

Ionizer

Series IZS31

- **Rapid elimination of static electricity by a feedback sensor: 0.3 seconds**

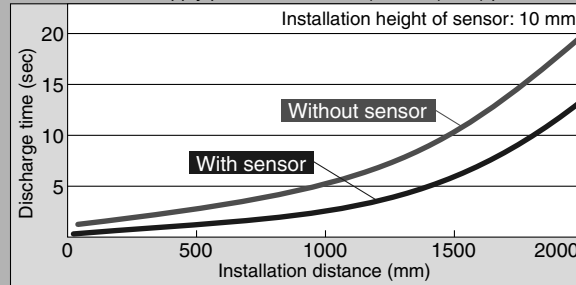
Conditions / Static buildup decreased from 1000 V to 100 V

Discharged object: Charged plate monitor (150 mm x 150 mm, capacitance 20 pF)

Installation distance: 200 mm (Tungsten electrode with air purge)

Continuously emits ions in accordance with the polarity applied onto a workpiece.

Supply pressure: 0.1 MPa (7 l/min (ANR) per nozzle)



<Conditions> 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, 1-2000). Use this as a guideline purpose only for model selection because the value varies depending on the material and/or size of a subject.

- **Ion balance control by an autobalance sensor**



IZS

IZD
IZE

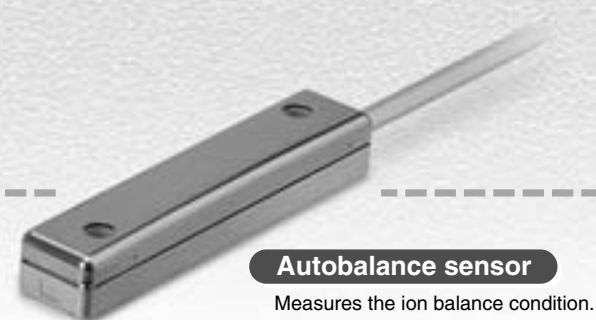
IZH

Controlled ion balance by sensor



Rapid elimination of static electricity using a feedback sensor

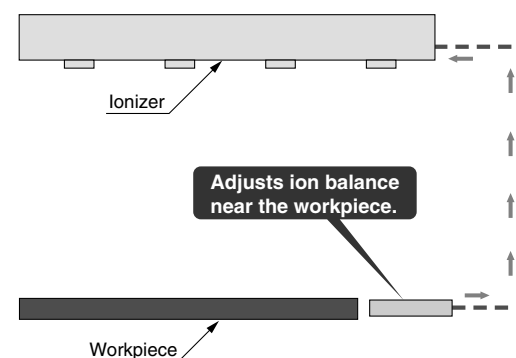
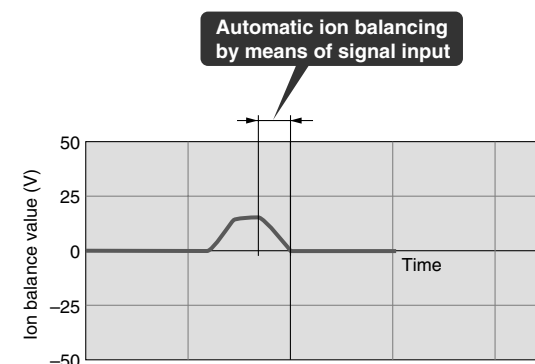
Reduction in ion balance adjustment man-hours using an autobalance sensor



Automatic ion balance adjustment and reduction in ion balance adjustment man-hours using an autobalance sensor

In the pulse DC mode, the ion balance can be automatically adjusted using an autobalance sensor.

The object is not affected by the height of installation or any disturbance interference since the ionizer is designed to adjust the ion balance near the autobalance sensor.

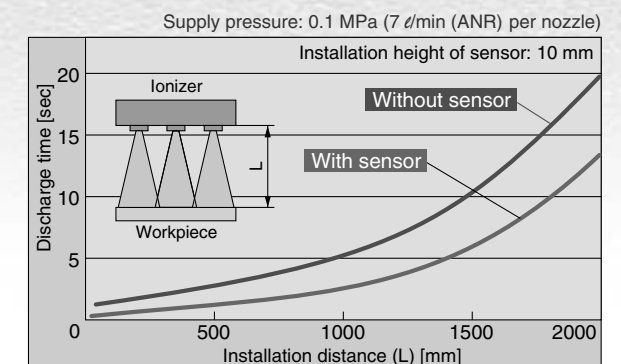
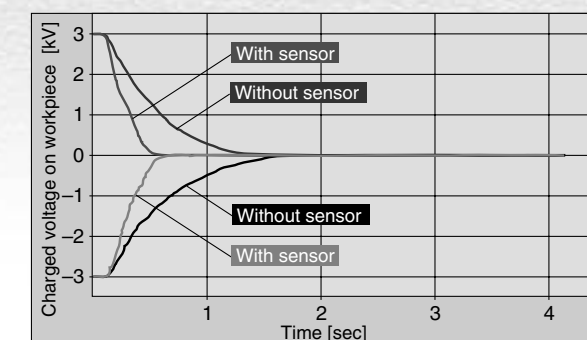


- The autobalance sensor may be connected only when adjusting the ion balance.



Rapid elimination of static electricity using a feedback sensor

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

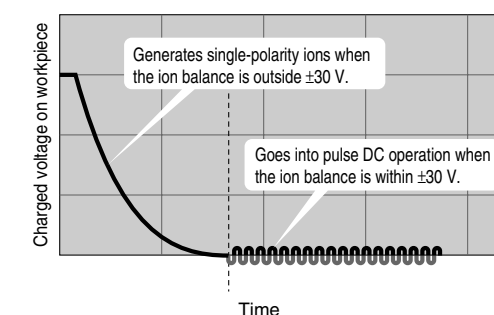


- Operation mode after static electricity removal (ion balance: within ± 30 V) can be selected.

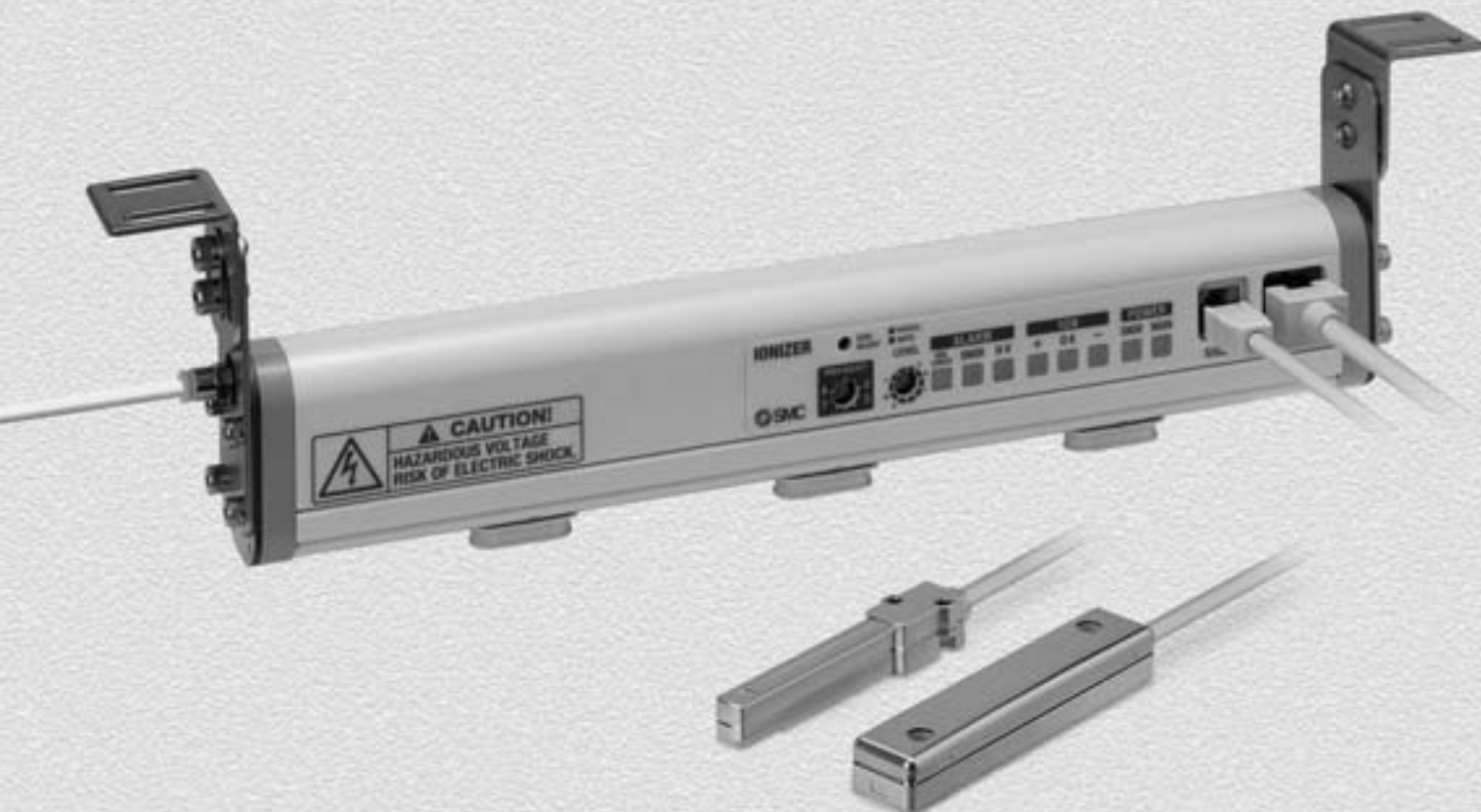
Energy saving run mode: Stops generating ions after static electricity removal to reduce power consumption. Air consumption can also be reduced by controlling the pneumatic valve with a static electricity removal completion signal.

Note) The pneumatic valve must separately be procured.

Continuous static electricity removal run mode: After static electricity removal, the ionizer changes to pulse DC operation and continues to remove static electricity to make it approach 0 V even if the ion balance is below 30 V.

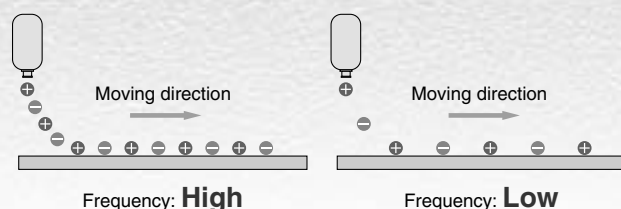


Mode	Ion emission waveform
Sensing DC	+
Energy saving run	-
Sensing DC	+
Continuous static electricity removal run	-
Pulse DC	+
+ charged image	-



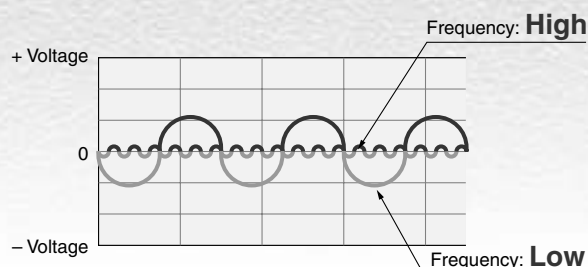
Capable of handling workpieces moving at high speed

- Switching over frequency: Max 60 Hz
Ions are discharged at high density at workpieces moving at high speed.



This reduces the range of surface potential fluctuations for short installation distances after static electricity removal.

Note) The range of surface potential fluctuations varies depending on the object's material, etc.



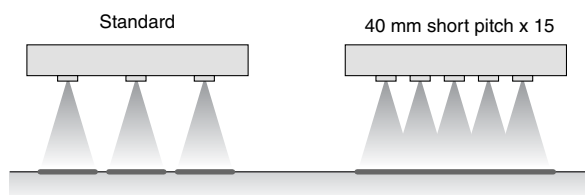
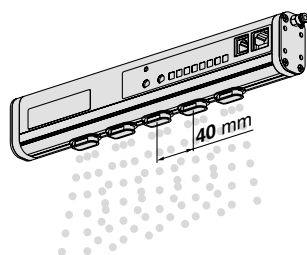
Effective on short-distance static electricity removal

- Prevention of static electricity removal irregularities

Electrode cartridge 40 mm-pitch: **-X15**

(Standard: 80 mm-pitch) (Supported length: 1260 mm or less)

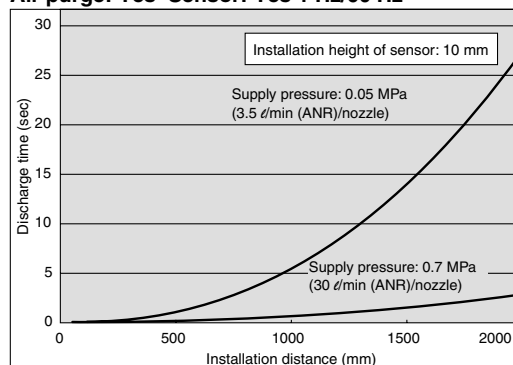
Note) Air purge nozzles are arranged at an 80 mm-pitch.



Compatible with purge pressures of 0.7 MPa

- Effective for blowing away foreign particles during long-distance static electricity removal

Air purge: Yes Sensor: Yes 1 Hz/60 Hz



DC mode: using the frequency trimmer setting, fix at desired polarity for repeated discharge.

- Can be used to remove static electricity from fast-charged or high-potential workpieces or to electrostatically charge them.

Enhanced display functions

- “Visualization” of charging condition
(During sensing DC mode)

Workpiece electric charge polarity	LED + OK -	Workpiece electric charge voltage	
Positive	■	+400 V or higher	■ Light ON
	■	+100 V to +400 V	■ Blinking at 4 Hz
	■	+30 V to +100 V	■ Light OFF
Static electricity removal completed	■	Within ±30 V	
	■	-30 V to -100 V	
	■	-100 V to -400 V	
Negative	■	-400 V or lower	

- “Visualization” of ion balance
(When pulse DC mode or autobalance sensor are used.)



Simultaneously checks for dirt buildup on the electrode needle

Light ON: ±30 V or less
Blinking: Approx. ±30 V
Light OFF + Alarm output: Not adjustable

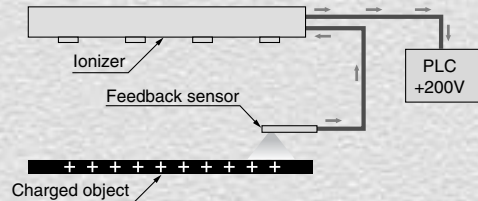
Option

- 3 types electrode needle material
- Tungsten (Ion balance: ±30 V)
- Monocrystal silicon
(Ion balance: ±30 V Applicable to environments sensitive to metal contamination)
- Stainless steel (Ion balance: ±100 V)
- Non-standard bar length compliant:
IZS31-□□□-X10
(Made to order)

Standard	300, 380, 620, 780, 1100, 1260, 1500, 1900, 2300
-X10	460, 540, 700, 860, 940, 1020, 1180, 1340, 1420, 1580, 1660, 1740, 1820, 1980, 2060, 2140, 2220

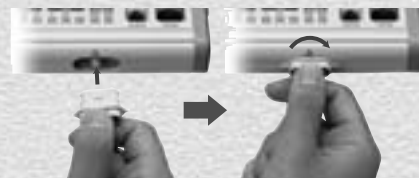
Detects the electric potential difference and outputs in an analog voltage. (During sensing DC mode)

- Outputs measured data at a 1 to 5 V level when a feedback sensor is used. By outputting the data to a PLC, etc., it is possible to control static electricity.



Safety functions

- Electrode cartridge drop prevention
Locking by double-action



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



When attached to the main unit

Related Equipment

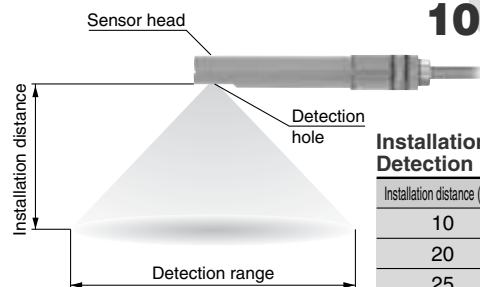
Electrostatic Sensor / Series IZD10

Enables the “visualization” of static electricity.



- Analog output: **1 to 5 V**
- Potential measurement: **±20 kV** (detected at a **50 mm** distance)
±0.4 kV (detected at a **25 mm** distance)
- Dimensions: **17 mm x 13 mm x 88 mm**
- Measurement range

Installation distance
10 to 50 mm



Installation Distance and Detection Range

Installation distance (mm)	Detection range (mm)
10	45
20	85
25	100
30	120
40	150
50	180

Electrostatic Sensor Monitor / Series IZE11

Receives an output from the IZD10 electrostatic sensor to digitally display the electrostatic potential.

- 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

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**)



IZS

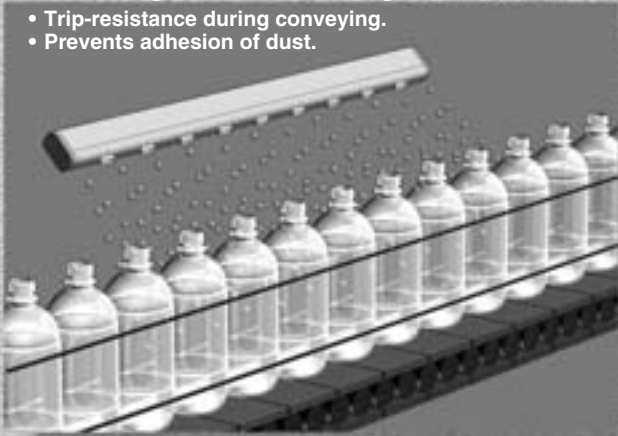
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Application Examples

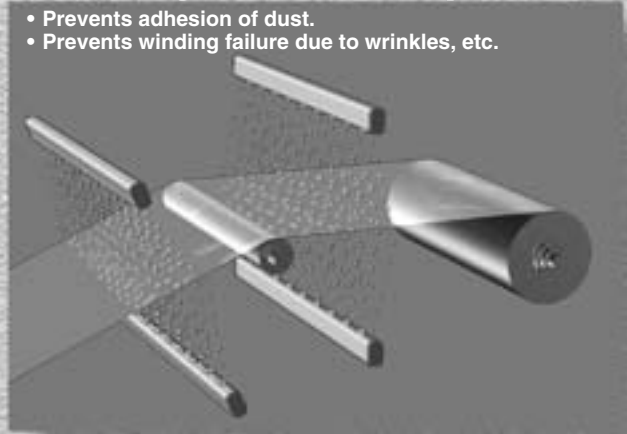
Eliminating static electricity on PET bottles

- Trip-resistance during conveying.
- Prevents adhesion of dust.



Eliminating static electricity on a film

- Prevents adhesion of dust.
- Prevents winding failure due to wrinkles, etc.



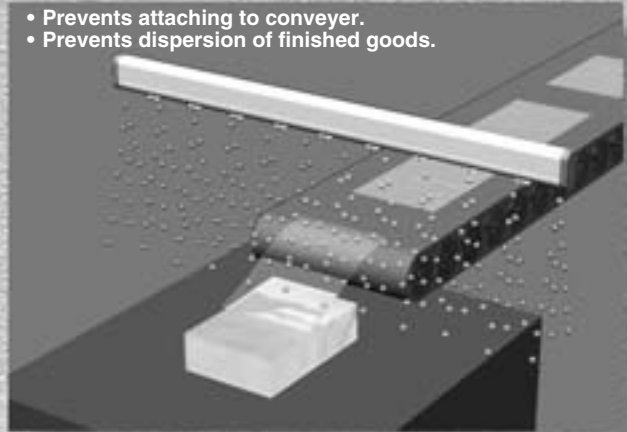
Eliminating static electricity on mold goods

- Improves detachability of mold goods from a die.



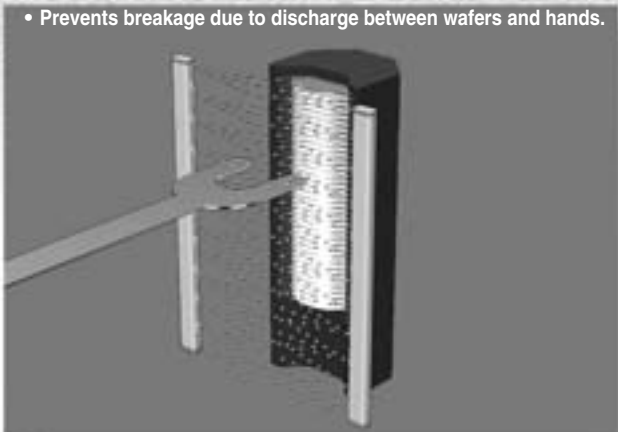
Eliminating static electricity on film mold goods

- Prevents attaching to conveyer.
- Prevents dispersion of finished goods.



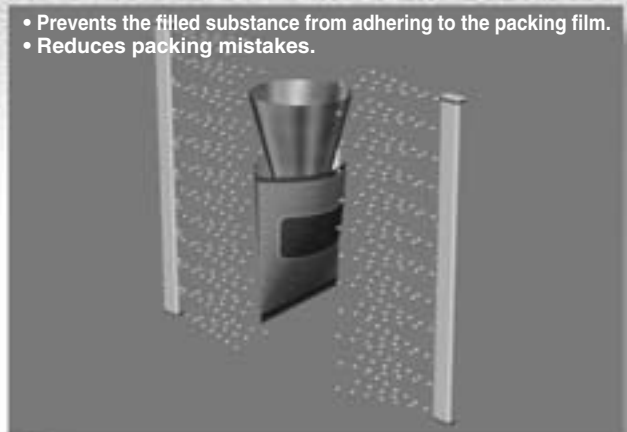
Eliminating static electricity wafer transfer

- Prevents breakage due to discharge between wafers and hands.



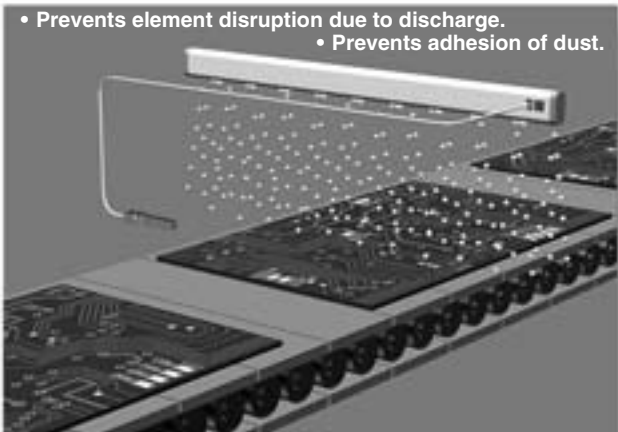
Removal of static electricity from packing films

- Prevents the filled substance from adhering to the packing film.
- Reduces packing mistakes.



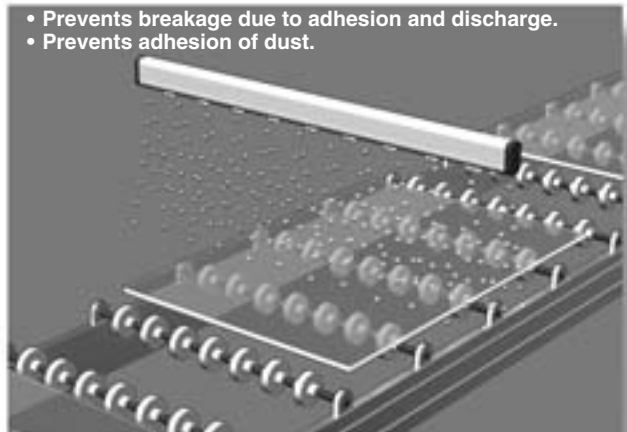
Eliminating static electricity on an electric substrate

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



Eliminating static electricity on a glass substrate

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



Series IZS31

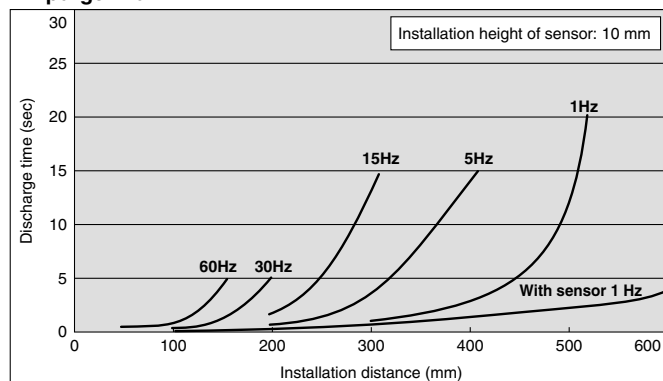
Technical Data 1

Electricity Removal Characteristics

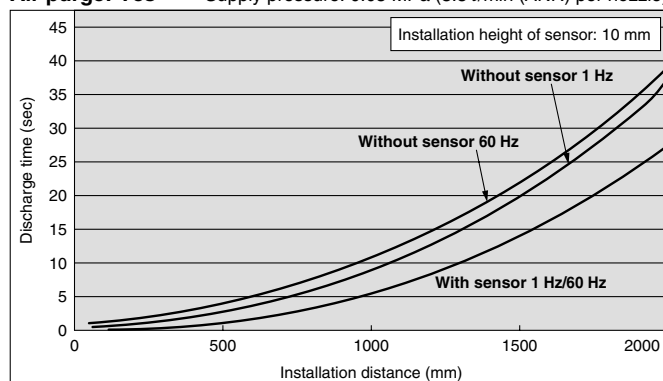
Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3, 1-2000). Use this as a guideline purpose only for model selection because the value varies depending on the material and/or size of a subject.

1) Installation distance and discharge time (Discharge time from 1000 V to 100 V)

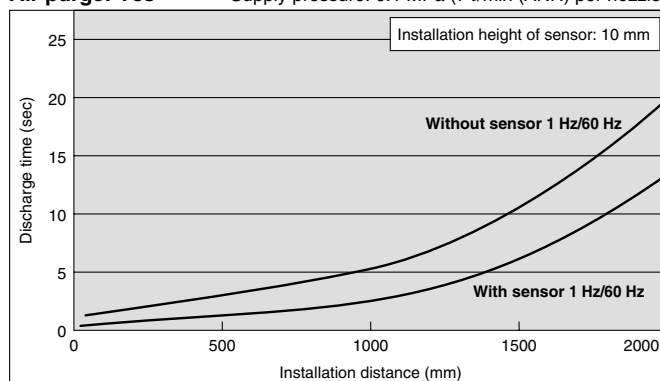
Air purge: No



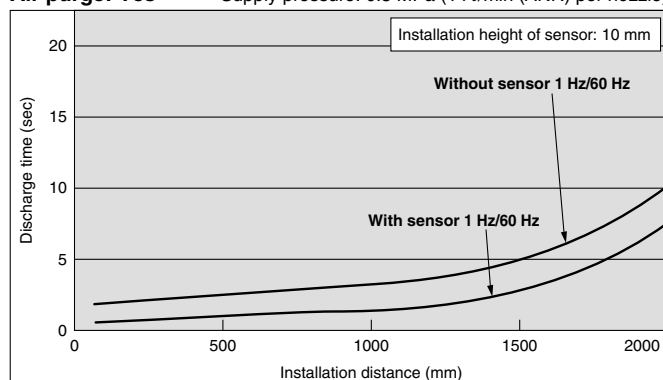
Air purge: Yes Supply pressure: 0.05 MPa (3.5 ℓ /min (ANR) per nozzle)



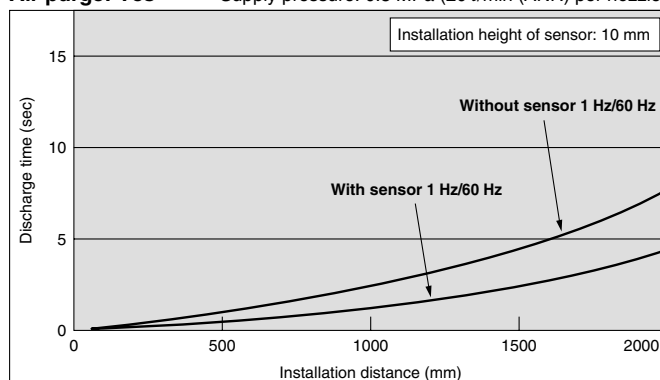
Air purge: Yes Supply pressure: 0.1 MPa (7 ℓ /min (ANR) per nozzle)



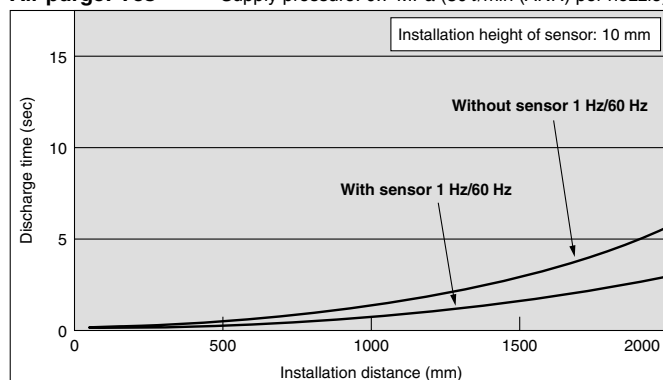
Air purge: Yes Supply pressure: 0.3 MPa (14 ℓ /min (ANR) per nozzle)



Air purge: Yes Supply pressure: 0.5 MPa (20 ℓ /min (ANR) per nozzle)



Air purge: Yes Supply pressure: 0.7 MPa (30 ℓ /min (ANR) per nozzle)



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Series IZS31

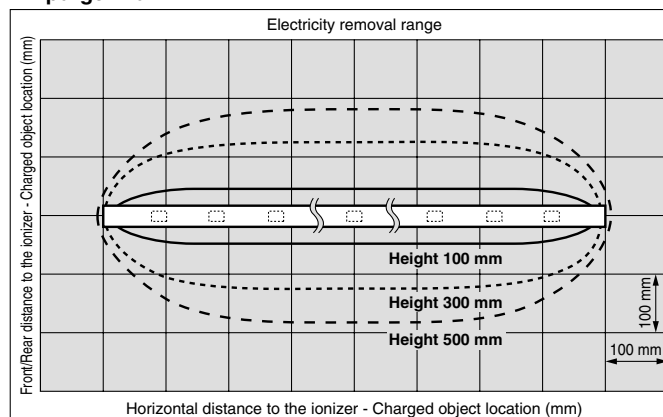
Technical Data 2

Electricity Removal Characteristics

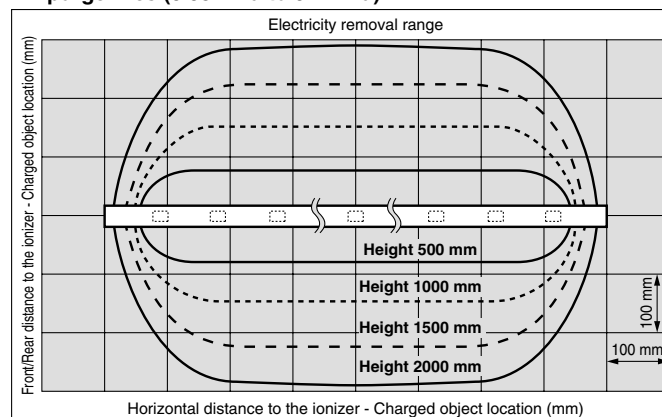
Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3, 1-2000). Use this as a guideline purpose only for model selection because the value varies depending on the material and/or size of a subject.

2) Electricity removal range

Air purge: No

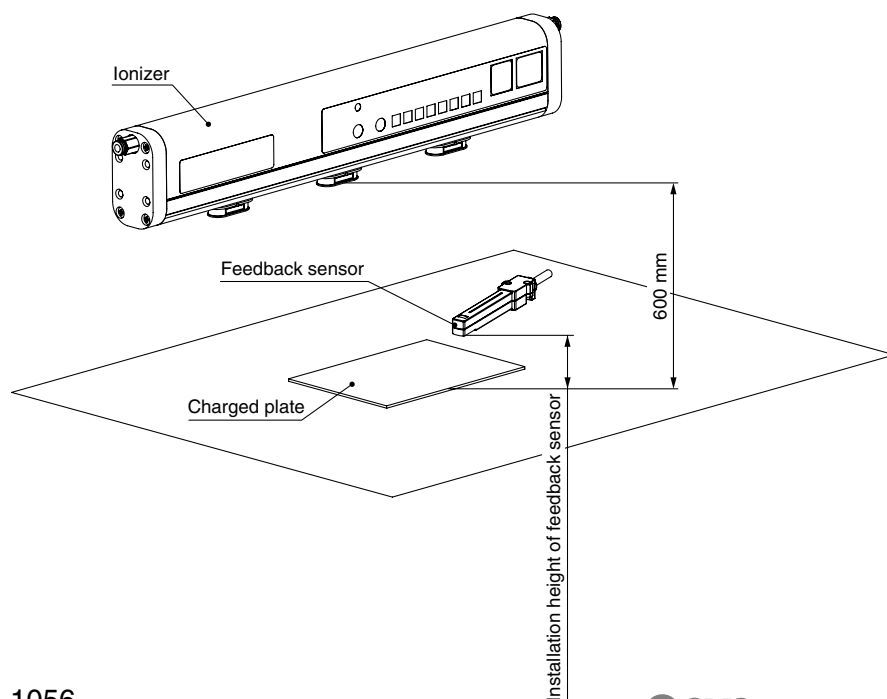
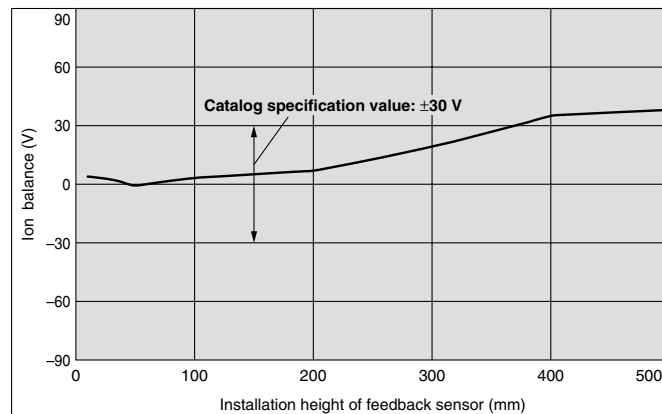
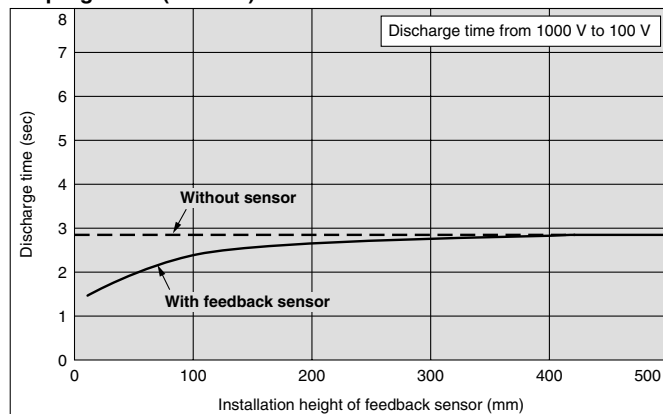


Air purge: Yes (0.05 MPa to 0.7 MPa)



3) Installation height of feedback sensor and discharge time / Ion balance

Air purge: Yes (0.1 MPa)



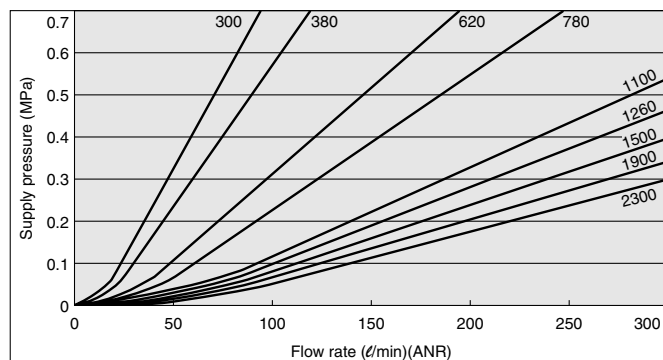
Series IZS31

Technical Data 3

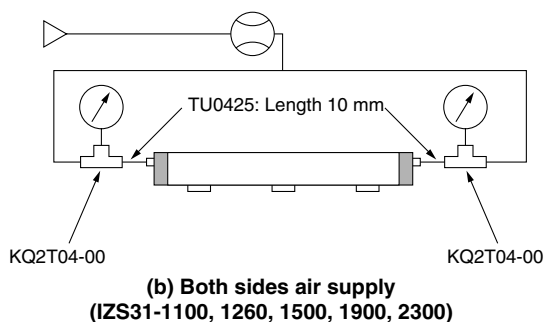
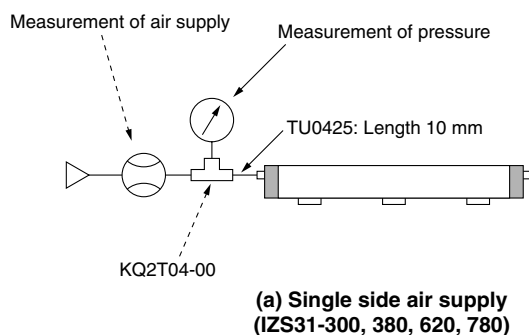
Electricity Removal Characteristics

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, 1-2000). Use this as a guideline purpose only for model selection because the value varies depending on the material and/or size of a subject.

4) Flow rate — pressure characteristics

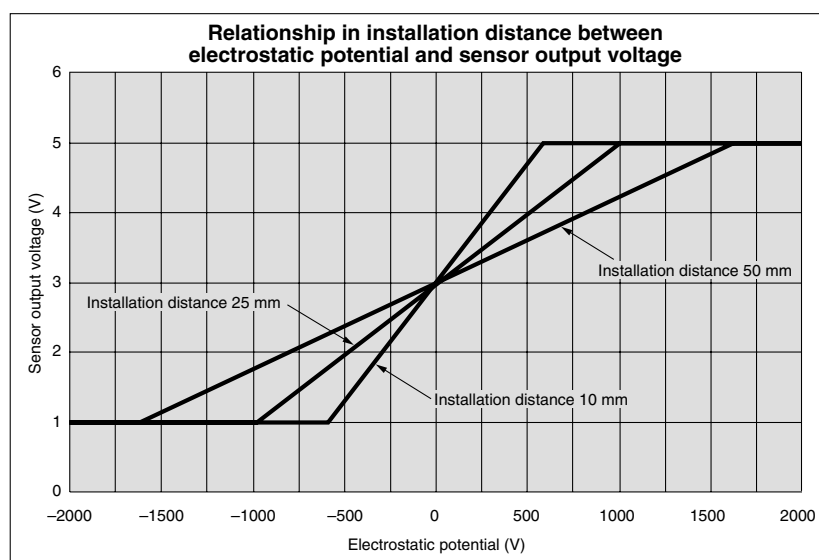


How to measure



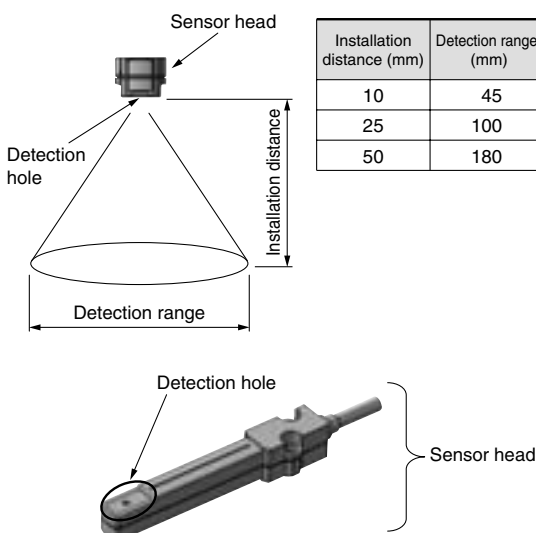
Sensor Monitor Output (When feedback sensor is used)

Note) The installation distance in the figure refers to the distance from the object being submitted to static electricity removal to the electrostatic sensor.



Feedback sensor detection range

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



Ionizer

Series IZS31

How to Order



Ionizer

IZS31 - 780

Bar type

Bar length

Symbol	Bar length
300	300 mm
380	380 mm
620	620 mm
780	780 mm
1100	1100 mm
1260	1260 mm
1500	1500 mm
1900	1900 mm
2300	2300 mm

Electrode needle material

Nil	Tungsten
C	Silicon
S	Stainless steel

Output

Nil	NPN output
P	PNP output

Power supply cable

Nil	With power supply cable (3 m)
Z	With power supply cable (10 m)
N	None

Made to Order

Refer to the below table.

Sensor

Nil	Without sensor
F	With feedback sensor
G	With autobalance sensor

Bracket
(End bracket, Center bracket)

Nil	Without bracket
B	With bracket <small>Note)</small>

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

Number of brackets

Bar length (mm)	End bracket	Center bracket
300, 380, 620, 780	With 2 pcs.	None
1100, 1260, 1500		With 1 pc.
1900, 2300		With 2 pcs.

Made to Order (Refer to pages 1077 and 1078 for details.)

Ionizer / Series IZS31

Symbol	Contents	Specifications
X10	Non-standard bar length compliant (80 mm-pitch)	460, 540, 700, 860, 940, 1020, 1180, 1340, 1420, 1580, 1660, 1740, 1820, 1980, 2060, 2140, 2220
X14	Model with electrode cartridge security cover	The main unit is shipped fitted with an electrode cartridge security cover available as an option.
X15	Model with 40 mm-pitch electrode cartridges	This model comes fitted with electrode cartridges arranged at a 40 mm-pitch (standard pitch: 80 mm). <small>Note)</small> Maximum bar length is 1260 mm. The air purge nozzles are arranged at an 80 mm-pitch.

Power supply cable

How to Order	Contents / Specifications										
<p>IZS31 - CP - X13</p> <p>Power supply cable full length</p> <table> <tr> <th>Symbol</th><th>Cable full length</th></tr> <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> </table>	Symbol	Cable full length	01	1 m	02	2 m	19	19 m	20	20 m	<p>Model with made-to-order power supply cable Available in 1 m increments from 1 m to 20 m.</p> <p>Note 1) 11 mm or longer power supply cables are not CE Marking-compliant. Note 2) Use standard power supply cables for 3 m and 10 m lengths.</p>
Symbol	Cable full length										
01	1 m										
02	2 m										
19	19 m										
20	20 m										

Special Individual Specifications (Contact an SMC sales representative.)

· Change in the direction of access to power supply cable
The direction of access to the power supply cable is changed to the right-hand side of the main unit.
Note) The power supply cable is connected directly to the main unit. A connector is not used.

Accessories

Feedback sensor / IZS31-DF



Autobalance sensor / IZS31-DG



Power supply cable

- IZS31-CP (3 m)
- IZS31-CPZ (10 m)



Electrode cartridge

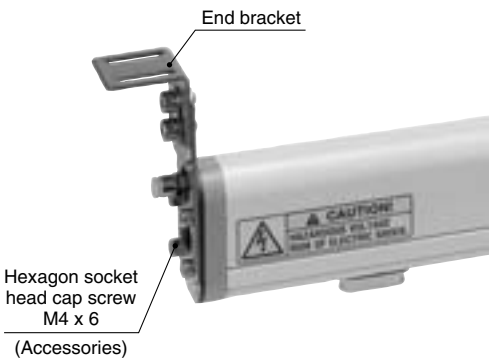
- IZS31-NT (Material: Tungsten)
- IZS31-NC (Material: Silicon)
- IZS31-NS (Material: Stainless steel)



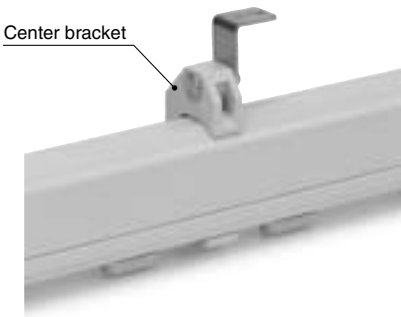
Bracket

Note) The model number is for a single bracket.

End bracket / IZS31-BE



Center bracket / IZS31-BM



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

Bar length (mm)	Quantity	
	End bracket	Center bracket
300, 380, 620, 780	2 pcs.	None
1100, 1260, 1500		With 1 pc.
1900, 2300		With 2 pcs.

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Series IZS31

Option

Electrode cartridge security cover

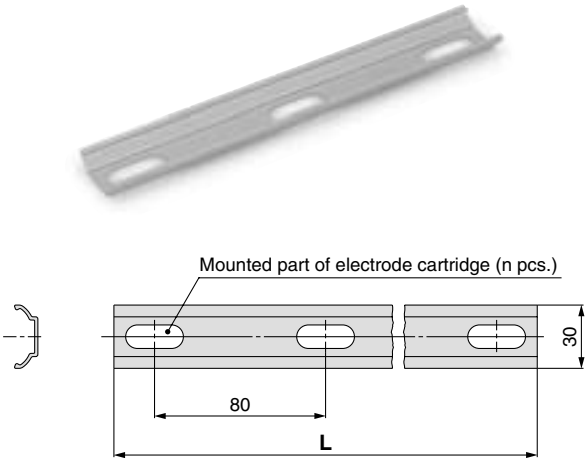
IZS31 – E 3

● Number of fixed electrode cartridges

IZS31-E3	3
IZS31-E4	4
IZS31-E5	5

Number of required security covers

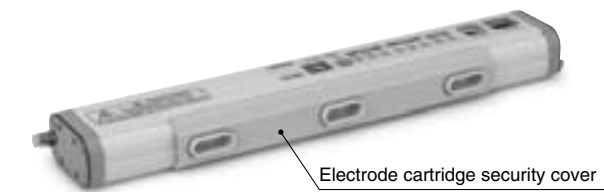
Bar length (mm)	Number of required security covers		
	IZS31-E3	IZS31-E4	IZS31-E5
300	1	—	—
380	—	1	—
620	1	1	—
780	—	1	1
1100	3	1	—
1260	1	3	—
1500	—	2	2
1900	1	5	—
2300	—	2	4



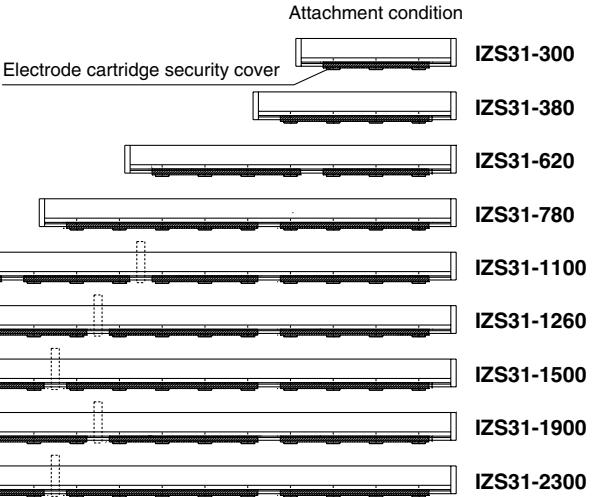
Part no	L
IZS31-E3	200
IZS31-E4	280
IZS31-E5	360

The model number requires the suffix “-X14” to indicate that the main unit is to be shipped fitted with an electrode cartridge security cover.

IZS31 Standard part no. – X14



When attached to the main unit



Driver for ion balance adjustment trimmer / IZS30-M1

Electrode needle cleaning kit / IZS30-M2



Specifications

Ionizer model		IZS31-□□ (NPN specification)	IZS31-□□P (PNP specification)
Ion generation method		Corona discharge type	
Method of applying voltage		Sensing DC, Pulse DC, DC	
Output for emitting electricity		±7000 V	
Ion balance <small>Note 1)</small>		±30 V (Stainless electrode needle: ±100 V)	
Air purge	Fluid	Air (Clean and dry)	
	Operating pressure	0.7 MPa or less	
	Connecting tubing O.D.	ø4	
Power supply voltage		24 VDC ±10%	
Current consumption	Sensing DC mode	200 mA or less (While standing by: 120 mA or less)	
	Pulse DC mode	200 mA or less (When sensor is not used: 170 mA or less)	
	DC mode	170 mA or less	
Input signal	Emission of static electricity is suspended.	Connect to GND (Voltage range: 5 VDC or less, Current consumption: 5 mA or less)	
	Maintenance	Connect to +24 V (Voltage range: 19 VDC to power supply voltage, Current consumption: 5 mA or less)	
Output signal	Static electricity removal is completed.	Max. load current: 100 mA Residual voltage: 1 V or less (At load current 100 mA) Max. applied voltage: 28 VDC	
	Maintenance output		
	Irregularity		
	Sensor monitor output <small>Note 2)</small>	Voltage output 1 to 5 V (Connect a 10 kΩ or larger load.)	
Effective discharge distance		50 to 2000 mm (Sensing DC mode: 200 to 2000 mm)	
Operating ambient temperature, Operating fluid temperature		0 to 50°C	
Operating ambient humidity		35 to 80%Rh (With no condensation)	
Material		Cover of ionizer: ABS, Electrode needle: Tungsten, Monocrystal silicon, Stainless steel	
Vibration resistance		Durability 50 Hz Amplitude 1 mm XYZ each 2 hours	
Shock resistance		10 G	
Compliance with overseas standards / directive		CE (EMC directive: 89/336/EEC, 92/31/EEC, 93/68/EEC, 2004/108/EC, Low voltage directive: 73/23/EEC, 93/68/EEC) UL U.S. Standard for Electrostatic Air Cleaner, UL857, fourth edition CSA Canadian Standard for Electrostatic Air Cleaner, CAN/CSA C22.2 No.187-M1986	

Note 1) In case where air purge is performed between a charged object and an ionizer at a distance of 300 mm.

Note 2) In cases where the potential of a charged object is measured using a feedback sensor, the relationship between the potential being measured, the sensor monitor output voltage and the detection range of the sensor vary depending on the sensor's installation distance. Refer to page 1057.

Number of Electrode Cartridges and Mass

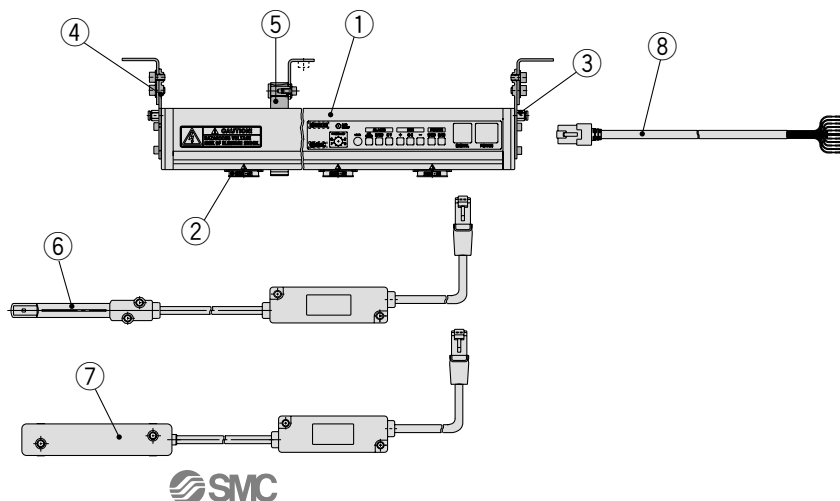
Bar length (mm)	300	380	620	780	1100	1260	1500	1900	2300
Number of electrode cartridges	3	4	7	9	13	15	18	23	28
Mass (g)	470	530	720	850	1100	1220	1410	1730	2040

Sensor

Sensor model	IZS31-DF (Feedback sensor)	IZS31-DG (Autobalance sensor)
Operating ambient temperature	0 to 50°C	
Operating ambient humidity	35 to 85%Rh (With no condensation)	
Case material	ABS	ABS, Stainless steel
Vibration resistance	Durability 50 Hz Amplitude 1 mm XYZ each 2 hours	
Shock resistance	10 G	
Mass	200 g (Including cable weight)	220 g (Including cable weight)
Installation distance	10 to 50 mm (Recommended)	—
Compliance with overseas standards / directive	CE (EMC directive: 89/336/EEC, 92/31/EEC, 93/68/EEC, 2004/108/EC, Low voltage directive: 73/23/EEC, 93/68/EEC)	

Construction

No.	Description
1	Ionizer
2	Electrode cartridge
3	One-touch fitting
4	End bracket
5	Center bracket
6	Feedback sensor
7	Autobalance sensor
8	Power supply cable



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Functions

1. Operation mode

There are 3 different operation modes (Sensing DC mode / Pulse DC mode / DC mode) for the IZS31, which can be selected based on the application and operating condition.

(1) Sensing DC mode

The discharge time is reduced by detecting the workpiece's charge condition with a feedback sensor which feeds the data back to the ionizer and causes ions with the polarity best suited for static electricity removal being emitted. The static electricity removal completion signal turns off when the workpiece's electrostatic potential falls within ± 30 V. Note)

This mode is suited for removing static electricity from heavily charged workpieces.

Either "Energy Saving Run" or "Continuous Static Electricity Removal Run" can be selected as the operation method depending on the ionizer's operation mode after the completion of static electricity removal.

Energy saving run	The ionizer stops discharging upon completion of static electricity removal. It resumes discharging when the workpiece's electrostatic potential exceeds ± 30 V. <small>Note)</small> For the removal of static electricity from conductive workpieces, "Energy Saving Run" is recommended.
Continuous static electricity removal run	Even after the completion of static electricity removal, this method continues to remove static electricity using DC pulses while controlling the ion balance, so that the workpiece's electrostatic potential falls within ± 30 V. For the removal of static electricity from nonconductive workpieces, "Continuous Static Electricity Removal Run" is recommended.

Note) When the feedback sensor is installed at a height of 25 mm.

(2) Pulse DC mode

Alternatively emits positive and negative ions.

When an autobalance sensor is used, the ionizer automatically adjusts the ion balance to within ± 30 V.

If the ion balance exceeds ± 30 V due to electrode needle contamination, the ionizer outputs a maintenance output signal.

This mode is suited for removing spatial static electricity or preventing workpieces from becoming electrostatically charged.

■ When an autobalance sensor is used.

Either "Manual Operation" or "Automatic Operation" can be selected as the operation method depending on the method of ion balance adjustment.

Manual run	When a maintenance start signal is input or the ionizer is turned on, this method adjusts the ion balance. For the removal of static electricity from moving workpieces, "Manual Operation" is recommended. Start system operation after the completion of ion balance adjustment.
Automatic run	This method continuously adjusts the ion balance. For the removal of static electricity from stationary workpieces or the removal of spatial static electricity, "Automatic Operation" is recommended.

■ When an autobalance sensor is not used.

Use a balance adjustment trimmer to adjust the ion balance. This requires the separate use of a measuring instrument to verify the ion balance.

(3) DC mode

Continuously emits positive and negative ions. Parts other than the object need to be appropriately grounded to prevent from being charged. This mode cannot emit both positive and negative ions at the same time.

Functions

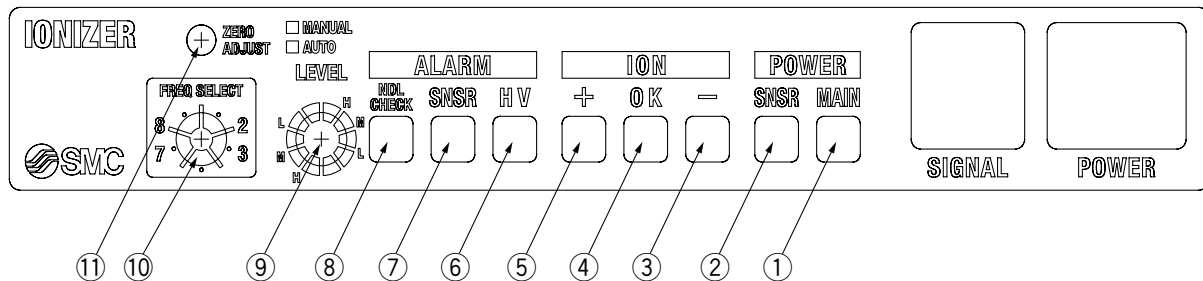
2. Stain-detection on an electrode needle

When a maintenance start signal is input the ionizer detects any deterioration that may interfere with the electrode needles' capability to remove static electricity. If the needles need to be cleaned due to such deterioration, a maintenance display LED comes on and the ionizer outputs a maintenance output signal is ON. Even when the maintenance output signal is ON, the ionizer continuously emits ions.

Note) Deterioration in static electricity removal capability cannot be detected by only connecting a feedback sensor or autobalance sensor.

Verify the capability by periodically inputting a maintenance start signal.

3. Display/Setting component description



No.	Description	Type	Contents
1	Power supply display	LED (Green)	Illuminates when power is supplied. Blinks when the supply voltage is abnormal.
2	Sensor display	LED (Green)	Illuminates when the feedback sensor or autobalance sensor is connected.
3	Negative display	LED (Blue)	Functionality differs depending on the operation mode. Refer to "Determining the Model and Settings" on pages 1066, 1070 and 1073.
4	Static electricity removal completion display	LED (Green)	
5	Positive display	LED (Orange)	
6	Irregular high voltage display	LED (Red)	Illuminates when an irregular current on an electrode needle.
7	Irregular sensor display	LED (Red)	Illuminates when the feedback sensor or autobalance sensor is not in normal operation.
8	Maintenance display	LED (Red)	Illuminates when electrode needle contamination is detected. Blinks while the contamination is being detected.
9	Maintenance level selection switch	Rotary switch	Functionality differs depending on the operation mode. Refer to "Determining the Model and Settings" on pages 1064, 1068, 1069 and 1072.
10	Frequency selection switch	Rotary switch	
11	Ion balance adjustment trimmer	Trimmer	Used to adjust the ion balance when the autobalance sensor is not used.

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Determining the Model and Settings 1 / Sensing DC Mode

1. Sensing DC mode (Refer to page 1068 when using the ionizer in the pulse DC mode, or refer to page 1072 when using it in the DC mode.)

1) Selection of bar length

- Select the appropriate length suited for a work size by referring to “Electricity Removal Characteristics” and “Electricity Removal Range”, etc.

2) Installation of the ionizer

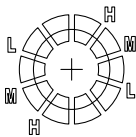
- Install within 200 to 2000 mm. Although the main unit can also be used at other distances, it may fail to operate normally depending on the conditions of use. Before use, always verify that the main unit is functioning normally.

3) Installation of the sensor

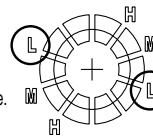
- Install the feedback sensor with the detection hole facing the charged surface.
- Installation at a height from 10 to 50 mm is recommended. Although the sensor can also be used at other heights, it may fail to operate normally depending on the conditions of use. Before use, always verify that the sensor operates normally. (Refer to “Installation height of feedback sensor and discharge time/ion balance” on page 1056 as a guide.)
- When the ionizer and feedback sensor are connected, the sensing DC mode is automatically selected.

4) Configuration of stain-detection level on an electrode needle

- Maintenance level selection switch
- Set the switch to either H (high), M (middle) or L (low). At settings other than these, the ionizer does not perform electrode needle stain-detection.



H (High): High sensitivity..... Level that does not effect the discharge time.
M (Middle): Middle sensitivity... Level at which the discharge time is longer than it was initially.
L (Low): Low sensitivity..... Level at which the alarm goes off before being disable to discharge.

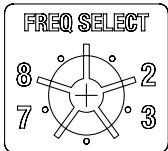


* Settings with the same letter share the same level.

Note) Stain-detection starts when a maintenance start signal is input.

5) Configuration of frequency selection switch

- Use this switch to select “Energy Saving Run” or “Continuous Static Electricity Removal Run”.
- This switch is used to select ion generation frequency for “Continuous Static Electricity Removal Run,” after the completion of static electricity removal.



How to run			Switch setting
Energy saving run	Automatically stops emitting electricity even after completing the static electricity removal.		
Continuous static electricity removal run	Continuously eliminates static electricity with pulse DC by controlling the ion balance so that the charged potential on a workpiece would be within ± 30 V even after completing the static electricity removal. The ionizer generates ions at the preset frequency.		 0...1 Hz 1...3 Hz 2...5 Hz 3...10 Hz 4...15 Hz 5...20 Hz 6...30 Hz 7...60 Hz

Determining the Model and Settings 1 / Sensing DC Mode

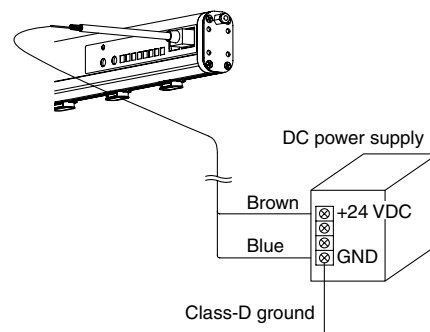
6) Wiring of power supply cable

- Connect the dedicated power supply cable.

■ Connection with ionizer driving power supply

Symbol	Cable color	Description	Connection needs	Contents
DC1 (+)	Brown	Power supply 24 VDC	○	Ionizer driving power supply cable
DC1 (-)	Blue	Power supply GND [FG]	○	
OUT4	Green	Sensor monitor output	△	Outputs the workpiece's electrostatic potential as an analog signal (1 to 5 V).

* DC1 (-) [Blue] is sure to ground it according to class-D. If the terminal is not grounded, the ionizer may malfunction.



■ Wiring of input/output signal power supply cable

Symbol	Cable color	Description	Connection needs	Contents
DC2 (+)	Red	Power supply 24 VDC	○	Input/output signal power supply cable
DC2 (-)	Black	Power supply GND	○	
IN1	Yellow green	Electricity discharge stop signal	○	Signal for enabling/disabling the ionizer (NPN specification) Discharging is enabled when connected to DC2 (-) [Black]. (PNP specification) Discharging is enabled when connected to DC2 (+) [Red].
IN2	Gray	Maintenance start signal	△	Signal to be input when determining the necessity of electrode needle maintenance
—	White	—	—	—
—	Orange	—	—	—
OUT1	Pink	Electricity removal completion signal	△	Signal to be output when the workpiece's electrostatic potential is within ± 30 V to be ON when electrode needle contamination is being detected.
OUT2	Yellow	Maintenance output signal	△	Signal to be ON when electrode needle maintenance is necessary.
OUT3	Purple	Irregular signal	△	Signal to be ON in the normal operation and to be OFF when high voltage irregularity, sensor irregularity, CPU irregularity are detected.

○: Minimum wiring requirement for ionizer operation

△: Wiring necessary to use various functions

—: Wiring not required in the sensing DC mode. Exercise caution to ensure that this wire does not short-circuit to other wires.

7) Air piping

- For single-side piping, block the unused port with the M-5P plug supplied with the ionizer.

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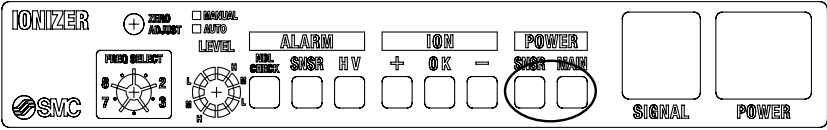
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Determining the Model and Settings 1 / Sensing DC Mode

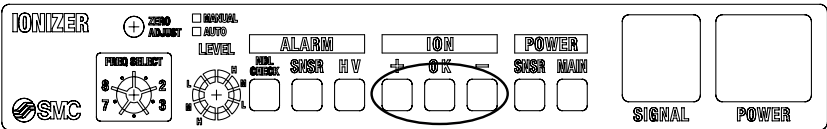
8) LED display

■ POWER LED...Indicates the state of power input and sensor connection.



LED name		Function
POWER	MAIN	Illuminates when power is supplied (Green). (Blinks when the power supply is irregular.)
	SNSR	Illuminates when the feedback sensor is connected (Green).

■ ION LED...Indicates the workpiece's state of electrostatic charging.

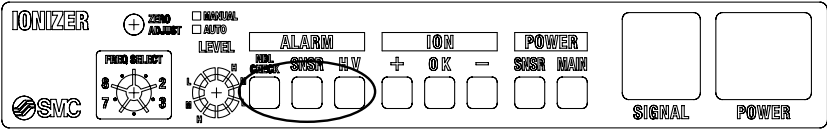


LED name		Function
ION	+	Illuminates when the workpiece is positively charged (Orange).
	OK	Illuminates when the workpiece electrostatic potential is low (Green).
	-	Illuminates when the workpiece is negatively charged (Blue).

· The workpiece's state of electrostatic charge can be checked by reading the LED displays.

Workpiece electric polarity	LED + OK -	Workpiece electric charge voltage	■ Light ON ■ Blinking at 4 Hz □ Light OFF
Positive ↑ Static electricity removal completed ↓ Negative	■ □ □	+400 V or higher	
	■ □ □	+100 V to +400 V	
	■ ■ □	+30 V to +100 V	
	□ ■ □	Within ±30 V	
	□ ■ ■	-30 V to -100 V	
	□ □ ■	-100 V to -400 V	
	□ □ ■	-400 V or lower	

■ ALARM LED...Indicates abnormal states of the ionizer.



LED name		Function
ALARM	HV	Illuminates when an abnormal current flows through an electrode needle (Red).
	SNSR	Illuminates when the feedback sensor is not operating normally (Red).
	NDL CHECK	Illuminates when electrode needle contamination is detected (Red). (Blinks while the contamination is being detected.)

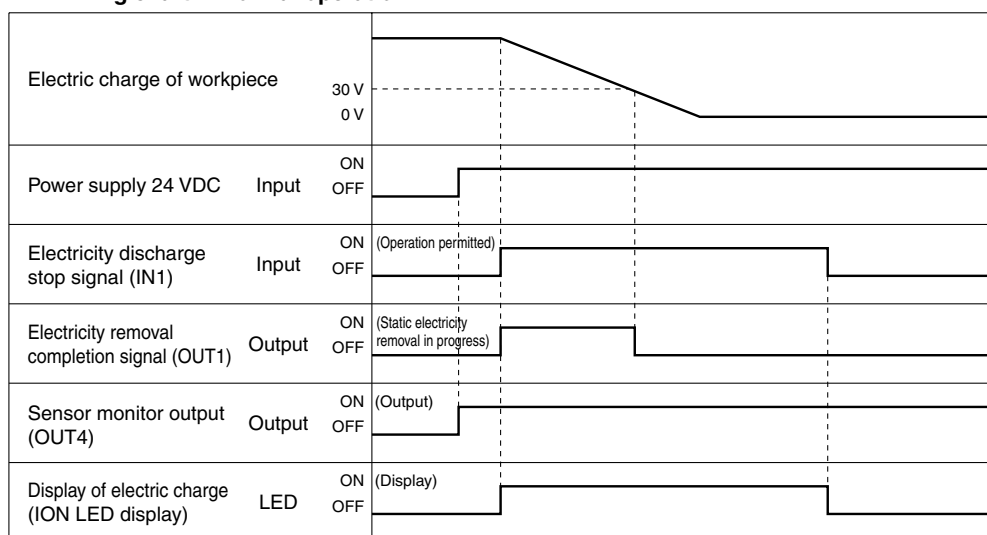
Determining the Model and Settings 1 / Sensing DC Mode

9) Alarm

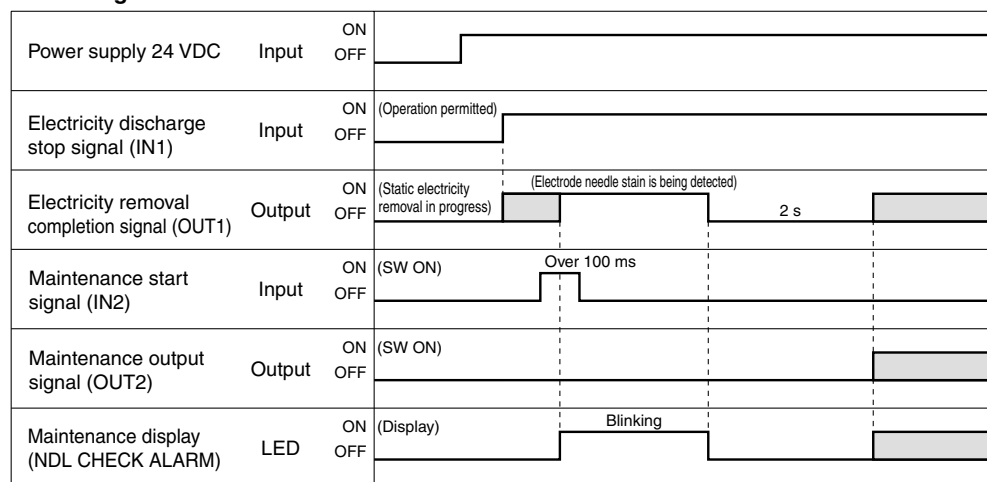
Alarm item	Description	Corrective actions
High voltage irregularity	Gives notification of the occurrence of an abnormal current, such as high-voltage leakage. The ionizer stops discharging, turns on the HV ALARM display, and turns OFF the fault signal (OUT3).	Turn OFF the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal OFF, then ON.
Sensor irregularity	Gives notification that the feedback sensor has become unable to operate normally. The ionizer turns on the SNSR ALARM display and turns OFF the fault signal (OUT3).	Turn OFF the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal OFF, then ON.
CPU irregularity	Gives notification of the occurrence of a failure in the CPU due to noise, etc. All of the LED displays blink and a fault signal (OUT3) is turned OFF.	Turn OFF the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal OFF, then ON.
Electrode needle maintenance	Gives notification that electrode needle maintenance is necessary. The NDL CHECK ALARM display comes on and a maintenance output signal (OUT2) is ON.	Turn OFF the power, clean the electrode needles, and turn the power on again.

10) Timing chart

■ Timing chart in normal operation



■ Timing chart in electrode needle stain is detected.



■ : Either ON or OFF depending on the situation.

- A signal indicating static electricity removal completion is ON when the detection of electrode needle stain is in progress.

⚠ Caution

Ions are emitted from the ionizer to detect electrode needle stain and the workpiece may therefore be electrostatically charged. Perform this detection procedure in the absence of workpieces.

Determining the Model and Settings 2 / Pulse DC Mode

2. Pulse DC mode

1) Selection of bar length

- Determine the length suited for a work size, referring to the “Electricity Removal Characteristics” and “Electricity Removal Range”, etc.

2) Installation of the ionizer

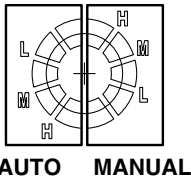
- Install the ionizer within 50 to 2000 mm of the object requiring electricity removal. However, install the main unit at a distance from 100 to 2000 mm when using an autobalance sensor. Although the main unit can also be used at other distances, it may fail to operate normally depending on the conditions of use. Before use, always verify that the main unit is functioning normally.

3) Installation of the sensor

- When adjusting the ion balance using a sensor, install an autobalance sensor.
- Install the sensor immediately below the ionizer so that it is level with the workpiece.
- When an autobalance sensor is connected, the balance adjustment trimmer settings are nullified.

4) Configuration of maintenance level selection switch

- This switch is used to select “Manual Operation” or “Automatic Operation” when an autobalance sensor is connected to adjust the ion balance.

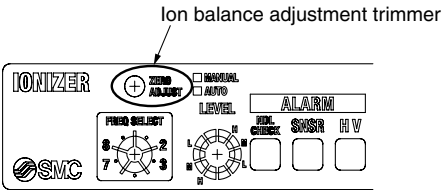


Details of operation		Switch setting
Manual operation	When a maintenance start signal is input or the ionizer is turned on, the ionizer detects electrode needle contamination according to ion balance adjustment and detection level settings. An ion balance adjustment value for each ion generation frequency is retained. When the ion generation frequency is changed, adjust the ion balance. After adjustment, the autobalance sensor may be removed as ion balance adjustment will not be performed again until a maintenance start signal is input.	MANUAL
Automatic operation	The ionizer continuously adjusts the ion balance. When the autobalance sensor is removed, adjust the ion balance manually using the balance adjustment trimmer.	AUTO

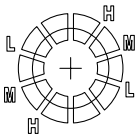
* Set the switch according to the stain-detection level.

When an autobalance sensor is not used.

When an autobalance sensor is not used, set the switch to AUTO. Then, adjust the ion balance manually using the balance adjustment trimmer.



- Configuration of stain-detection level on an electrode needle.
- Set the switch to either H (high), M (middle) or L (low). At settings other than these, the ionizer does not perform electrode needle stain-detection



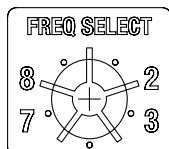
- H (High): High sensitivity..... Level that does not effect the discharge time.
- M (Middle): Middle sensitivity... Level at which the discharge time is longer than it was initially.
- L (Low): Low sensitivity..... Level at which the alarm goes off before being disable to discharge.

- Stain-detection starts when a maintenance start signal is input.
- When the switch is set to H, M or L, the ionizer performs electrode needle stain-detection and then adjusts the ion balance.

Determining the Model and Settings 2 / Pulse DC Mode

5) Frequency selection switch setting

- Selects ion generation frequency



Ion generation frequency	Switch setting
1 Hz	0
3 Hz	1
5 Hz	2
10 Hz	3
15 Hz	4
20 Hz	5
30 Hz	6
60 Hz	7

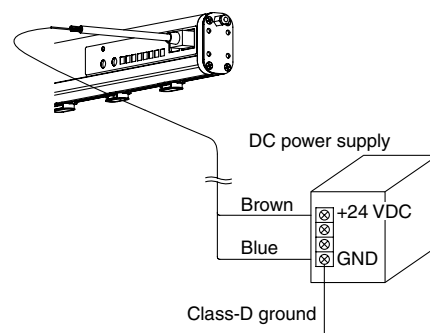
6) Wiring of power supply cable

- Connect the dedicated power supply cable.

■ Connection with ionizer driving power supply

Symbol	Cable color	Description	Connection needs	Contents
DC1 (+)	Brown	Power supply 24 VDC	○	Ionizer driving power supply cable
DC1 (-)	Blue	Power supply GND [FG]	○	
OUT4	Green	Sensor monitor output	—	—

* DC1 (-) [Blue] is sure to ground it according to class-D. If the terminal is not grounded, the ionizer may malfunction.



■ Wiring of input/output signal power supply cable

Symbol	Cable color	Description	Connection needs	Contents
DC2 (+)	Red	Power supply 24 VDC	○	Input/output signal power supply cable
DC2 (-)	Black	Power supply GND	○	
IN1	Yellow green	Electricity discharge stop signal	○	Signal for enabling/disabling the ionizer (NPN specification) Discharging is enabled when connected to DC2 (-) [Black]. (PNP specification) Discharging is enabled when connected to DC2 (+) [Red].
IN2	Gray	Maintenance start signal	△	Signal to be input when determining the necessity of electrode needle maintenance
—	White	—	—	—
—	Orange	—	—	—
OUT1	Pink	Electricity removal completion signal	△	Signal to be ON when electrode needle contamination is being detected.
OUT2	Yellow	Maintenance output signal	△	Signal to be ON when electrode needle maintenance is necessary.
OUT3	Purple	Irregular signal	△	Signal to be ON in the normal operation and to be OFF when high voltage irregularity, sensor irregularity, CPU irregularity are detected.

○: Minimum wiring requirement for ionizer operation

△: Wiring necessary to use various functions

—: Wiring not required in the sensing DC mode. Exercise caution to ensure that this wire does not short-circuit to other wires.

7) Air piping

- For single-side piping, block the unused port with the M-5P plug supplied with the ionizer.

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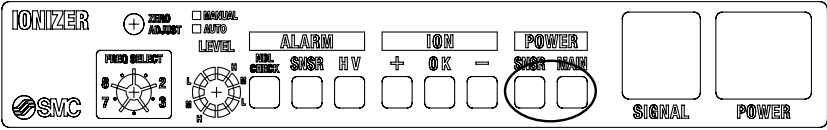
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Determining the Model and Settings 2 / Pulse DC Mode

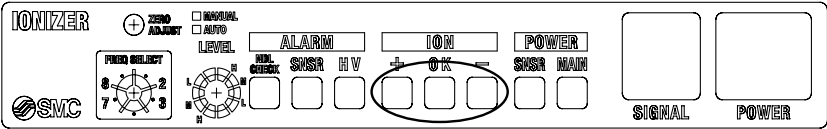
8) LED display

■ POWER LED...Indicates the state of power input and sensor connection.



LED name		Function
POWER	MAIN	Illuminates when power is supplied (Green). (Blinks when the power supply is irregular.)
	SNSR	Illuminates when the autobalance sensor is connected (Green).

■ ION LED...Indicates the polarity of ions being emitted and the ion balance.



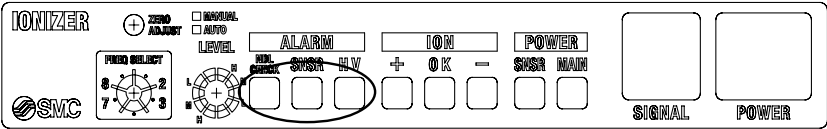
LED name		Function
ION	+	Illuminates that positive ions are being emitted from the ionizer (Orange).
	OK	[With autobalance sensor] Indicates the state of ion balancing (Green). [Without autobalance sensor] Remains turned off.
	-	Illuminates that negative ions are being emitted from the ionizer (Blue).

· The state of ion balancing can be checked by reading the LED display.

Ion balance	OK LED
Under ±30 V	Light ON (or Blinking)
Over ±30 V	Light OFF

* The OK LED display blinks when the ion balance is approaching the limits of the adjustable range, signaling that the time for electrode needle maintenance is near.

■ ALARM LED...Indicates abnormal states of the ionizer.



LED name		Function
ALARM	HV	Illuminates when an abnormal current flows through an electrode needle (Red).
	SNSR	Illuminates when the autobalance sensor is not operating normally (Red).
	NDL CHECK	Illuminates when electrode needle stain is detected (Red). (Blinks when the stain is being detected.)

Determining the Model and Settings 2 / Pulse DC Mode

9) Alarm

Alarm item	Description	Corrective actions
High voltage irregularity	Gives notification of the occurrence of an abnormal current, such as high-voltage leakage. The ionizer stops discharging, turns on the HV ALARM display, and turns OFF the fault signal (OUT3).	Turn OFF the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal OFF, then ON.
Sensor irregularity	Gives notification that the feedback sensor has become unable to operate normally. The ionizer turns on the SNSR ALARM display and turns OFF the fault signal (OUT3).	Turn OFF the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal OFF, then ON.
CPU irregularity	Gives notification of the occurrence of a failure in the CPU due to noise, etc. All of the LED displays blink and a fault signal (OUT3) is turned OFF.	Turn OFF the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal OFF, then ON.
Electrode needle maintenance	Gives notification that electrode needle maintenance is necessary. The NDL CHECK ALARM display comes on and a maintenance output signal (OUT2) is ON.	Turn OFF the power, clean the electrode needles, and turn the power on again.

10) Timing chart

■ Timing chart in normal operation

Power supply 24 VDC	Input	ON	OFF	
Electricity discharge stop signal	Input	ON	OFF	(Operation permission)
State of emitting ions		ON	OFF	(Emission)

■ Timing chart in electrode needle stain is detected or ion balance is detected.

(a) When an auto-balance sensor is connected.

(1) Manual run

Power supply 24 VDC	Input	ON	OFF	
Electricity discharge stop signal (IN1)	Input	ON	OFF	(Operation permitted)
Electricity removal completion signal (OUT1)	Output	ON	OFF	(Electrode needle stain-detection or ion balance adjustment in progress) 2 s
Maintenance start signal (IN2)	Input	ON	OFF	(SW ON) Over 100 ms
Maintenance output signal (OUT2)	Output	ON	OFF	(SW ON)
Maintenance display (NDL CHECK ALARM)	LED	ON	OFF	(Display) Blinking
Internal processing	Stain-detection			← (Performed when the maintenance level selection switch is set to H, M or L)
	Ion balance adjustment			←

(2) Auto run

Power supply 24 VDC	Input	ON	OFF	
Electricity discharge stop signal (IN1)	Input	ON	OFF	(Operation permitted)
Electricity removal completion signal (OUT1)	Output	ON	OFF	(Electrode needle stain-detection in progress) 2 s
Maintenance start signal (IN2)	Input	ON	OFF	(SW ON) Over 100 ms
Maintenance output signal (OUT2)	Output	ON	OFF	(SW ON)
Maintenance display (NDL CHECK ALARM)	LED	ON	OFF	(Display) Blinking
Internal processing	Stain-detection			← (Performed when the maintenance level selection switch is set to H, M or L)
	Ion balance adjustment			←

(b) When an auto-balance sensor is not connected.

Power supply 24 VDC	Input	ON	OFF	
Electricity discharge stop signal (IN1)	Input	ON	OFF	(Operation permitted)
Electricity removal completion signal (OUT1)	Output	ON	OFF	(Electrode needle stain-detection in progress) 2 s
Maintenance start signal (IN2)	Input	ON	OFF	(SW ON) Over 100 ms
Maintenance output signal (OUT2)	Output	ON	OFF	(SW ON)
Maintenance display (NDL CHECK ALARM)	LED	ON	OFF	(Display) Blinking
Internal processing	Stain-detection			← (Performed when the maintenance level selection switch is set to H, M or L)
	Ion balance adjustment			←

■ : Either ON or OFF depending on the situation.

- A signal indicating static electricity removal completion is output when the detection of electrode needle stain is in progress.

⚠ Caution

Ions are emitted from the ionizer to detect electrode needle stain and the workpiece may therefore be electrostatically charged. Perform this detection procedure in the absence of workpieces.

Determining the Model and Settings 3 / DC Mode

3. DC mode

1) Selection of bar length

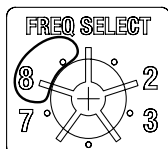
- Determine the length suited for a work size, referring to the “Electricity Removal Characteristics” and “Electricity Removal Range”, etc.

2) Installation of the ionizer

- Install the ionizer within 50 to 2000 mm of the object requiring electricity removal. Although the main unit can also be used at other distances, it may fail to operate normally depending on the conditions of use. Before use, always verify that the main unit is functioning normally.

3) Frequency selection switch setting

- Use this switch to select “Positive Ion Emission” or “Negative Ion Emission”.



Ion polarity	Configuration of switch
Positive ion emission	8
Negative ion emission	9

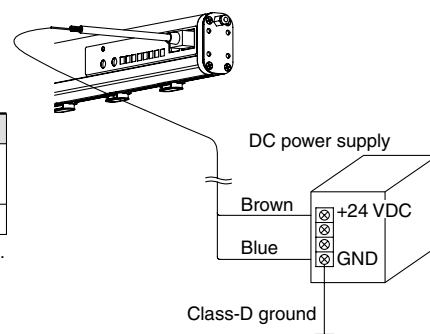
4) Wiring of power supply cable

- Connect the dedicated power supply cable.

■ Connection with ionizer driving power supply

Symbol	Cable color	Description	Connection needs	Contents
DC1 (+)	Brown	Power supply 24 VDC	○	Ionizer driving power supply cable
DC1 (-)	Blue	Power supply GND [FG]	○	
OUT4	Green	Sensor monitor output	—	—

* DC1 (-) [Blue] is sure to ground it according to class-D. If the terminal is not grounded, the ionizer may malfunction.



■ Wiring of input / output signal power supply cable

Symbol	Cable color	Description	Connection needs	Contents
DC2 (+)	Red	Power supply 24 VDC	○	Input/output signal power supply cable
DC2 (-)	Black	Power supply GND	○	
IN1	Yellow green	Electricity discharge stop signal	○	Signal for enabling/disabling the ionizer (NPN specification) Discharging is enabled when connected to DC2 (-) [Black]. (PNP specification) Discharging is enabled when connected to DC2 (+) [Red].
IN2	Gray	Maintenance start signal	—	—
—	White	—	—	—
—	Orange	—	—	—
OUT1	Pink	Electricity removal completion signal	—	—
OUT2	Yellow	Maintenance output signal	—	—
OUT3	Purple	Irregular signal	△	Signal to be ON in the normal operation and to be OFF when irregular high voltage and irregular CPU are detected.

○: Minimum wiring requirement for ionizer operation

△: Wiring necessary to use various functions

—: Wiring not required in the sensing DC mode. Exercise caution to ensure that this wire does not short-circuit to other wires.

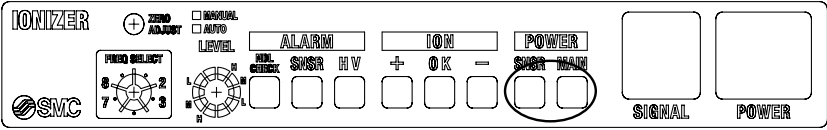
5) Air piping

- For single-side piping, block the unused port with the M-5P plug supplied with the ionizer.

Determining the Model and Settings 3 / DC Mode

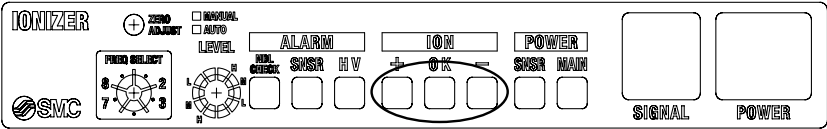
6) LED display

■ POWER LED...Indicates the state of power input and sensor connection.



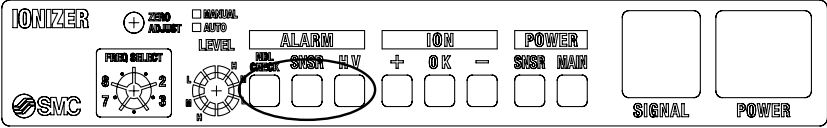
LED name		Function
POWER	MAIN	Illuminates when power is supplied (Green). (Blinks when the power supply is irregular.)
	SNSR	Light OFF

■ ION LED...Indicates the polarity of ions being emitted.



LED name		Function
ION	+	Illuminates that positive ions are being emitted from the ionizer (Orange).
	OK	Light OFF
	-	Illuminates that negative ions are being emitted from the ionizer (Blue).

■ ALARM LED...Indicates abnormal states of the ionizer.



LED name		Function
ALARM	HV	Illuminates when an abnormal current flows through an electrode needle (Red).
	SNSR	Light OFF
	NDL CHECK	Light OFF

7) Alarm

Alarm item	Description	Corrective actions
High voltage irregularity	Gives notification of the occurrence of an abnormal current, such as high-voltage leakage. The ionizer stops discharging, turns on the HV ALARM display, and turns OFF the fault signal (OUT3).	Turn OFF the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal OFF, then ON.
CPU irregularity	Gives notification of the occurrence of a failure in the CPU due to noise, etc. All of the LED displays blink and a fault signal (OUT3) is turned OFF.	Turn OFF the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal OFF, then ON.

8) Timing chart

■ Timing chart at normal operation

Power supply 24 VDC	Input	ON OFF	
Electricity discharge stop signal (IN1)	Input	ON OFF	
State of emitting ions		ON OFF	

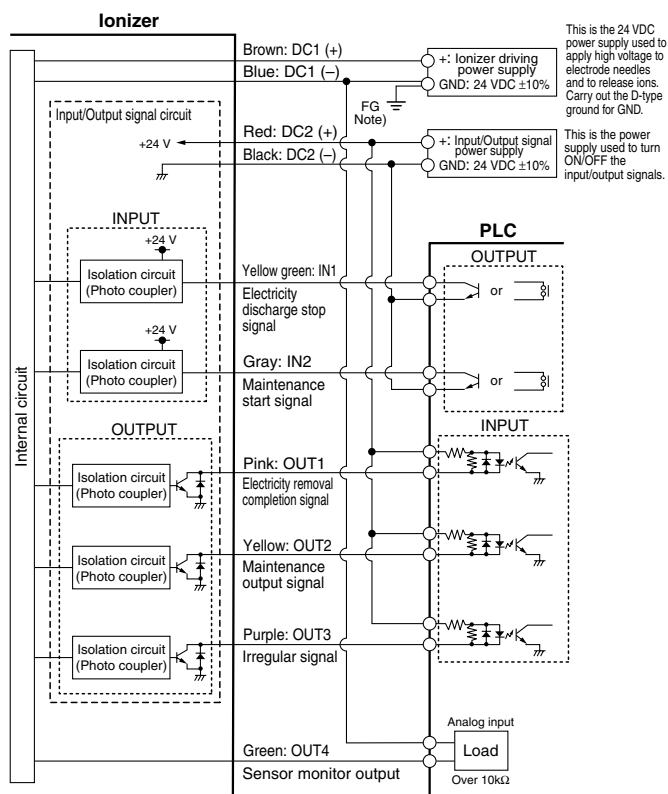
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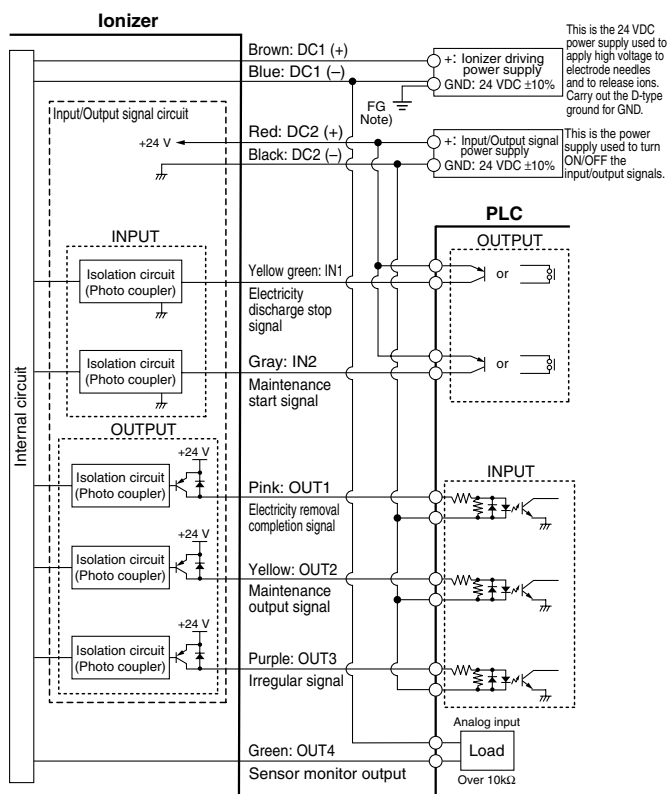
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Connection Circuit of Power Cable

■ NPN specification



■ PNP specification



Note) Carry out the D-type ground for GDN (DC1 (-): Blue) for ionizer driving power supply. Output signals (OUT1 to OUT3) are isolated with FG by the isolation circuit (photo coupler), but the sensor monitor output* (OUT4: Green) is not isolated with FG.

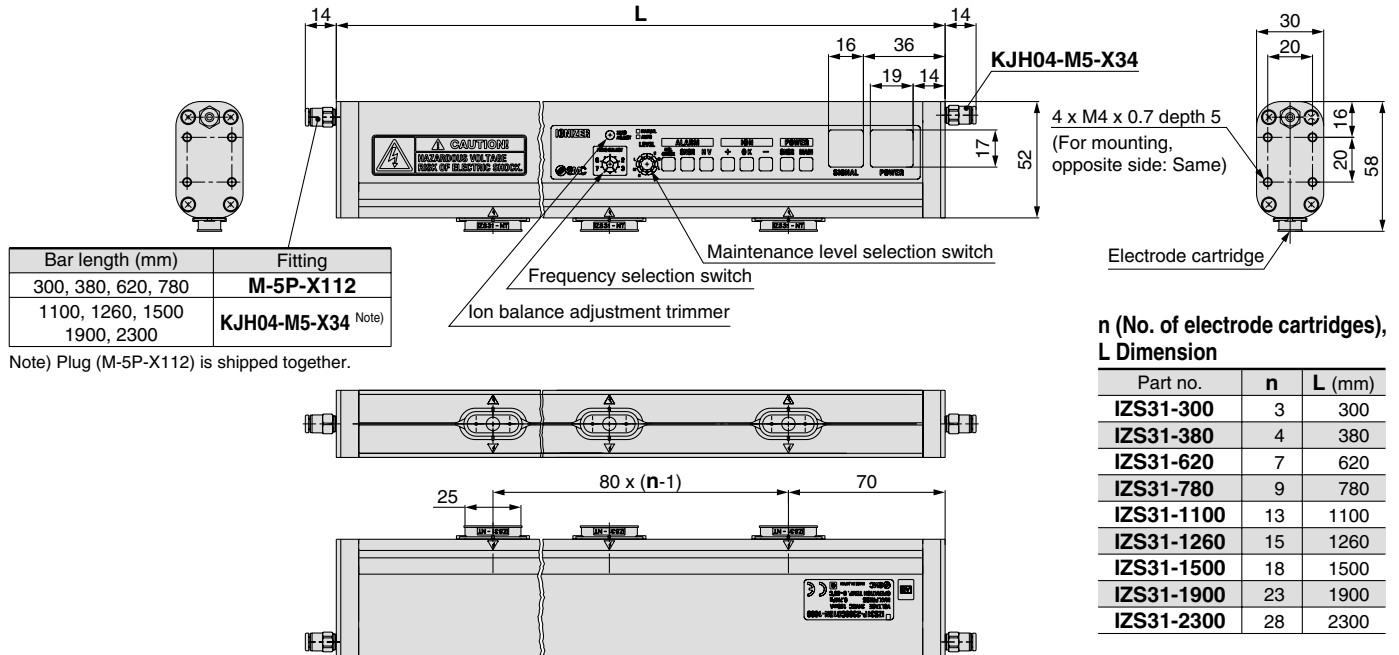
*When the feedback sensor is used, measured electric potential for the sensor is output through analog output.

When the autobalance sensor is used, it is not output.

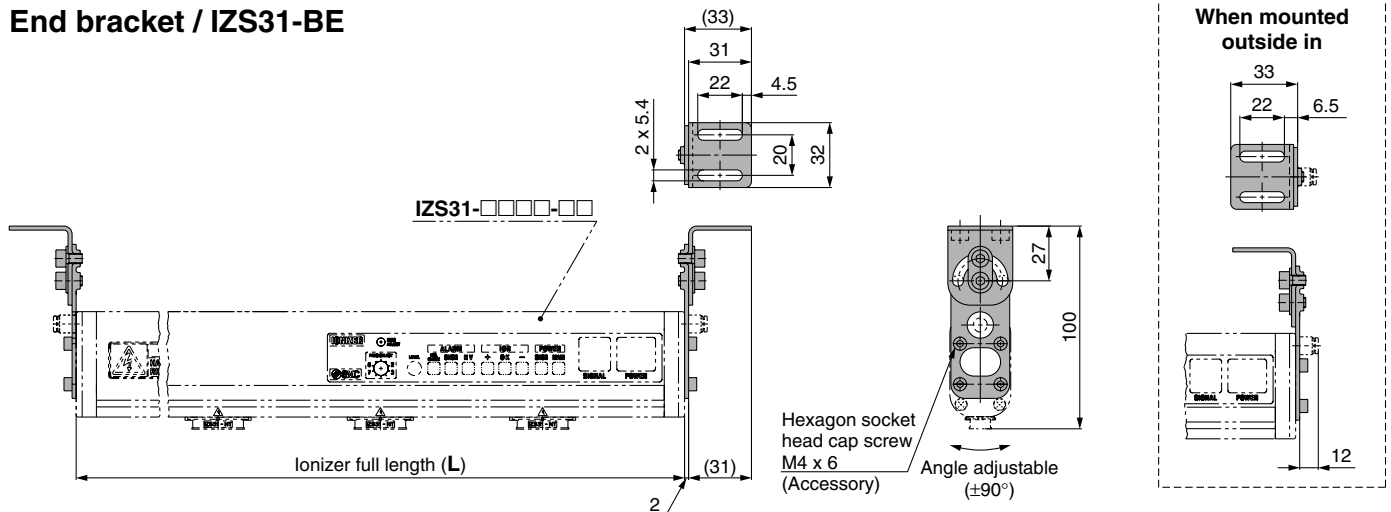
The driving power supply DC1 and input/output signal power supply DC2 can be connected to the same power supply. In such as case, D-type grounded DC1 (-) [FG] and input/output signal lines will not be isolated.

Dimensions

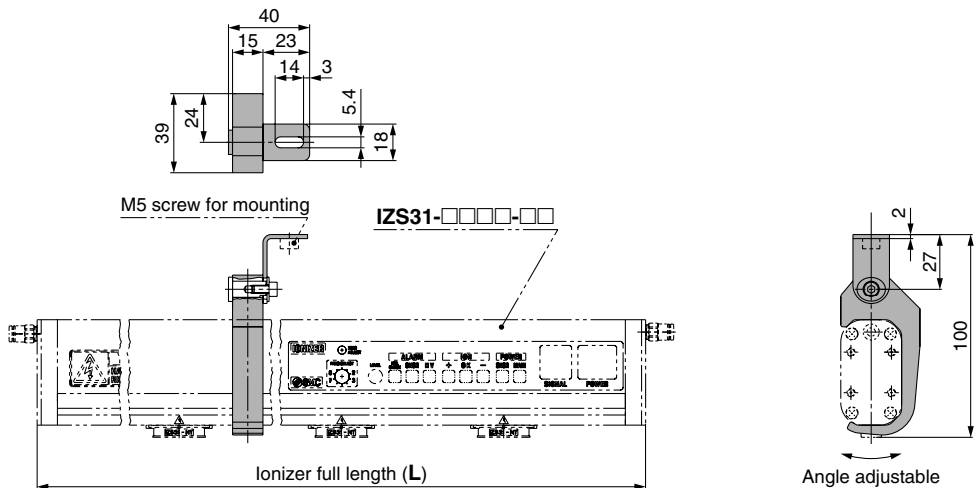
Ionizer / IZS31-□□□□-□□



End bracket / IZS31-BE



Center bracket / IZS31-BM



Note) Number of center brackets included in a model with brackets (Refer to "How to Order" on page 1058).

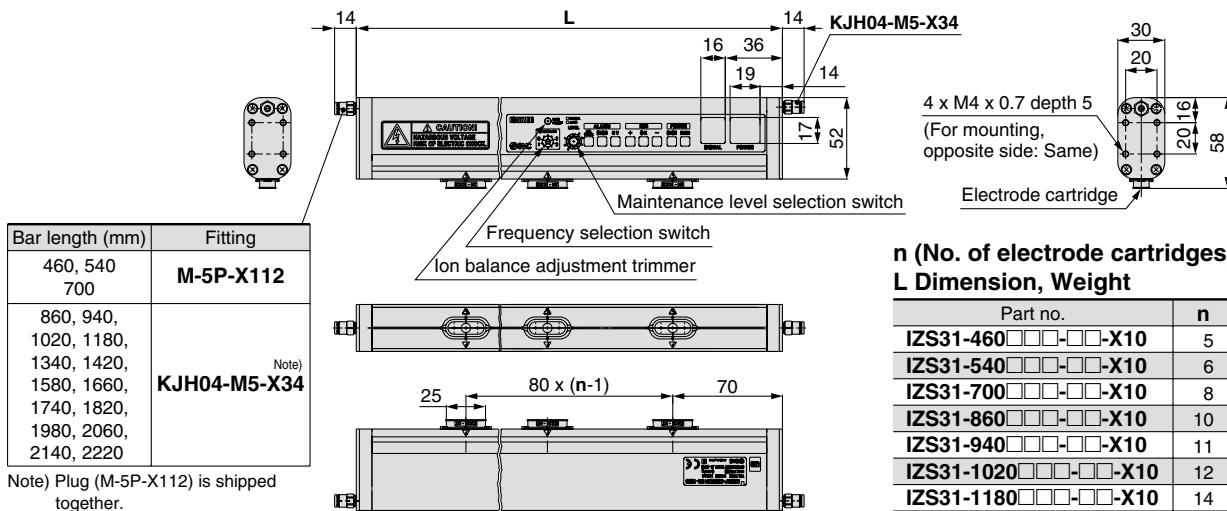
Bar length (mm)	Center bracket
300, 380, 620, 780	None
1100, 1260, 1500	With 1 pc.
1900, 2300	With 2 pcs.

1 Non-standard bar length compliant

Symbol

X10

* For "How to Order", refer to page 1058.



n (No. of electrode cartridges), L Dimension, Weight

Part no.	n	L (mm)	Mass (g)
IZS31-460□□□-□□-X10	5	460	600
IZS31-540□□□-□□-X10	6	540	660
IZS31-700□□□-□□-X10	8	700	780
IZS31-860□□□-□□-X10	10	860	910
IZS31-940□□□-□□-X10	11	940	970
IZS31-1020□□□-□□-X10	12	1020	1040
IZS31-1180□□□-□□-X10	14	1180	1160
IZS31-1340□□□-□□-X10	16	1340	1290
IZS31-1420□□□-□□-X10	17	1420	1350
IZS31-1580□□□-□□-X10	19	1580	1480
IZS31-1660□□□-□□-X10	20	1660	1540
IZS31-1740□□□-□□-X10	21	1740	1600
IZS31-1820□□□-□□-X10	22	1820	1660
IZS31-1980□□□-□□-X10	24	1980	1790
IZS31-2060□□□-□□-X10	25	2060	1850
IZS31-2140□□□-□□-X10	26	2140	1920
IZS31-2220□□□-□□-X10	27	2220	1980

No. of Center Brackets

Bar length (mm)	Quantity
460 to 700	None
860 to 1580	With 1 pc.
1660 to 2220	With 2 pcs.

2 Power supply cable, made-to-order component

Symbol

X13

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

Note 1) 11 mm or longer power supply cables are not CE Marking-compliant.

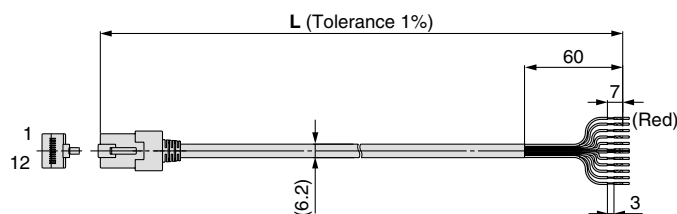
Note 2) Use standard power supply cables for 3 m and 10 m lengths.

How to Order

IZS31-CP□-X13

Cable length

Symbol	L: Cable length
01	1000 mm
02	2000 mm
04	4000 mm
05	5000 mm
06	6000 mm
07	7000 mm
08	8000 mm
09	9000 mm
11	11000 mm
12	12000 mm
13	13000 mm
14	14000 mm
15	15000 mm
16	16000 mm
17	17000 mm
18	18000 mm
19	19000 mm
20	20000 mm



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3 Model with 40 mm-pitch electrode cartridges

Symbol

X15

Install the electrode cartridges at a 40 mm-pitch.
(Standard pitch: 80 mm).

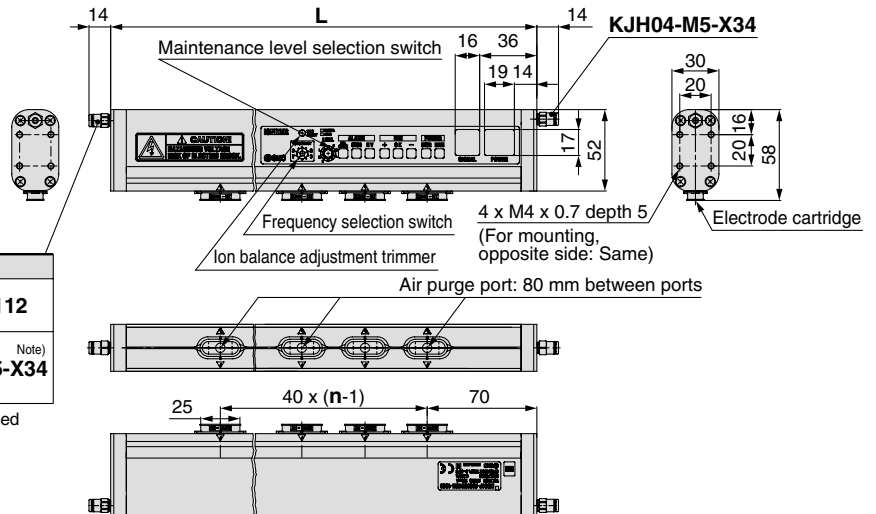
Note) The maximum bar length is 1260 mm.

The air purge nozzles are arranged at an 80 mm-pitch.

- Prevents electricity removal irregularities when the height setting is low.

Bar length (mm)	Fitting
300, 380, 620, 780	M-5P-X112
1100, 1260	KJH04-M5-X34 <small>Note)</small>

Note) Plug (M-5P-X112) is shipped together.



**n (No. of electrode cartridges),
L Dimension, Weight**

Part no.	n	L (mm)	Mass (g)
IZS31-300 □□□-□□- X15	5	300	480
IZS31-380 □□□-□□- X15	7	380	540
IZS31-620 □□□-□□- X15	13	620	740
IZS31-780 □□□-□□- X15	17	780	880
IZS31-1100 □□□-□□- X15	25	1100	1140
IZS31-1260 □□□-□□- X15	29	1260	1270



Series IZS31

Specific Product Precautions 1

Be sure to read before handling.

Selection

⚠ 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 in 4 on front matter 58), 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.

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.

Mounting

⚠ 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 tubings 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
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 air tubing, refer to the instruction manual or catalog for tubing.

2. Mounting on a plane surface.

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

Mounting

⚠ Warning

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.

Thread size	Recommended tightening torque
M3	0.61 to 0.63 N·m
M4	0.73 to 0.75 N·m
M5	1.3 to 1.5 N·m

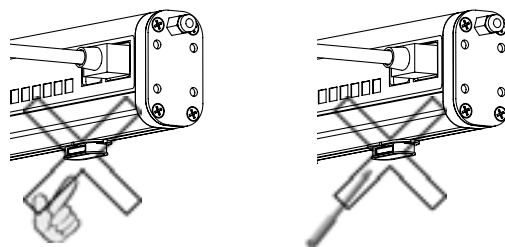
5. Do not touch the electrode pin directly with fingers or metallic tools.

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 or cartridge is damaged with a tool, the specification will not be met and damage and/or an accident can 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.



6. 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.

7. Installation and adjustment should be conducted after turning off the power supply.

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Series IZS31 Specific Product Precautions 2

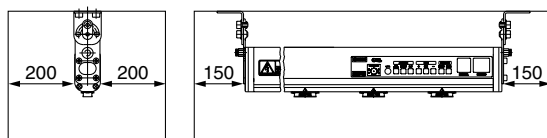
Be sure to read before handling.

Mounting

⚠ Caution

1. Install the ionizer 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 removal and therefore result in a decrease in efficiency.



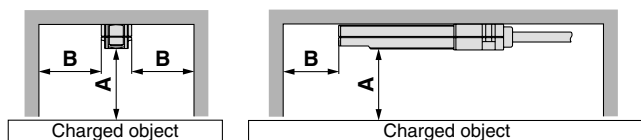
Unit: mm

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

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

2. Install a feedback sensor away from the wall as illustrated below.

The ionizer may fail to measure electrostatic potentials correctly if a wall or other obstacle exists within the clearances shown in the following figure.



(mm)

A	B
10	20
20	40
25	45
30	55
40	65
50	75

Wiring / Piping

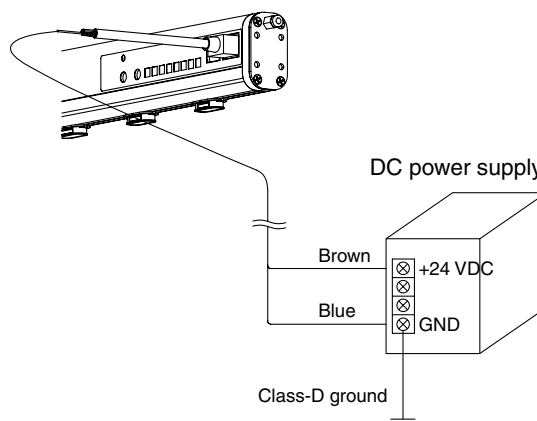
⚠ Warning

1. Before wiring confirm if the power supply voltage is enough and that it is within the specifications before wiring.

Be sure to use UL Listed/Recognized 24 VDC power supply with Class 2 output of under 2.1 A.

2. Be sure to provide class-D grounding in order to maintain product performance.

If such grounding is not provided, not only may the ion balance be disrupted but electric shocks may also result and the ionizer or power supply may break down.



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

4. To connect a feedback sensor or autobalance sensor to the ionizer, use the cable included with the sensor. Do not disassemble or modify the ionizer.

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.



Series IZS31

Specific Product Precautions 3

Be sure to read before handling.

Operating Environment / Storage Environment

Warning

1. Observe the operating fluid temperature and ambient temperature range.

Fluid and ambient temperature ranges are 0 to 50°C for the ionizer, feedback sensor and autobalance sensor. 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.

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.

- Avoid using in a place that exceeds an ambient temperature range of 0 to 50 °C.
- Avoid using in a place that exceeds an ambient humidity range of 35 to 80 % Rh.
- Avoid using in a place where condensation occurs due to a drastic temperature change.
- Avoid using in a place in the presence of corrosive or explosive gas or where there is a volatile combustible.
- Avoid using in an atmosphere where there are particles, conductive iron powders, oil mist, salt, solvent, blown dust, cutting oil (water, liquid), etc.
- Avoid using in a place where ventilated air from an air conditioner is directly applied to the product.
- Avoid using in a closed place without ventilation.
- Avoid using in direct sunlight or radiated heat.
- Avoid using in a place where there is a strong magnetic noise (strong electric field, strong magnetic field, or surge).
- Avoid using in a place where static electricity is discharged to the main body.
- Avoid using in a place where a strong high frequency occurs.
- Avoid using in a place where this product is likely to be damaged by lightning.
- Avoid using in a place where direct vibration or shock is applied to the main body.
- 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.

Supply clean compressed air by using an air dryer (IDF series), air filter (AF/AFF series), and mist separator (AFM/AM series)

5. The ionizer and sensors are not protected against a surge caused by a lightning.

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 a long period of time will lower the static electricity eliminating performance, if particles attach to the electrode pin.

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.

2. 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.

3. Do not disassemble or modify this product.

Otherwise, an electrical shock, damage and/or a fire may occur. Also, the disassembled or modify 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 (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.

If the modular plug is at a difficult angle to attach/detach, the modular jack's mounting section may be damaged and cause a disorder.

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

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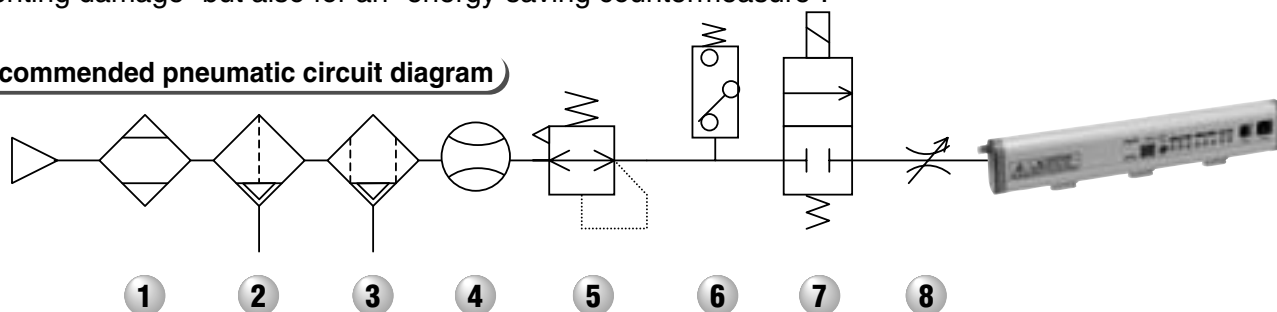
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Related Products

SMC can provide all the equipment required to supply air to the ionizer.

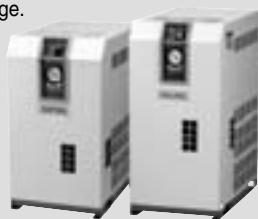
Consider the equipment below not only for providing an “opportunity to decrease maintenance” and “preventing damage” but also for an “energy-saving countermeasure”.

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 matters such as power particles in the compressed air.



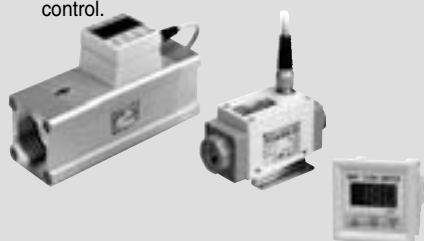
3 Mist Separator / Series AFM

Eliminates oil mist which is difficult to eliminate with an air filter.

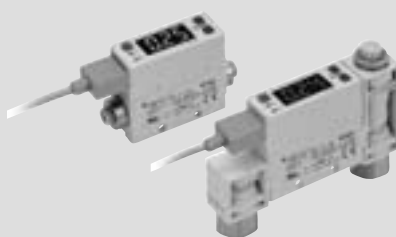


4 Digital Flow Switch / Series PFA2

Decreases the air consumption by flow control.



2-Color Display Digital Flow Switch / Series PFM



5 Regulator / Series AR

Decreases the air consumption by setting to an appropriate pressure.



6 Digital Pressure Switch / Series ISE30

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 Throttle Valve / 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 hollow element

Filtration: 0.01

Filtering efficiency: Over 99.99%, no contamination of workpieces due to the hollow element.

