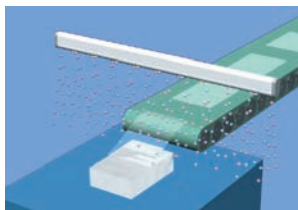
Eliminating static electricity on PET bottles



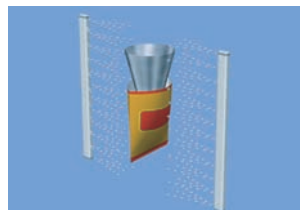
Eliminating static electricity on a film



Eliminating static electricity on molded goods



Eliminating static electricity on film molded goods

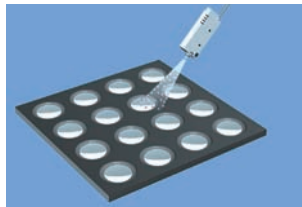


Eliminating static electricity from packing films

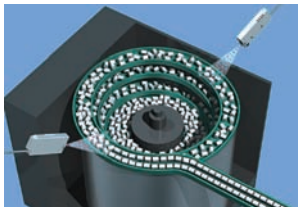
### Nozzle Type Ionizer Applications



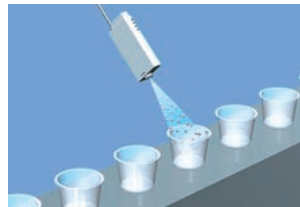
Eliminating static electricity from an IC chip



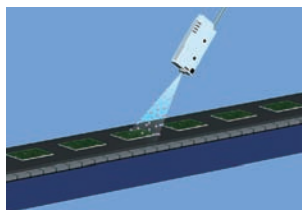
Eliminating static electricity from lenses



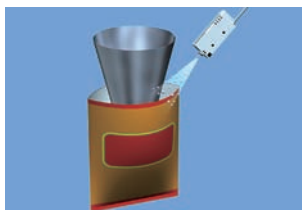
Eliminating static electricity from parts feeders



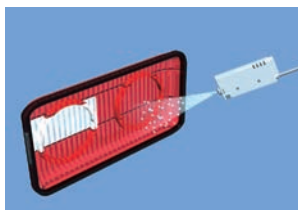
Eliminating static electricity from plastic cups



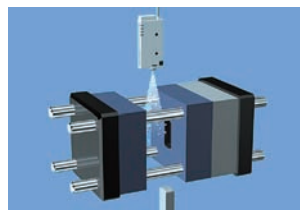
Eliminating static electricity from an electric substrate



Eliminating static electricity from packing films



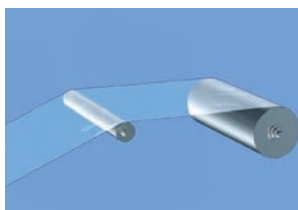
Eliminating dust clinging to lamp covers



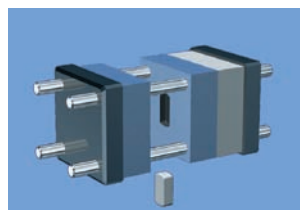
Eliminating static electricity from molded goods

### Fan Type Ionizer Applications

Static electricity removal from charged atmospheres, in places where an air supply is not available but it is still needed to dissipate static electricity.



Eliminating static electricity for preventing sticking of dust to a roll film

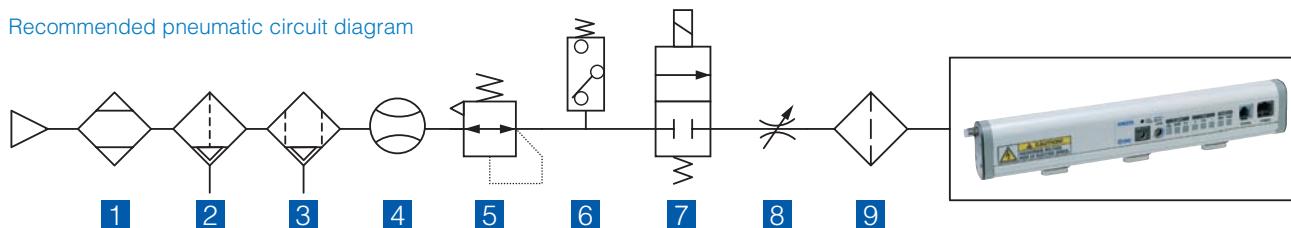


Eliminating static electricity on resin molded goods

## Related products.....

SMC can provide all the equipment required to supply air to the Ionizer. By using the equipment as shown below you can decrease maintenance, prevent damage and also enjoy energy saving.

### 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/PF2M



Decreases air consumption with flow control.

#### 5 Regulator / Series AR



Decreases air consumption by setting to an appropriate pressure.

#### 6 Digital Pressure Switch / Series ISE30A



Pressure control prevents the static electricity removal performance from being reduced in accordance with the reduction of air pressure.

#### 7 2 Port Solenoid Valve / Series VCA



#### 8 Speed Controller / Series AS-X214



Regulates to the appropriate air volume depending on the installation conditions. Decreases 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 workpieces.

## Additional products.....

### Fittings

- Series KA Antistatic one-touch fittings



### Tubing

- Series TAS/TAU Antistatic tubing
- Series TAU-X100 Antistatic coloured tubing



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