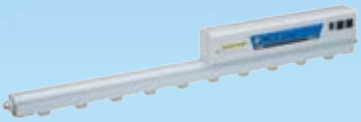
Ionizer

New

RoHS

Potential amplitude: 25 V or less Note 1)

Rapid elimination of static electricity: Fastest time: 0.1 seconds Note 2)

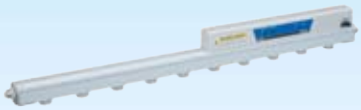


Dual AC type *Series IZS42*

Potential amplitude is reduced with Dual AC type.

Feedback sensor type *Series IZS41*

Rapid elimination of static electricity by a feedback sensor



Standard type *Series IZS40*

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

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

Series IZS40/41/42

SMC

CAT.ES100-97A

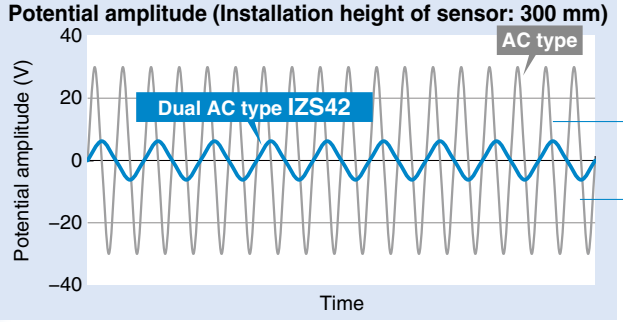
Dual AC type Series IZS42 (Potential amplitude reduction specification)

Potential amplitude: 25 V or less 80% reduction compared to the conventional model

(Compared to the IZS31 series at the installation height of 300 mm)

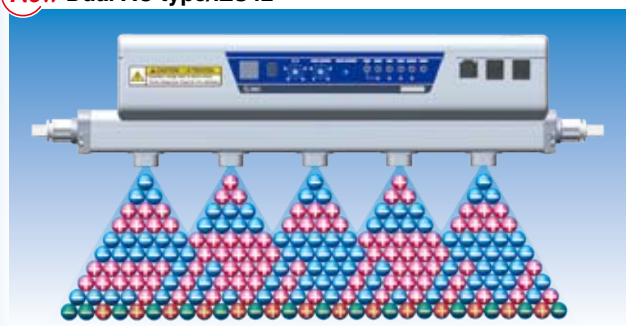
Potential amplitude is reduced with **SMC independent Dual AC type sensor**.
Static electricity elimination may be achieved without causing damage to a device which is sensitive to electrostatic discharge (ESD).
Potential amplitude applied to the applicable workpiece is reduced even if it the workpiece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

Potential amplitude (Installation height of sensor: 300 mm)



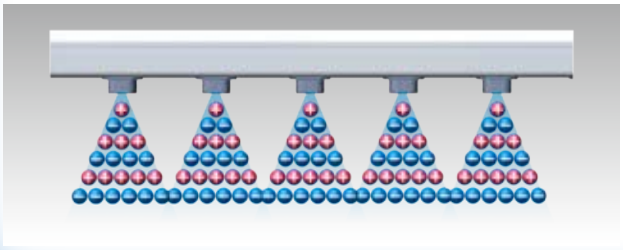
Independent Dual AC type is implemented.

New Dual AC type/IZS42



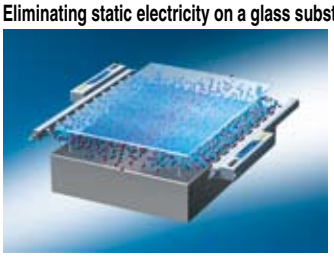
Discharges + ions and - ions at the same time to allow the + and - ions to reach the workpiece evenly, thereby reducing the potential amplitude.

AC type



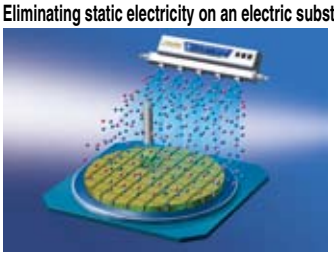
+ ion and - ion layers reach the workpiece within the same cycle, which increases the potential amplitude.

Eliminating static electricity on a glass substrate



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

Eliminating static electricity on an electric substrate



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

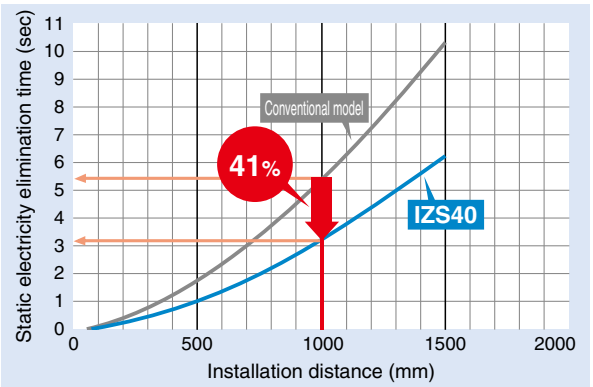
Standard type Series IZS40

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

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

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

Conditions: Ion generation frequency 30 Hz Supply pressure: 0.1 MPa
The IZS40 has a high speed static electricity elimination cartridge.

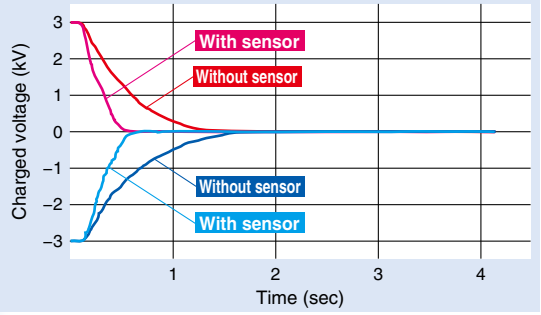


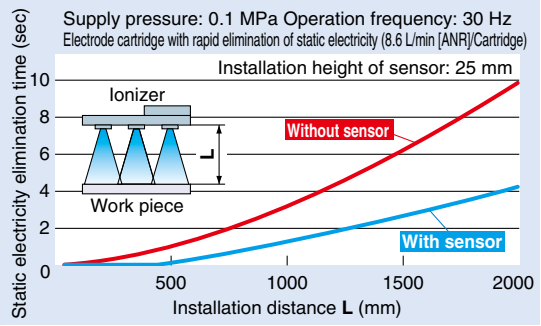
Feedback sensor type *Series IZS41* (High speed static electricity elimination specification)

Rapid elimination of static electricity by a feedback sensor

Note) An ion balance sensor is installed.

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

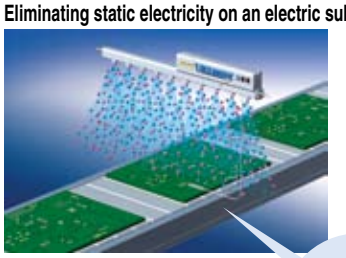




Feedback sensor

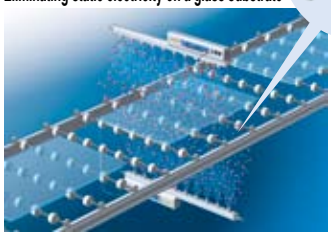
Detects the polarity of a discharged object and measures the charged voltage.

Eliminating static electricity on an electric substrate



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

Eliminating static electricity on a glass substrate



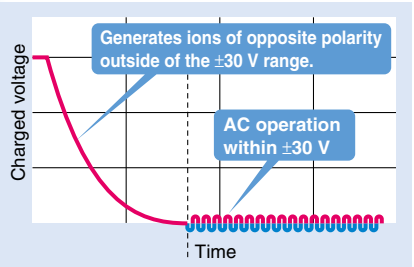
·Prevents breakage due to adhesion and discharge.
·Prevents adhesion of dust.

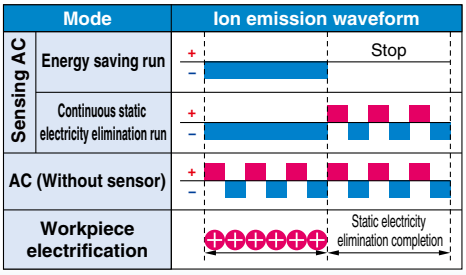
Run mode after static electricity elimination (ion balance: within ±30 V) can be selected.

■**Energy saving run mode** Stops generating ions after static electricity elimination to reduce power consumption.

■**Continuous static electricity elimination run mode** After static electricity elimination, the ionizer changes to AC mode. Continues to eliminate static electricity to make it approach 0 V even if the ion balance is within ±30 V.

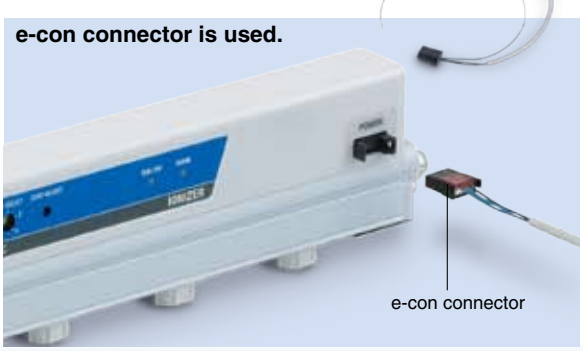
Continuous static electricity elimination run mode





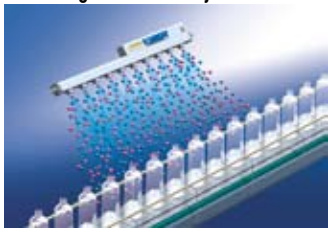
- **AC adapter power supply is available.**

e-con connector is used.



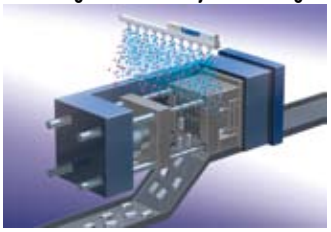
Suitable for static electricity elimination of resin and rubber pieces (small parts).

Eliminating static electricity on PET bottles



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

Eliminating static electricity on molded goods



·Improves detachability of molded goods from a die.

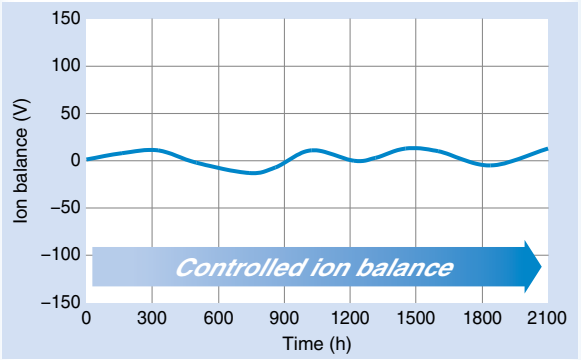
Reduction of adjustment and maintenance labor by auto balance sensor IZS41 IZS42

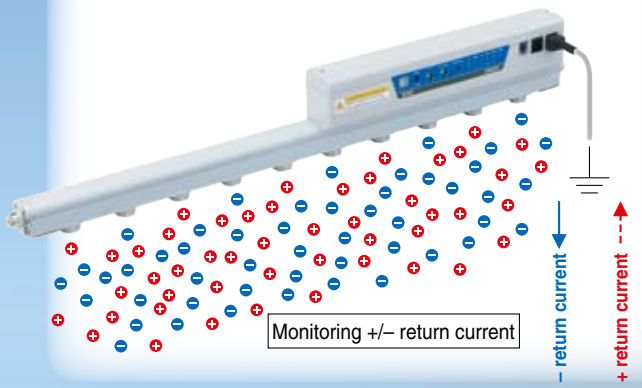
Built-in type (Standard)

The sensor is installed within the ionizer body and may be mounted anywhere.

Monitoring the amount of ion emitted from an ionizer, the autobalance sensor maintains the initial ion balance by adjusting the +/– ion supply rate.

Ion balance (image)



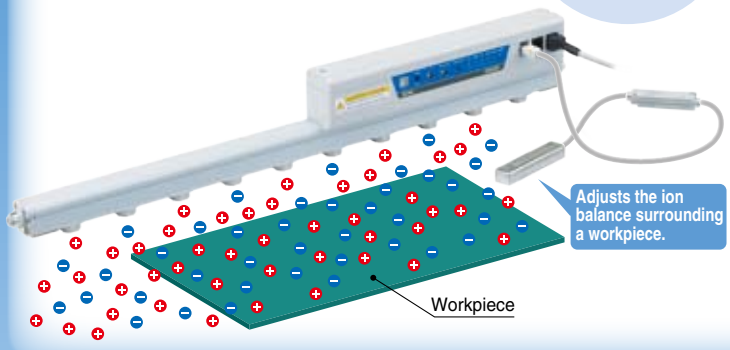


High accuracy type (Option)

- **The ion balance near the workpiece is accurately adjusted.**
- **The object is not affected by the height of installation or any disturbance interference.**

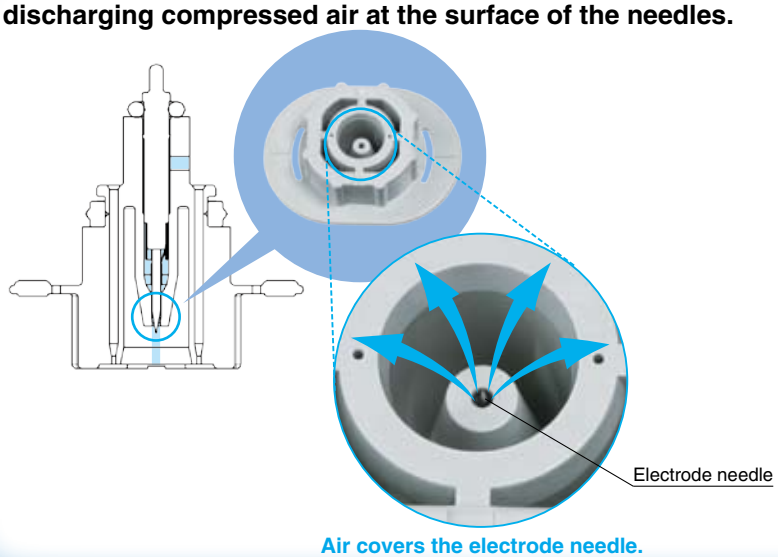
Auto balance sensor

Measures the ion balance condition.



Low maintenance electrode cartridges are used. IZS40 IZS41 IZS42

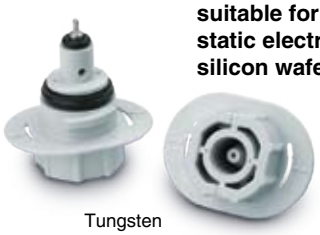
- **Minimizes contamination of electrode needles by discharging compressed air at the surface of the needles.**



Air covers the electrode needle.

- **2 types of electrode needle materials**

Tungsten : **Ion balance ±30 v**
Single crystal silicon: **Ion balance ±30 v, suitable for eliminating static electricity of silicon wafer**



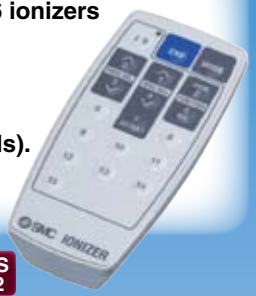
Tungsten
(Cartridge color: White)

Silicon
(Cartridge color: Gray)

Refer to Features 5 for Models and Functions.

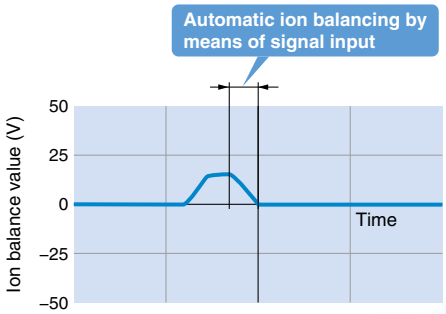
Setting ionizer with remote controller IZS41 IZS42

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



- "Ion balance adjustment at external signal input" or "Ion balance adjustment at any time" can be selectable.

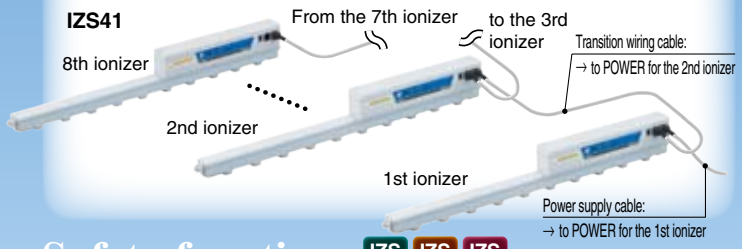
The auto balance sensor may be connected only when adjusting the ion balance.



Transition wiring may be used. IZS41 IZS42

Total number of ionizers that may be connected IZS41: Max. 8 units. IZS42: Max. 5 units.
<Conditions> Bar length 340 to 2500 mm, Power supply cable 3 m, Transition wiring cable 2 m

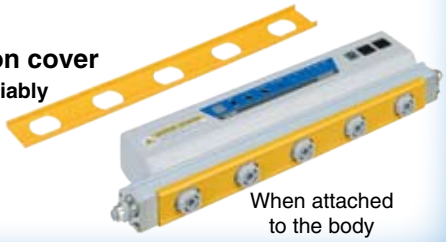
Reduces man hours required for connecting wires to the power supply.



Safety functions IZS40 IZS41 IZS42

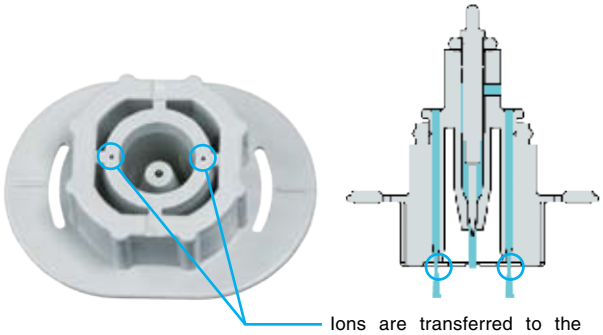
- **Electrode cartridge drop prevention function**
  Locking by double-action

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



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

High speed de-ionizing cartridge

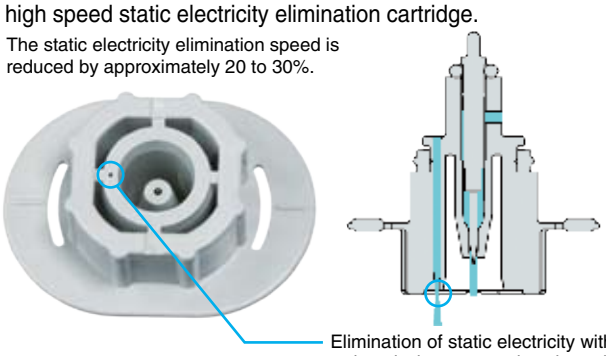


Ions are transferred to the workpieces efficiently by using two pneumatic nozzles to improve the static electricity elimination performance.

Energy saving type de-ionizing cartridge

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

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



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

Ionizer *Series IZS40/41/42*

Models and Functions

Series		IZS42	IZS41	IZS40
Method of applying voltage		Dual AC	AC, Sensing AC, DC	AC, DC
Sensor (Auto balance)	Built-in type (Standard)	●	●	—
	High accuracy type (Option)	●	●	
Feedback sensor (Option)		—	●	—
I/O		●	●	—
Transition wiring may be used. Note 1)		●	●	—
Electrode needle contamination detector		●	●	—
Incorrect high voltage ion discharge detection		●	●	●
Low maintenance electrode		●	●	●
Cartridge	Energy saving type de-ionizing	●	●	●
	High speed de-ionizing			
With one-touch fitting (ø6, ø8, ø10)		●	●	●
Bracket mount		●	●	●
Non-standard bar length (Made to Order)		●	●	●

Note 1) Order transition wiring separately.

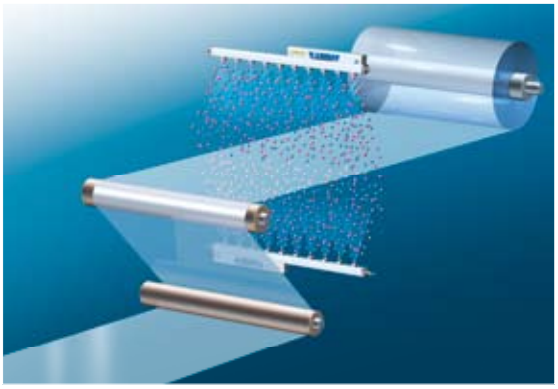
Accessories sold separately (per series)

Series	IZS42	IZS41	IZS40
Remote controller	●	●	—
AC adapter	●	●	●
Drop prevention cover	●	●	●
Electrode needle cleaning kit	●	●	●

Application Examples

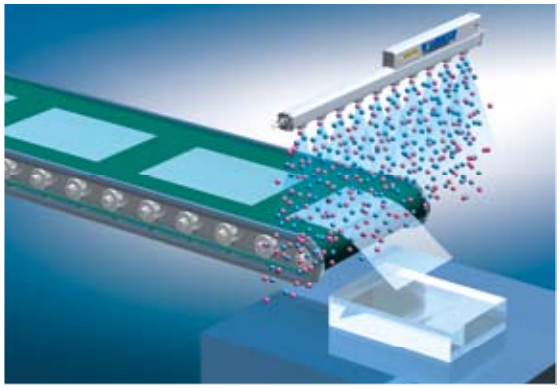
Eliminating static electricity from films

· Prevents adhesion of dust. · Prevents winding failure due to wrinkles etc.



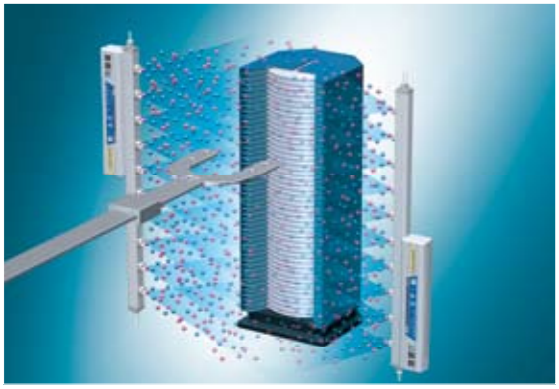
Eliminating static electricity on film molded goods

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



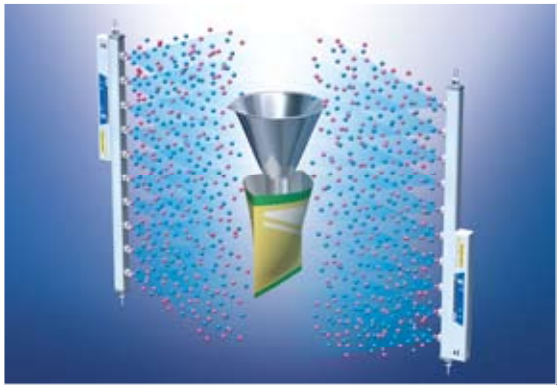
Eliminating static electricity during wafer transfer

· Prevents breakage due to discharge between wafers and hands.



Eliminating static electricity from packing films

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

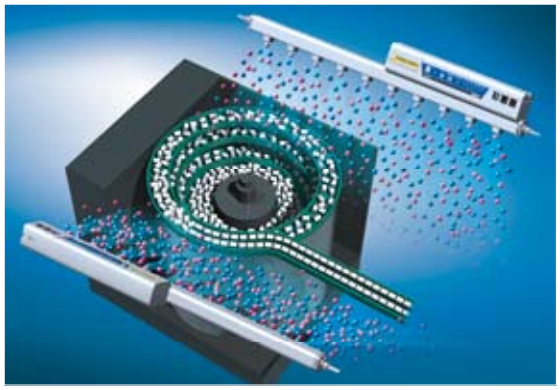


Eliminating static electricity from lens

· Removes dust from lens. · Prevents adhesion of dust.

Eliminating static electricity from parts feeder

· Prevents clogging of parts feeder.



Series IZS40/41/42
Technical Data

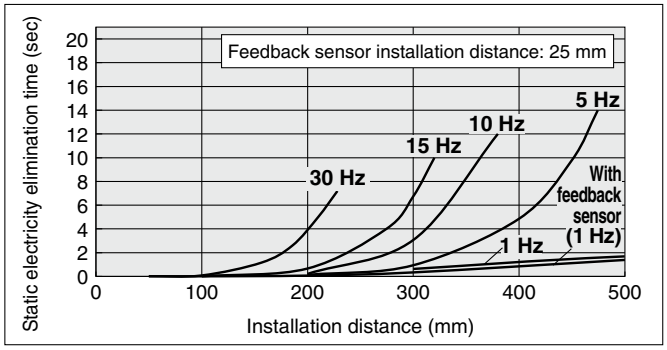
Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material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

Static Electricity Elimination Characteristics

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

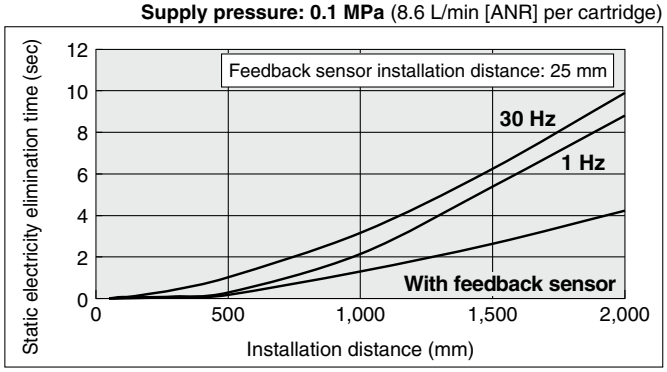
IZS40, 41

1) Without air purge

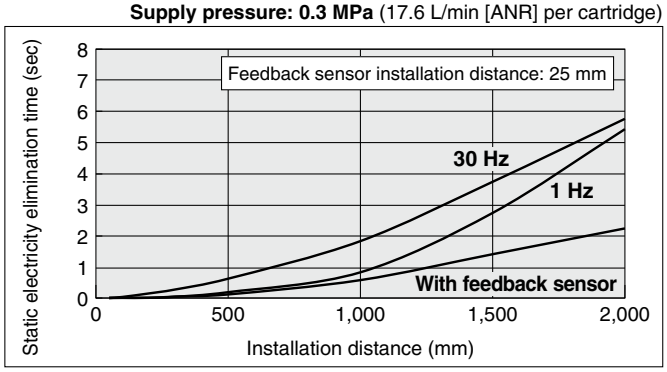


2) With high speed de-ionizing cartridge, With air purge

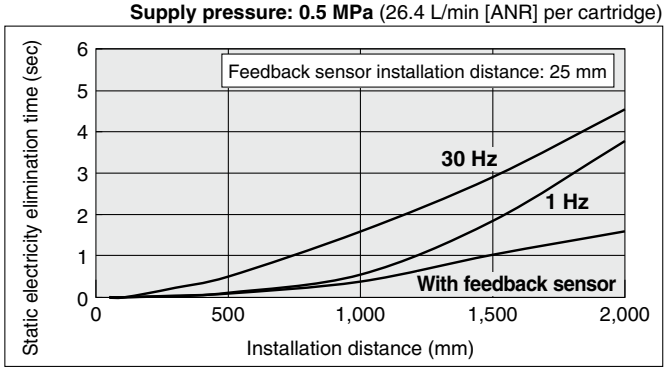
Supply pressure: 0.1 MPa (8.6 L/min [ANR] per cartridge)



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

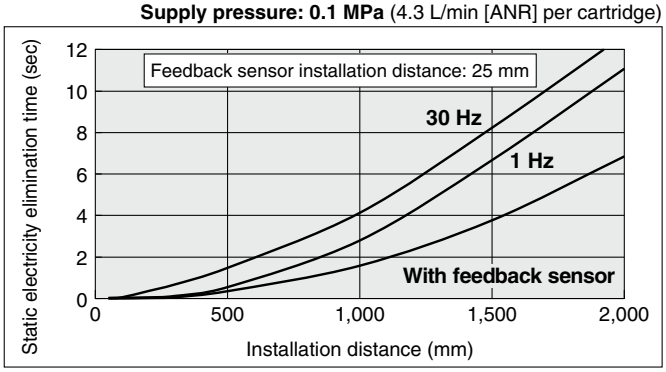


Supply pressure: 0.5 MPa (26.4 L/min [ANR] per cartridge)

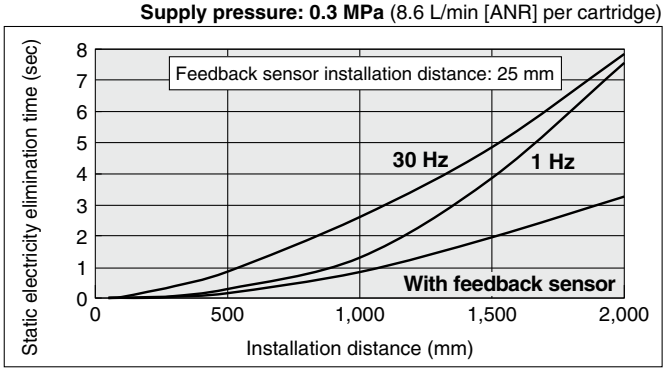


3) With energy saving type de-ionizing cartridge, With air purge

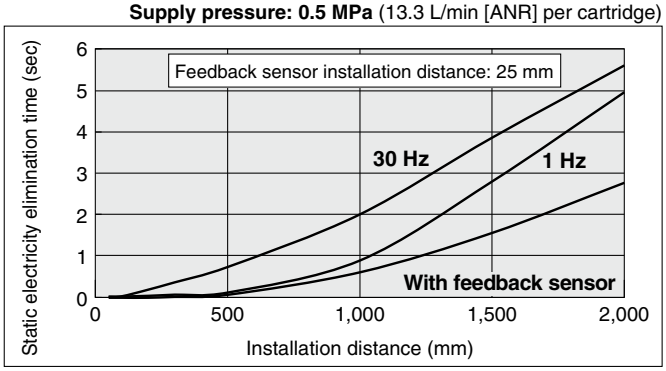
Supply pressure: 0.1 MPa (4.3 L/min [ANR] per cartridge)



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

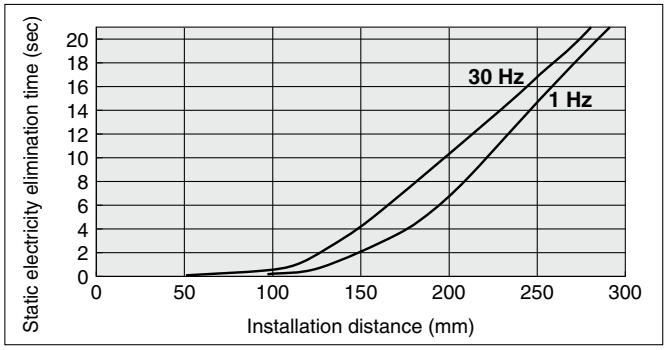


Supply pressure: 0.5 MPa (13.3 L/min [ANR] per cartridge)



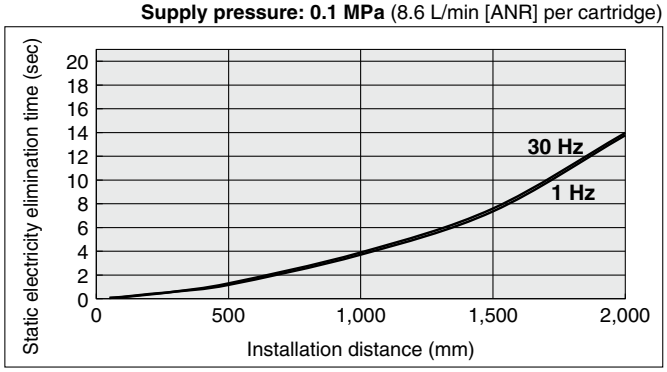
IZS42

1) Without air purge

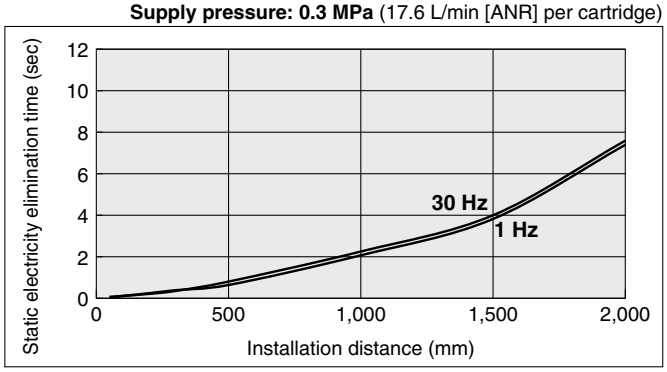


2) With high speed de-ionizing cartridge, With air purge

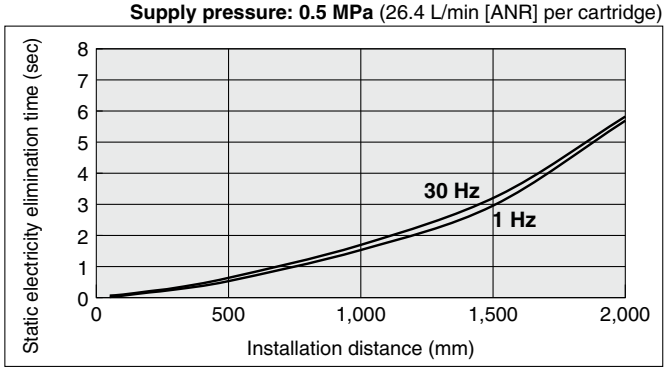
Supply pressure: 0.1 MPa (8.6 L/min [ANR] per cartridge)



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

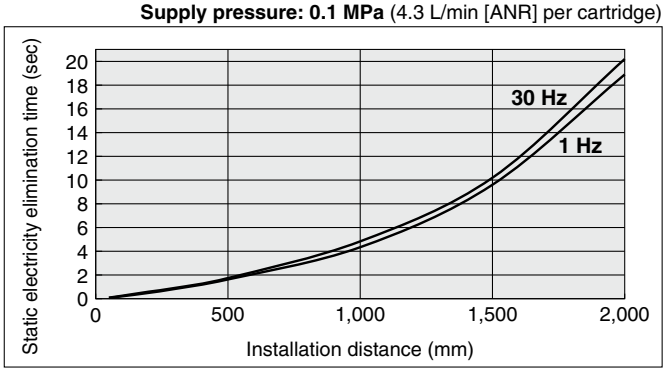


Supply pressure: 0.5 MPa (26.4 L/min [ANR] per cartridge)

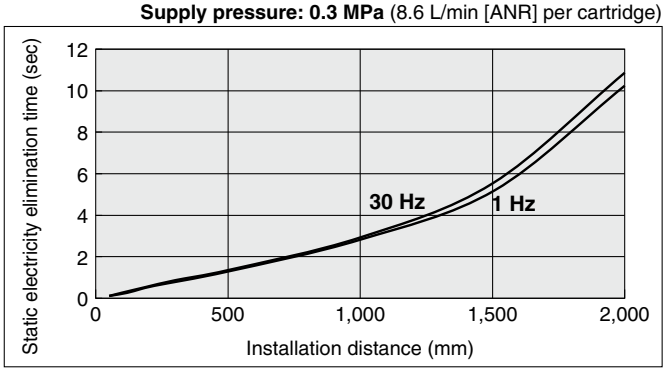


3) With energy saving type de-ionizing cartridge, With air purge

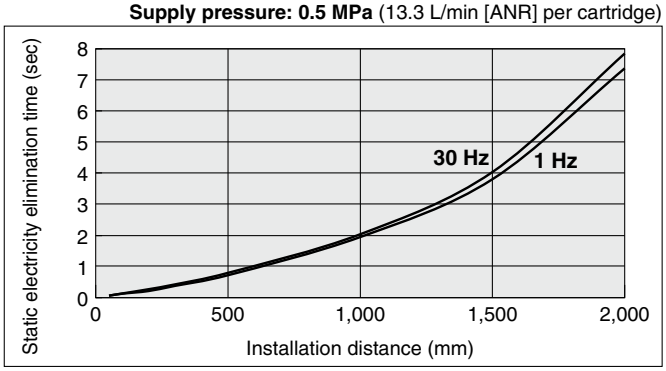
Supply pressure: 0.1 MPa (4.3 L/min [ANR] per cartridge)



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



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



Static Electricity Elimination Characteristics

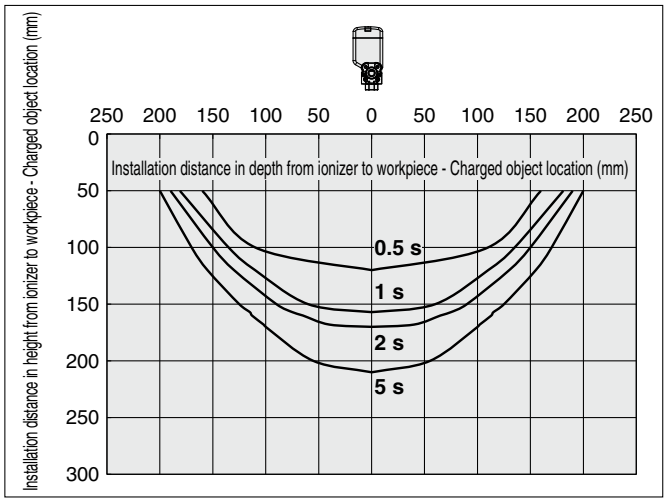
Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material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

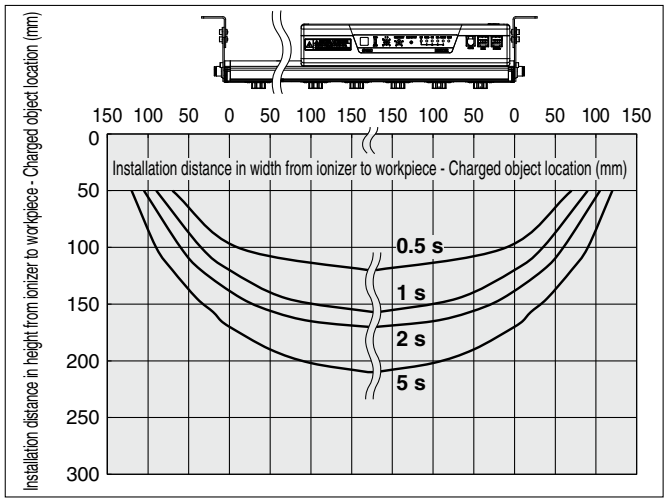
② Static Electricity Elimination Range

IZS40, 41

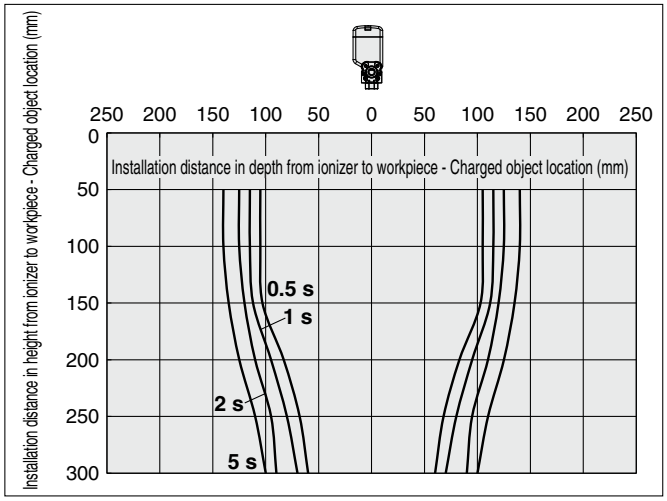
Frequency: 30 Hz

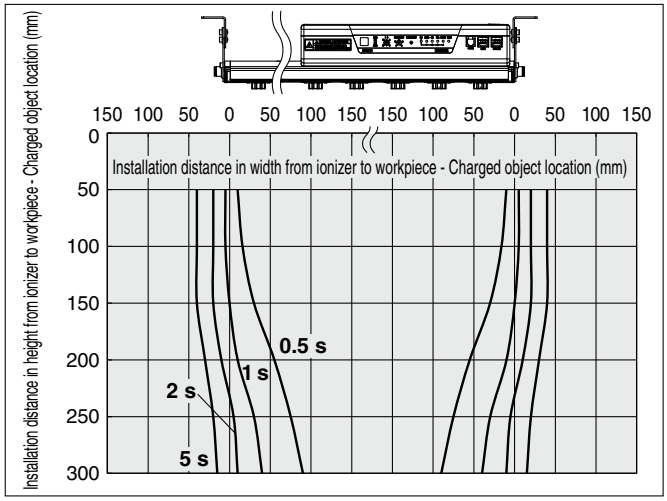
1) Supply pressure: 0 MPa



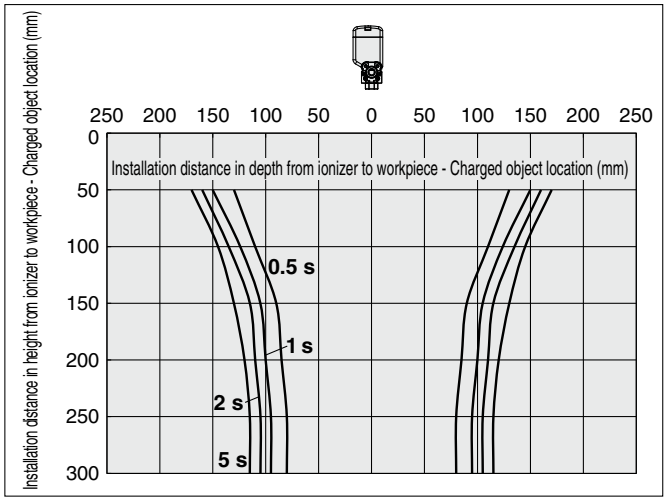


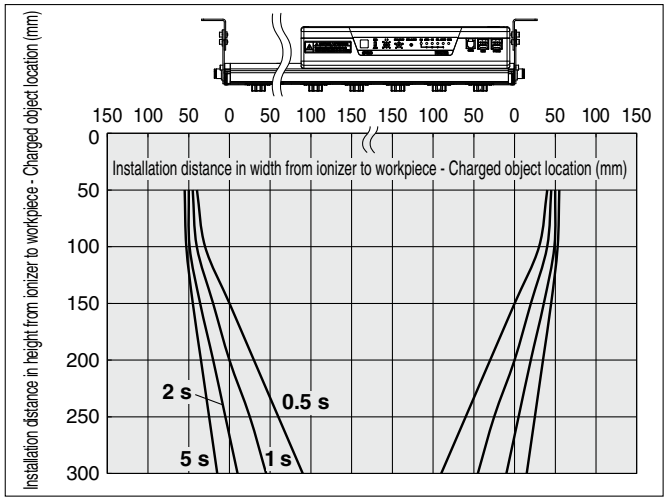
2) With high speed de-ionizing cartridge, Supply pressure: 0.3 MPa





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

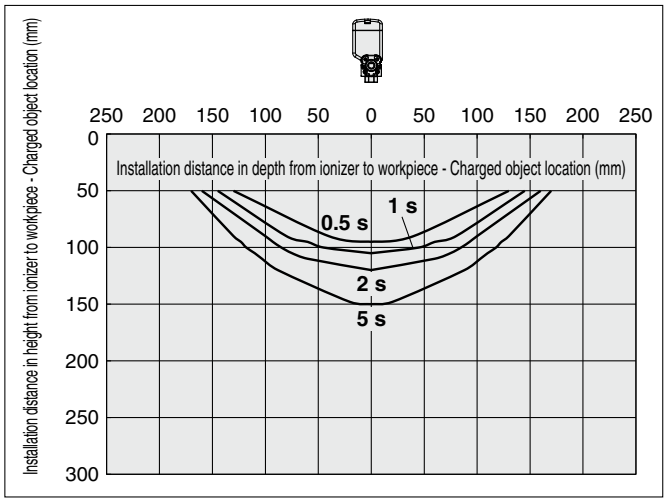


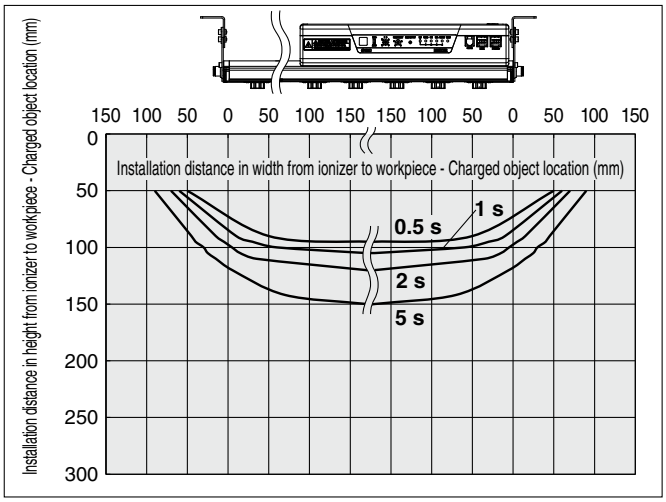


IZS42

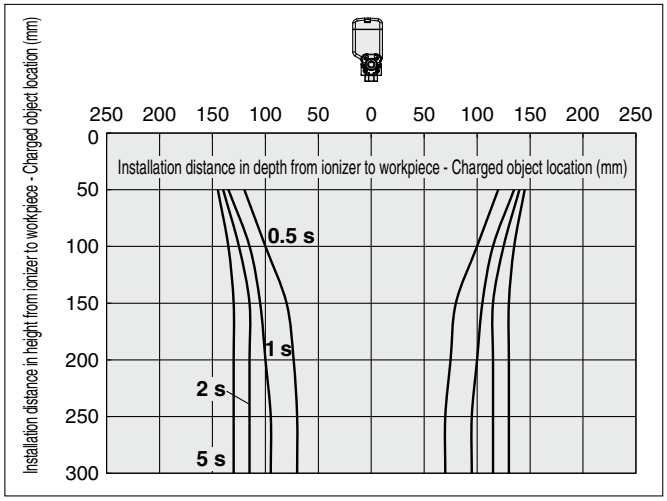
Frequency: 30 Hz

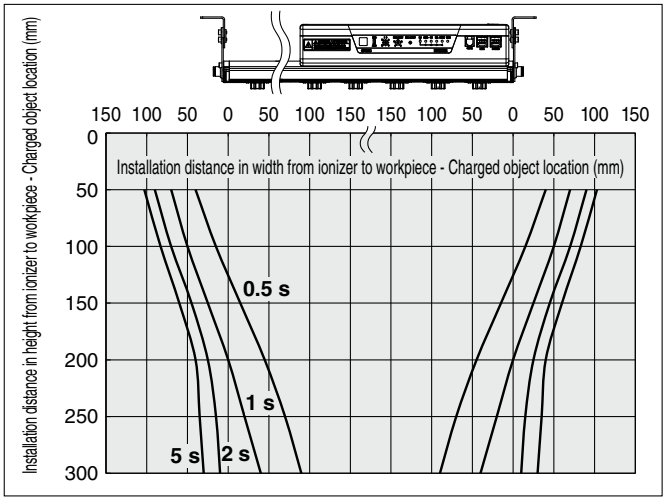
1) Supply pressure: 0 MPa



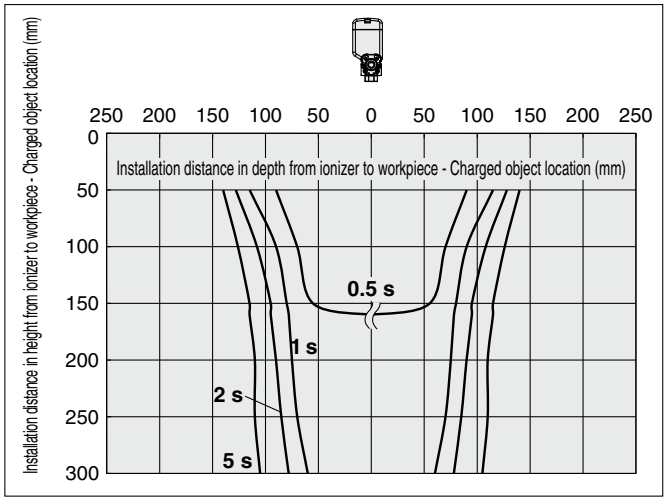


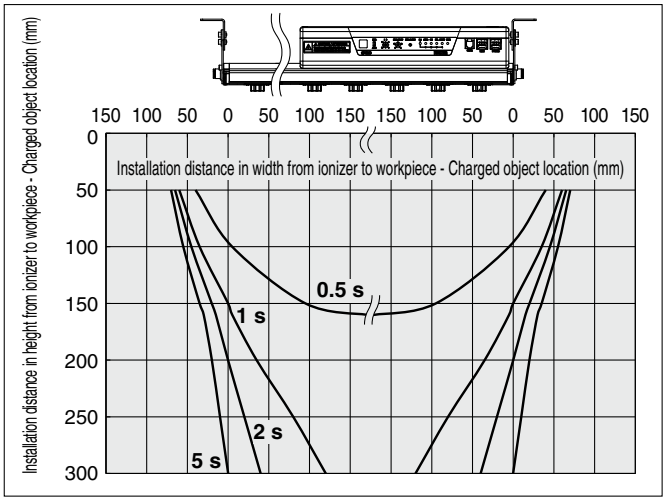
2) With high speed de-ionizing cartridge, Supply pressure: 0.3 MPa





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





Static Electricity Elimination Characteristics

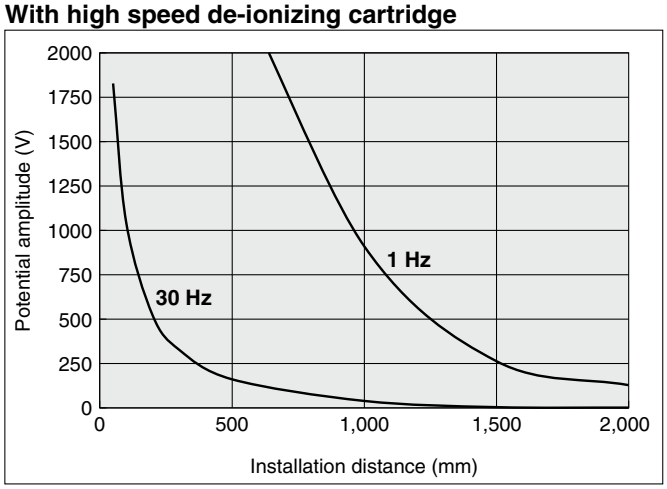
Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material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

③ Potential Amplitude

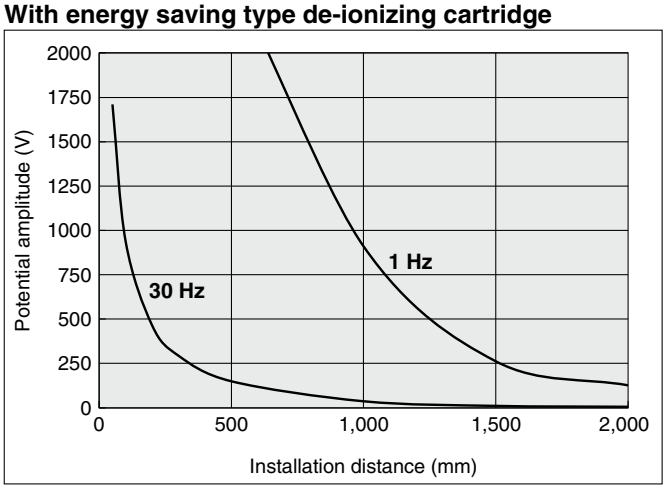
IZS40, 41

Supply pressure: 0.3 MPa, Frequency: 30 Hz

With high speed de-ionizing cartridge



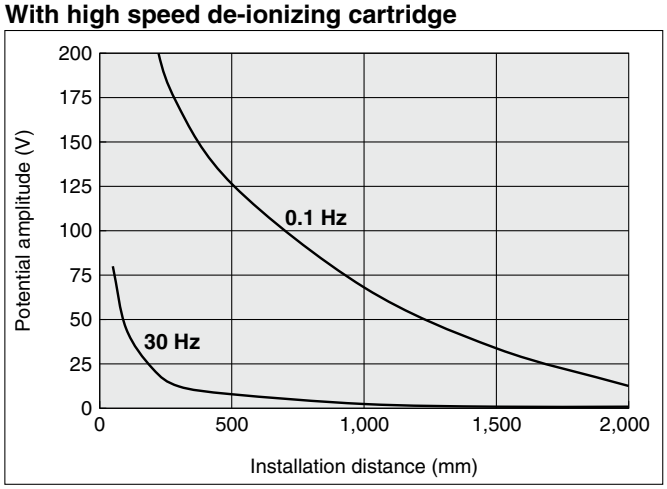
With energy saving type de-ionizing cartridge



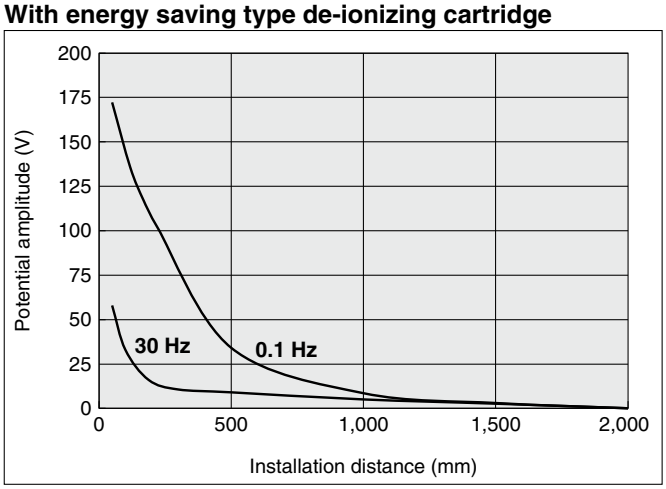
IZS42

Supply pressure: 0.3 MPa, Frequency: 30 Hz

With high speed de-ionizing cartridge

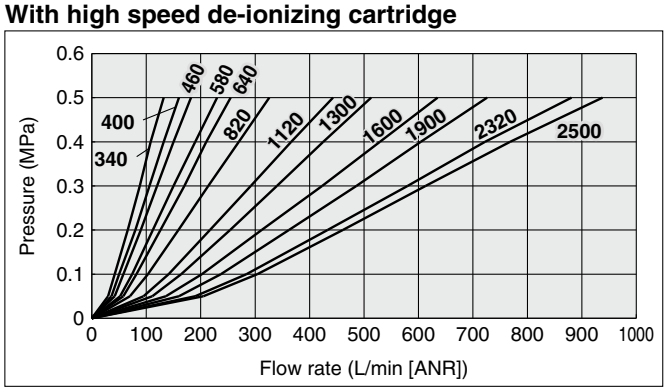


With energy saving type de-ionizing cartridge

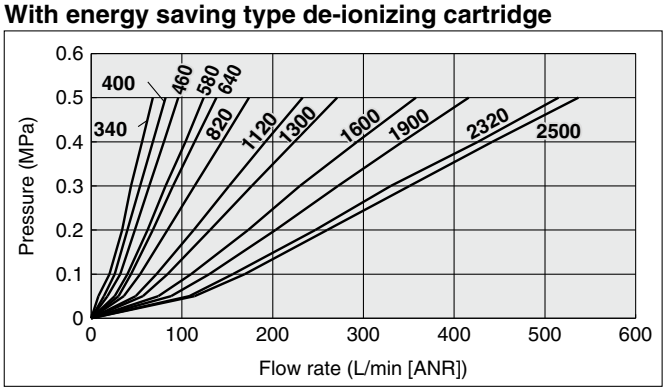


④ Flow Rate — Pressure Characteristics

With high speed de-ionizing cartridge

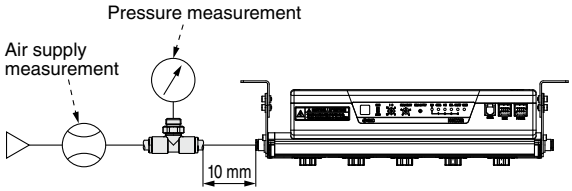


With energy saving type de-ionizing cartridge

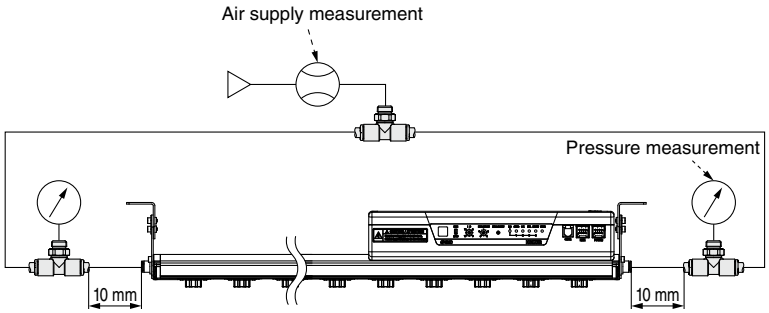


How to measure

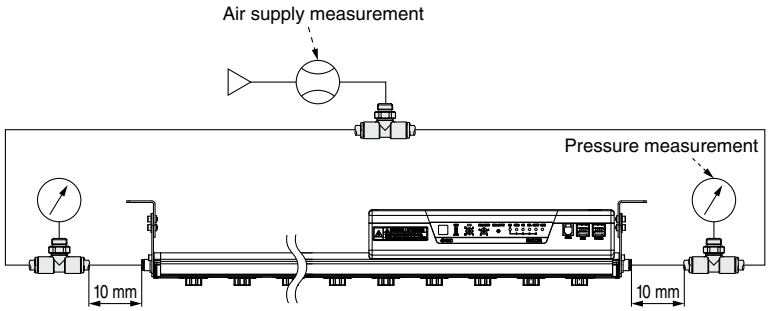
a) Single side air supply (Connecting tube: O.D. ø6 x I.D. ø4) (IZS4□-340, 400, 460, 580, 640)



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

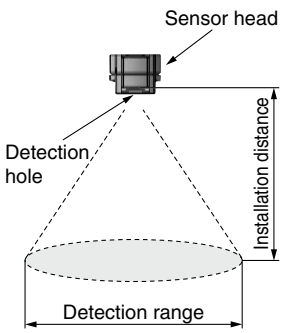


c) Both sides air supply (Connecting tube: O.D. ø8 x I.D. ø5) (IZS4□-1600, 1900, 2320, 2500)



Feedback Sensor Detection Range

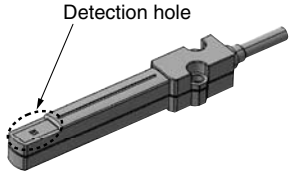
The relationship between the feedback sensor's installation distance and the detection range is as follows:



(mm)

Installation distance	Detection range
10	45
25	100
50	180

Enlarged view of sensor head



Ionizer

Series IZS40/41/42

How to Order

Type

40	Standard type

Type 40 IZS 40 – 1600 □ □ – 10 B – □

Type 41/42 IZS 42 – 1600 □ □ □ – 10 B □ – □

Bar type ● **Type** ● **Made to Order**

Type

41	Feedback sensor type
42	Dual AC type

Sensor

Symbol	Sensor	IZS41	IZS42
Nil	Built-in sensor	●	●
F	Feedback sensor	●	—
G	Auto balance sensor [High accuracy type]	●	●

∗ Feedback sensor cannot be used for the IZS42.

Electrode cartridge type/Electrode needle material

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

Bracket

Nil	Without bracket
B	With bracket*

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

Number of brackets

Bar length symbol	End bracket	Intermediate bracket
340 to 760	With 2 pcs.	None
820 to 1600		With 1 pc.
1660 to 2380		With 2 pcs.
2440 to 2500		With 3 pcs.

Bar length

Symbol	Bar length (mm)
340	340
400	400
460	460
580	580
640	640
820	820
1120	1120
1300	1300
1600	1600
1900	1900
2320	2320
2500	2500

Input/Output specifications

Nil	NPN
P	PNP

∗ Since input/output function cannot be used, specify "Nil" when the AC adapter is being used.

Power supply cable

Nil	With power supply cable (3 m)
Z	With power supply cable (10 m)
N	Without power supply cable

∗ When only an e-con connector for the IZS40 is required, specify "N", and order a part (Model: ZS-28-C) separately.

∗ To use AC adapter, specify "N", and select AC adapter sold separately (on page 10). (A cord is attached to the AC adapter.)

One-touch fitting

06	ø6 One-touch fitting
08	ø8 One-touch fitting
10	ø10 One-touch fitting

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

Recommended piping port size (mm)

One-touch fitting symbol	Applicable tube O.D. mm	Bar length symbol											
		340	**400**	**460**	**580**	**640**	**820**	**1120**	**1300**	**1600**	**1900**	**2320**	**2500**
06	**ø6**	○	○	○	○	○	●	●	●	—	—	—	—
08	**ø8**	—	—	—	—	—	○	○	○	●	●	●	●
10	**ø10**	—	—	—	—	—	—	—	—	○	○	○	○

○ : With piping on one side
● : With piping on both sides

Made to Order

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

Ordering example)

IZS 40 – 1660 □ □ – 10 B – X10

IZS 42 – 1660 □ □ □ – 10 B □ – X10

Type

41
42

Bar length

520	**1000**	**1420**	**1780**	**2140**
700	**1060**	**1480**	**1840**	**2200**
760	**1180**	**1540**	**1960**	**2260**
880	**1240**	**1660**	**2020**	**2380**
940	**1360**	**1720**	**2080**	**2440**

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

Specifications

Ionizer model		IZS40	IZS41-□□ (NPN)	IZS41-□□P (PNP)	IZS42-□□ (NPN)	IZS42-□□P (PNP)
Ion generation method		Corona discharge type				
Method of applying voltage		AC, DC	AC, Sensing AC, DC		Dual AC	
Applied voltage		±7,000 V			±6,000 V	
Ion balance Note)		±30 V				
Air purge	**Fluid**	Air (Clean dry air)				
	Operating pressure	0.5 MPa or less				
	Proof pressure	0.7 MPa				
	Connecting tube O.D.	ø6, ø8, ø10				
Current consumption		330 mA or less	440 mA or less (Sensing AC, Automatic run/Manual run: 480 mA or less)		700 mA or less (Automatic run/Manual run: 740 mA or less)	
Power supply voltage		24 VDC ±10% (100 to 240 VAC: AC adapter option)				
Power supply voltage in a transition wiring		—	24 VDC to 26.4 VDC			
Input signal	**Discharge stop signal**	—	Connected to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less	Connected to +24 V Voltage range: 19 VDC to power supply voltage Current consumption: 5 mA or less	Connected to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less	Connected to +24 V Voltage range: 19 VDC to power supply voltage Current consumption: 5 mA or less
	Electrode contamination detection signal					
Output signal	**Maintenance signal**	—	Max. load current: 100 mA Residual voltage 1 V or less (Load current at 100 mA) Max. applied voltage: 26.4 VDC	Max. load current: 100 mA Residual voltage 1 V or less (Load current at 100 mA)	Max. load current: 100 mA Residual voltage 1 V or less (Load current at 100 mA) Max. applied voltage: 26.4 VDC	Max. load current: 100 mA Residual voltage 1 V or less (Load current at 100 mA)
	Error signal					
Function		Incorrect high voltage ion discharge detection (Ion discharge stops during detection)	Ion balance control with the built-in sensor, electrode contamination detection, incorrect high voltage ion discharge detection (stops discharge during detection), ion discharge stop input, transition wiring, remote controller (sold separately), external sensor connection			
Effective de-ionizing distance		50 to 2000 mm	50 to 2000 mm (Sensing AC mode: 200 to 2000 mm, Manual run/Automatic run: 100 to 2000 mm)		50 to 2000 mm (Manual run/Automatic run: 100 to 2000 mm)	
Ambient and fluid temperature		0 to 40°C				
Ambient humidity		35 to 80% Rh (with no condensation)				
Material		Ionizer cover: ABS, Electrode cartridge: PBT, Electrode needle: Tungsten, Single crystal silicon				
Impact resistance		100 m/s²				
Standards/Directive		CE (EMC Directive: 2004/108/EC)				

Note) When the air purge is performed between a charged object and an ionizer at a distance of 300 mm

Number of electrode cartridges/Bar weight

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

External sensor

Sensor model	IZS31-DF (Feedback sensor)	IZS31-DG (Auto balance sensor) [High accuracy type]
Ambient temperature	0 to 50°C	
Ambient humidity	35 to 80% Rh (with no condensation)	
Case material	ABS	ABS, Stainless steel
Impact resistance	100 m/s²	
Weight	200 g (including cable weight)	220 g (including cable weight)
Installation distance	10 to 50 mm (Recommended)	—
Standards/Directive	CE, UL, CSA	

AC adapter (Sold separately)

Model	IZF10-CG□, IZS41-CG□
Input voltage	100 VAC to 240 VAC, 50/60 Hz
Output current	1 A
Ambient temperature	0 to 40°C
Ambient humidity	35 to 65% Rh (with no condensation)
Weight	220 g
Standards/Directive	CE, UL, CSA

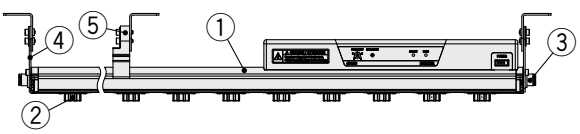
Remote controller (Sold separately)

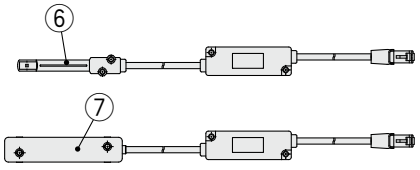
Model	IZS41-RC
Type	Infrared ray type
Transmission capacity	5 m Note 1)
Power supply	2 AAA sized batteries (sold separately) Note 2)
Ambient temperature	0 to 45°C
Ambient humidity	35 to 80% Rh (with no condensation)
Weight	33 g (excluding dry cell batteries)
Standards/Directive	CE

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

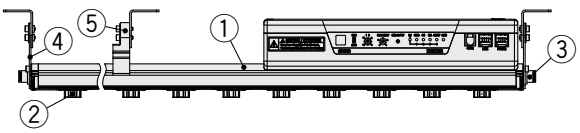
Construction

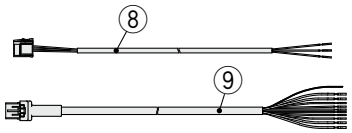
Series IZS40





Series IZS41/42





No.	Description
1	**Ionizer**
2	**Electrode cartridge**
3	**One-touch fitting**
4	**End bracket**
5	**Intermediate bracket**
6	**Feedback sensor**
7	**Auto balance sensor [High accuracy type]**
8	**Power supply cable (for IZS40)**
9	**Power supply cable (for IZS41/42)**

Accessories (for Individual Parts)

Feedback sensor
IZS31-DF

Auto balance sensor [High accuracy type]
IZS31-DG

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

For IZS40

For IZS41/42

Made to Order

How to Order

IZS□ – CP□ – X13

Type

40	For IZS40
41	For IZS41/42

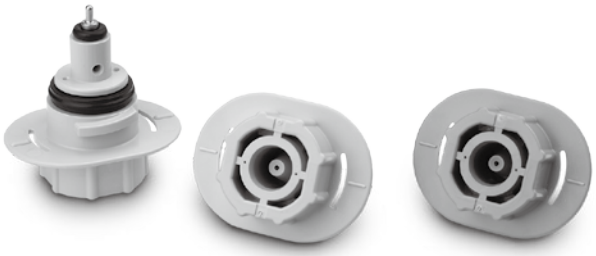
Power supply cable full length

Symbol	Cable full length
01	1 m
02	2 m
⋮	⋮
19	19 m
20	20 m

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

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

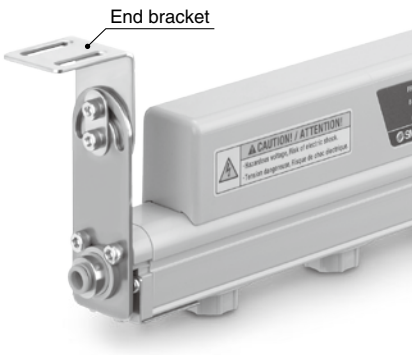
Energy saving type de-ionizing cartridge
- **IZS40-NJ (Material: Tungsten)**
- **IZS40-NK (Material: Silicon)**



Tungsten
(Cartridge color: White)

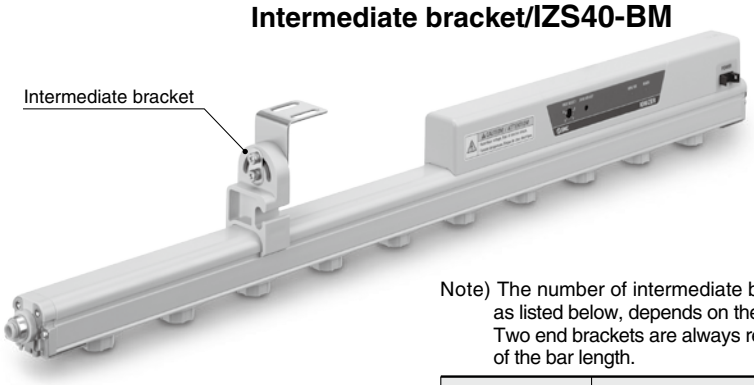
Silicon
(Cartridge color: Gray)

End bracket/IZS40-BE



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

Intermediate bracket/IZS40-BM



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

Bar length symbol	End bracket	Intermediate bracket
340 to 760	With 2 pcs.	None
820 to 1600		With 1 pc.
1660 to 2380		With 2 pcs.
2440 to 2500		With 3 pcs.

Note) The model number is for a single bracket.

Sold Separately

Electrode cartridge drop prevention cover

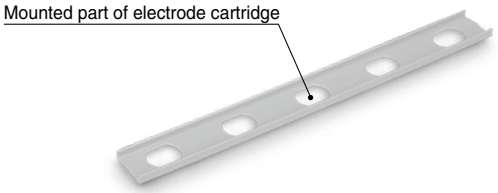
IZS40-E 3

● **Number of fixed electrode cartridges**

IZS40-E3	3
IZS40-E4	4
IZS40-E5	5

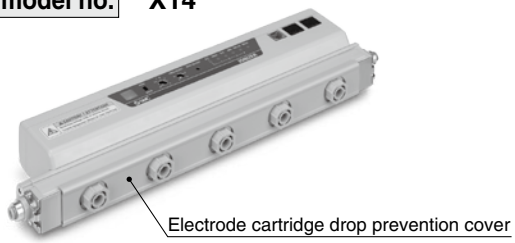
Number of required drop prevention covers

Bar length symbol	Number of required drop prevention covers		
	IZS40-E3	**IZS40-E4**	**IZS40-E5**
340	—	—	1
400	2	—	—
460	1	1	—
580	—	1	1
640	—	—	2
820	1	—	2
1120	1	—	3
1300	2	—	3
1600	2	—	4
1900	2	—	5
2320	1	—	7
2500	2	—	7



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

Standard model no. – X14



When attached to the body

Remote controller/IZS41-RC

AC adapter
For IZS40

IZF10-C

● **AC adapter**

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

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

For IZS40

For IZS41/42

IZS41-C

● **AC adapter**

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

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

For IZS41/42

Transition wiring cable

IZS41-CF

● **Transition wiring cable**

02	Full length 2 m
05	Full length 5 m
08	Full length 8 m

Made to Order

How to Order

IZS41-CF – X13

● **Transition wiring cable length**

Symbol	Cable full length
01	1 m
03	3 m
⋮	⋮
19	19 m
20	20 m

Model with Made-to-order transition wiring cable
Available in 1 m increments from 1 m to 20 m.
Note 1) 10 m or longer power cables are not CE Marking-compliant.
Note 2) Use standard power supply cables for 2 m, 5 m and 8 m lengths.
Note 3) Transition wiring is not possible for the IZS40.

Electrode needle cleaning kit/IZS30-M2

Wiring/IZS40

Wire cables according to the circuitry and wiring chart.

1. Grounding of F.G. cable

Make sure to ground the F.G. cable (green) with a resistance of 100 Ω or less.

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

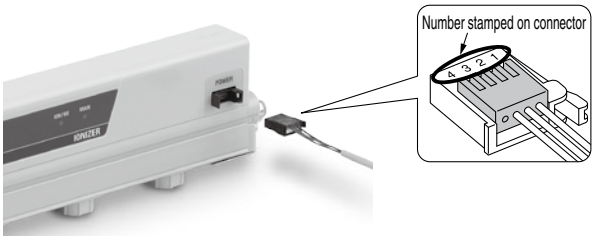
2. Connection circuit ("POWER" connector)

Wiring of the IZS40

e-con is adopted for the connector of the IZS40.

Connector with cable or without cable may be selected when placing an order for the power supply cable.

When only an e-con is required, place an order for it as a part. (Cable is not supplied.)

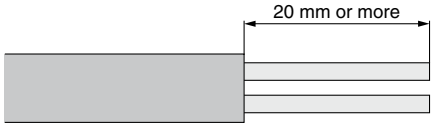


Wiring

Number stamped on connector	Description	Description
1	24 VDC	Power supply is connected to operate the ionizer.
2	GND	
3	F.G.	Make sure to ground with a resistance of 100 Ω or less to use it as a reference electric potential for ionizer.
4	—	Unused

How to connect the cable of the connector

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



Applicable wire

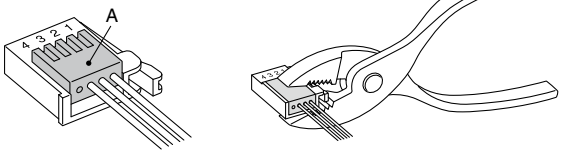
AWG No.	Conductor cross section mm²	Finish O.D. mm	Model
26-24	0.14-0.2	ø0.8-ø1.0	ZS-28-C

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

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

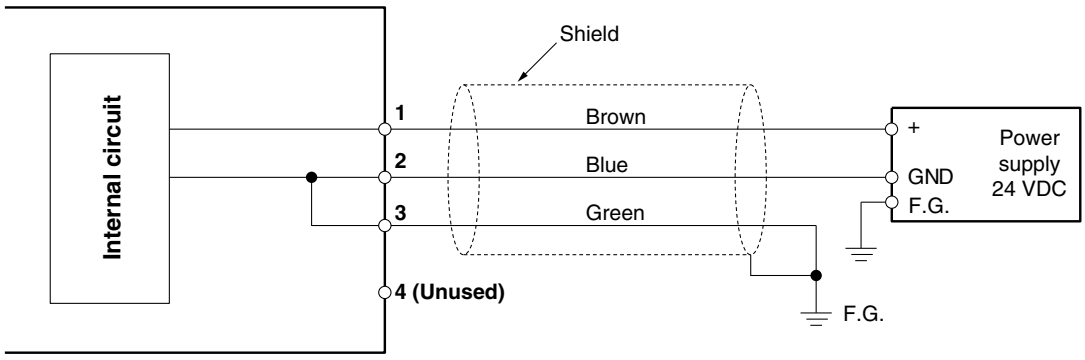
4) Use a tool such as pliers to firmly tighten the center of Part A.

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



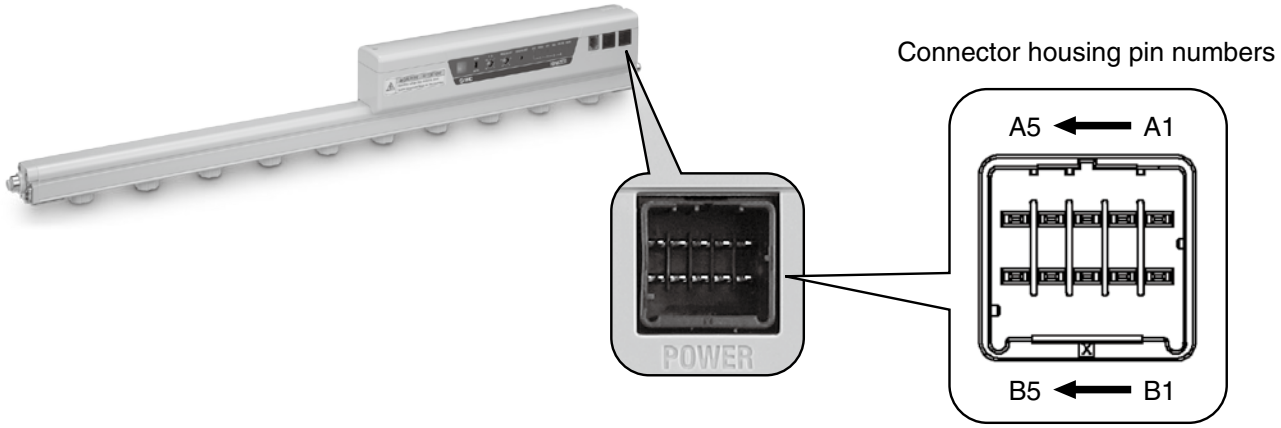
Connection Circuit/IZS40

Ionizer (IZS40)



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

Wiring/IZS41, 42

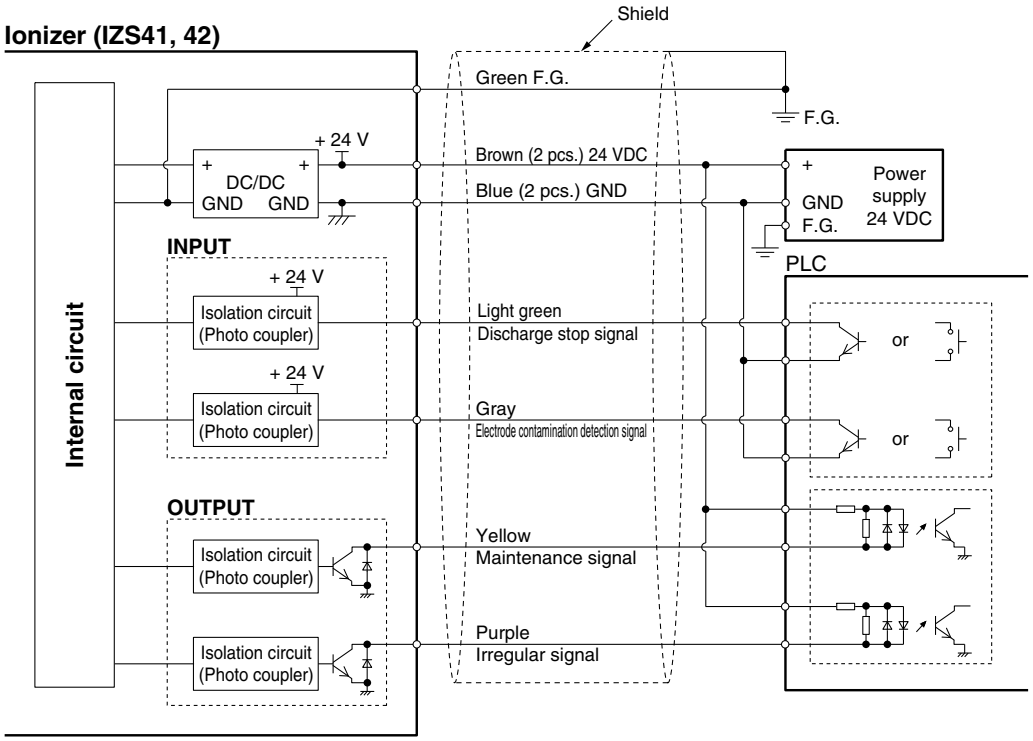


Wiring

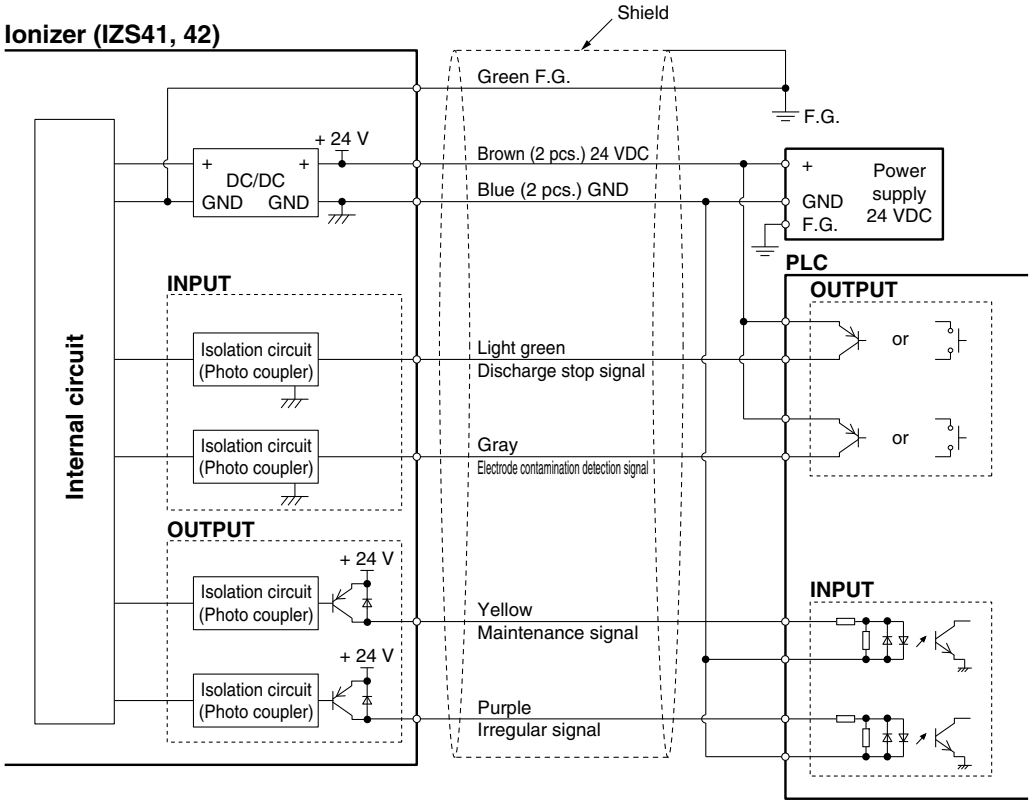
Pin no.	Cable color	Description	Signal direction	Description
A1	Brown	24 VDC	IN	Power supply is connected to operate the ionizer.
B1				
A2	Blue	GND	IN	
B2				
A3	Green	F.G.	—	Make sure to ground with a resistance of 100 Ω or less to use it as a reference electric potential for ionizer.
B3	Light green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

Wiring Circuit/IZS41, 42

NPN specification

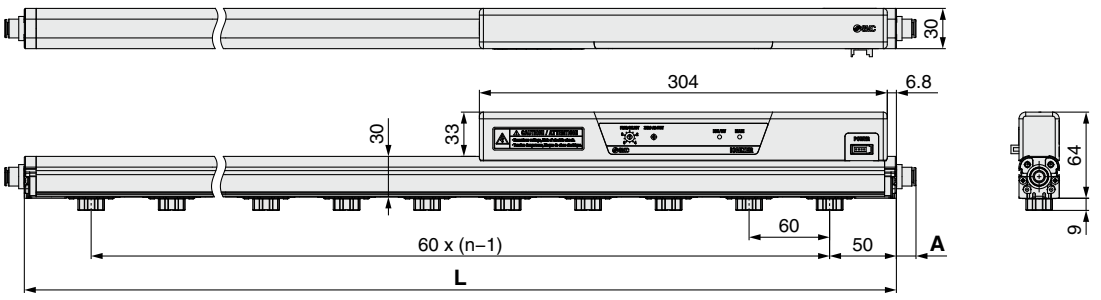


PNP specification



Dimensions

Ionizer/IZS40

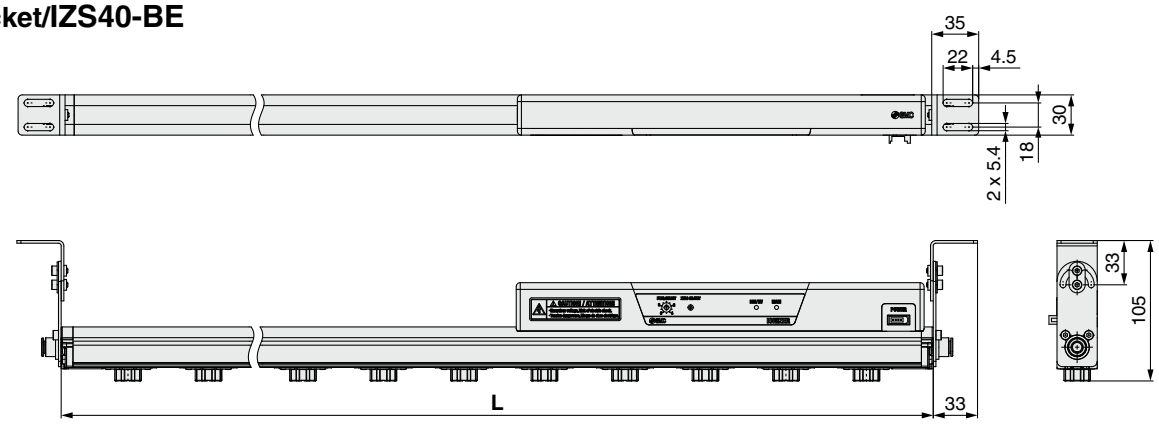


Applicable tube O.D.	**A**
06	13
08	15
10	22

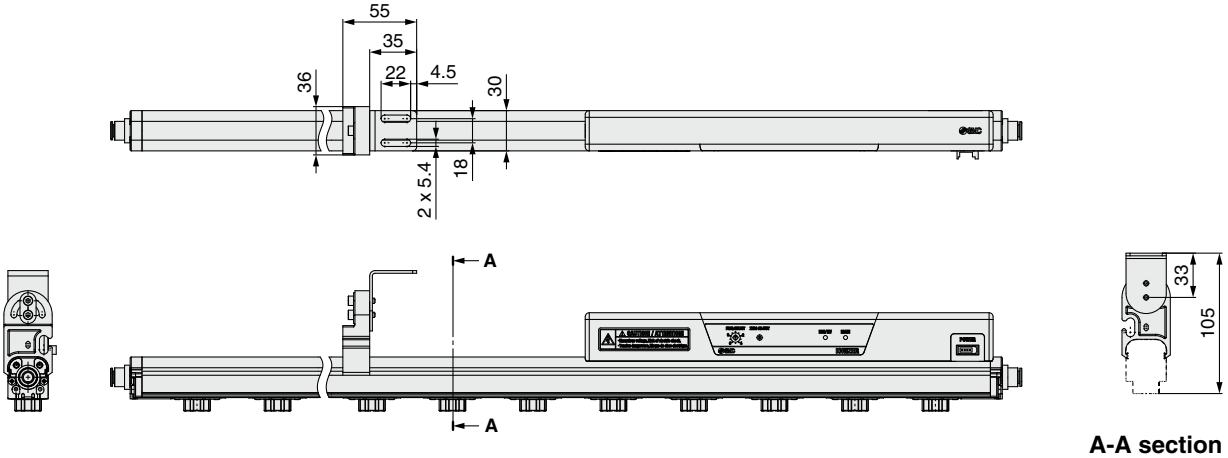
n (Number of electrode cartridges), L Dimension

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

End bracket/IZS40-BE



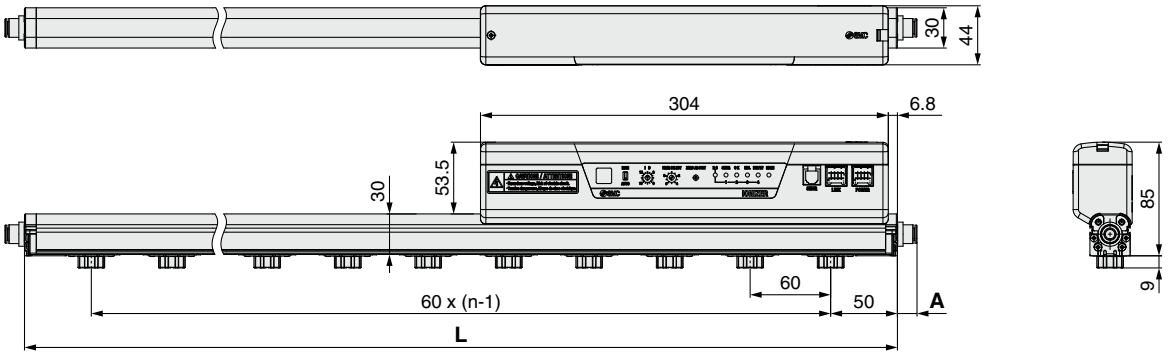
Intermediate bracket/IZS40-BM



A-A section

Dimensions

Ionizer/IZS41, 42

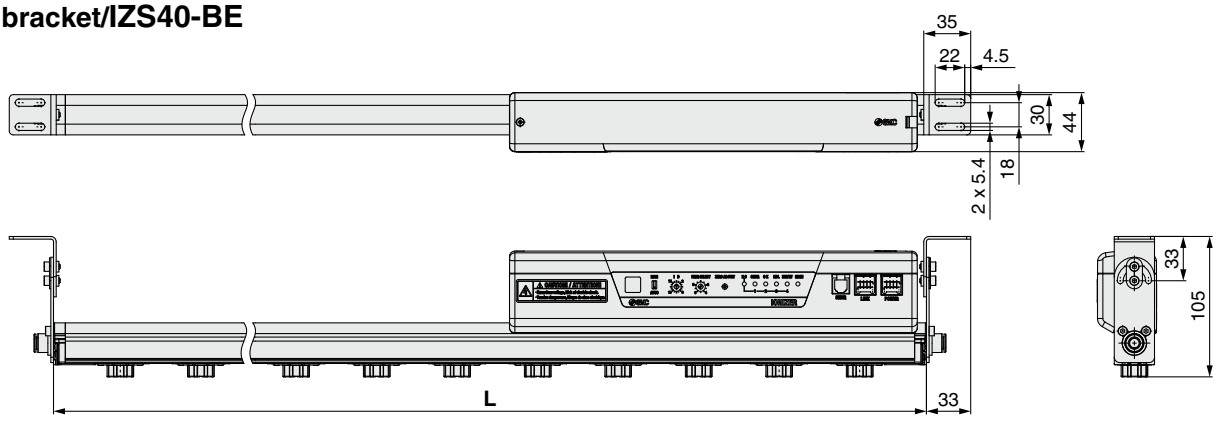


Applicable tube O.D.	A
06	13
08	15
10	22

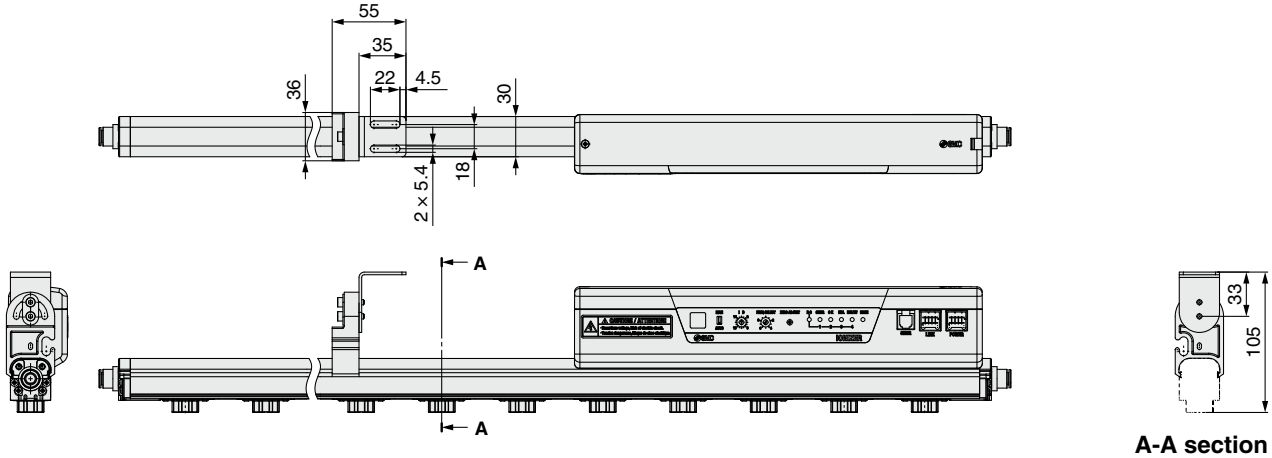
n (Number of electrode cartridges), L Dimension

Part no.	n	L (mm)
IZS4□-340	5	340
IZS4□-400	6	400
IZS4□-460	7	460
IZS4□-580	9	580
IZS4□-640	10	640
IZS4□-820	13	820
IZS4□-1120	18	1120
IZS4□-1300	21	1300
IZS4□-1600	26	1600
IZS4□-1900	31	1900
IZS4□-2320	38	2320
IZS4□-2500	41	2500

End bracket/IZS40-BE



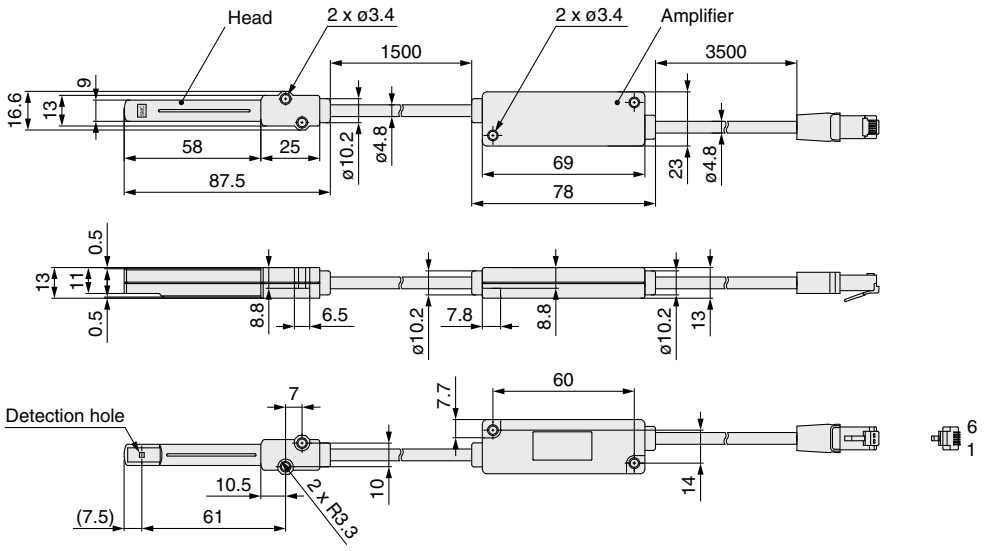
Intermediate bracket/IZS40-BM



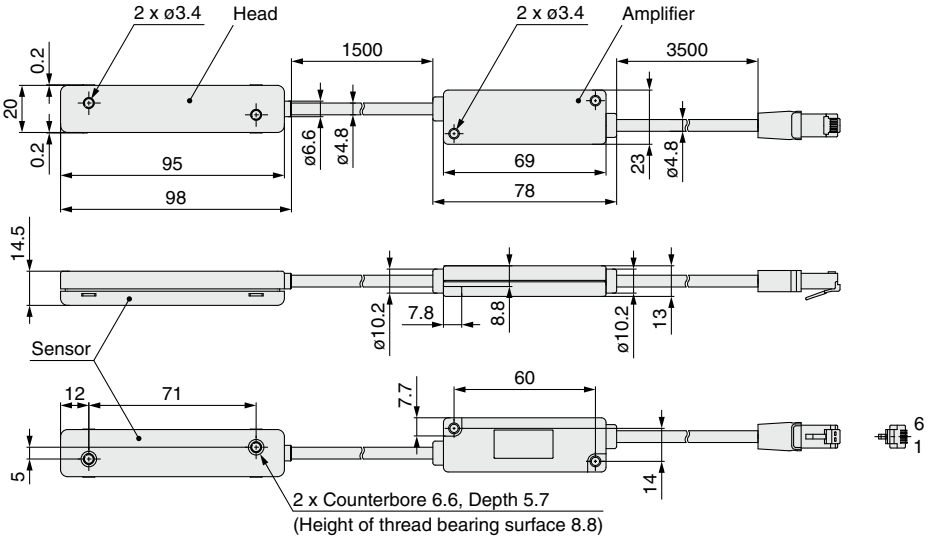
A-A section

Dimensions

Feedback sensor/IZS31-DF

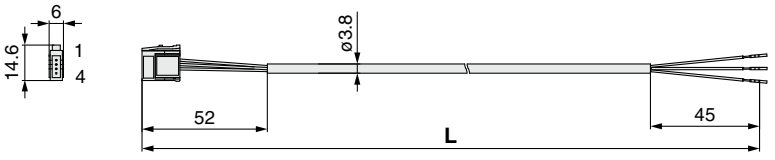


Auto balance sensor [High accuracy type]/IZS31-DG

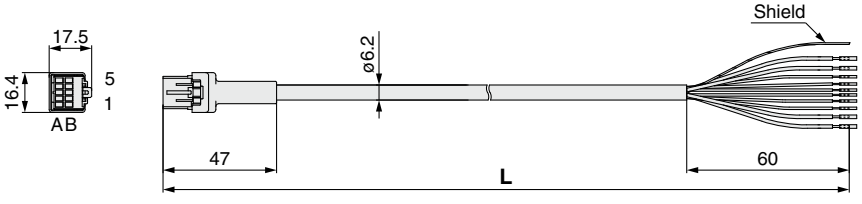


Power supply cable

IZS40-CP□



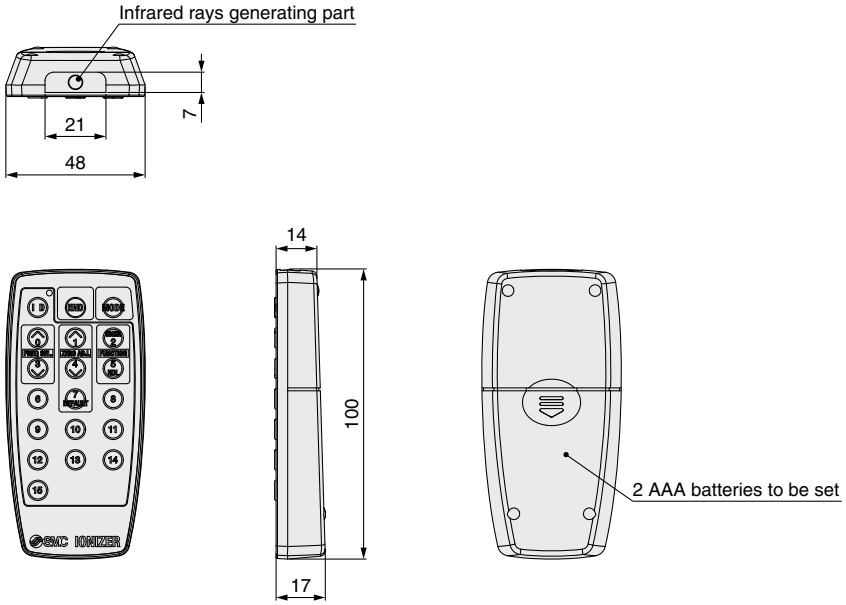
IZS41-CP□



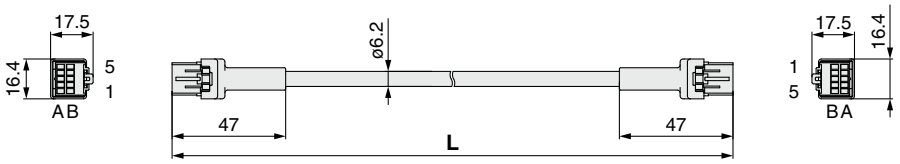
Part no.	**L** (mm)
IZS40-CP	3000
IZS41-CP	
IZS40-CPZ	9800
IZS41-CPZ	

Dimensions

Remote controller



Transition wiring cable/IZS41-CF□



Part no.	**L** (mm)
IZF41-CF02	2000
IZF41-CF05	5000
IZF41-CF08	8000

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

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

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

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

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

⚠Warning

1. **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
   Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
2. **Only personnel with appropriate training should operate machinery and equipment.**
   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
3. **Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.**
   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
4. **Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠Caution

1. **The product is provided for use in manufacturing industries.**
   The product herein described is basically provided for peaceful use in manufacturing industries.
   If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
   If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Series IZS40/41/42
Specific Product Precautions 1

Be sure to read this 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 on page 18), please consult SMC beforehand.

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

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

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

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

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

4. This product is not explosion-protected.

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

⚠Caution

1. Clean specification is not available with this product.

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

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 cable and tube minimum bending radius and avoid bending at acute angles.

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

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

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

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

2. Mount this product on a plane surface.

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

Mounting

⚠Warning

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

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

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

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

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

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

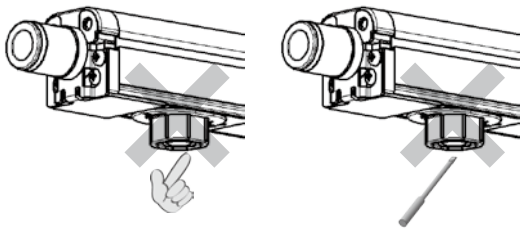
Refer to the operation manual for details.

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

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

⚠Danger High Voltage

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



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

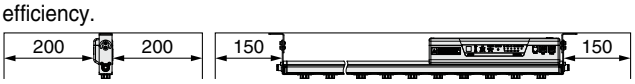
If the tape or seal contains any conductive adhesive or reflective paint, a dielectric phenomenon may occur due to ions arising from such substances, resulting in electrostatic charging or electric leakage.

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

⚠Caution

1. Install the IZS4□ series away from a wall as illustrated below.

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



Unit: mm

Specific Product Precautions 2

Be sure to read this before handling.

Mounting

⚠Caution

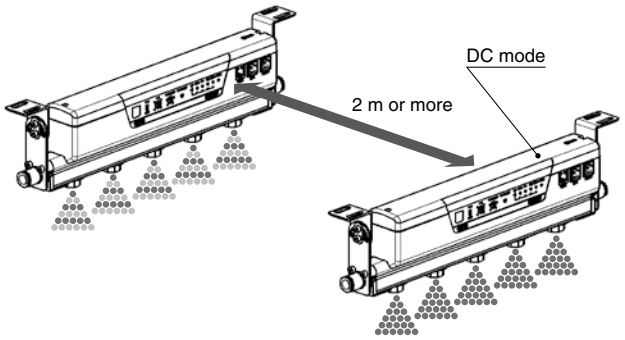
2. After installation, be sure to verify the effects of static electricity elimination.

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

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

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

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



Wiring/Piping

⚠Warning

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

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

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

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

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

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

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

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

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

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

Wiring/Piping

⚠Warning

11. Transition wiring of ionizer

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

The IZS41 and IZS42 can be connected in the same transition wiring, but mixed wiring of the NPN and PNP I/O specifications is not possible.

Please contact SMC when connecting conditions other than specified in the table below are applied.

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

Bar length symbol	Power supply cable length: 3 m										Power supply cable length: 10 m									
	Transition wiring cable length (same cable length) m										Transition wiring cable length (same cable length) m									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
340																				
400												7 units	6 units							
460				7 units																
580											8 units									
640																				
820	8 units					5 units			4 units					5 units				4 units		
1120																				
1300				6 units								6 units								
1600			7 units																	
1900											7 units									
2320																			3 units	
2500																				

Connectable number of ionizers (IZS42) with transition wiring (without external sensor)

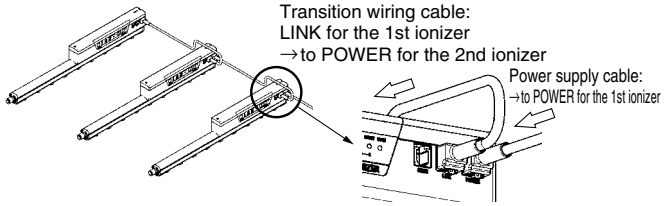
Bar length symbol	Power supply cable length: 3 m										Power supply cable length: 10 m									
	Transition wiring cable length (same cable length) m										Transition wiring cable length (same cable length) m									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
340																				
400																				
460																				
580																				
640																				
820			5 units				4 units				5 units			4 units				3 units		
1120																				
1300																				
1600																				
1900																				
2320									3 units											
2500																				

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

AC adapter must not be used when ionizer is used in a transition wiring.

When ionizers are connected with transition wiring, the same input signal serves as input to all the ionizers. When a signal is output from at least one ionizer in the connection, the signal will be output from the power supply cable.

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



Specific Product Precautions 3

Be sure to read this before handling.

Operating Environment/Storage Environment

⚠Warning

1. Observe the fluid temperature and ambient temperature range.

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

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

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

3. Environments to avoid

Avoid using and storing this product in the following environments since they may cause damage to this product.

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

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

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

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

Maintenance

⚠Warning

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

Periodically inspect the electrostatic sensor to check if it is operated while being out of order. Only a person having an adequate knowledge and experience about the system is allowed to inspect the sensor. If particles attach to the electrode needle by using for long periods of time, the static electricity eliminating performance will be lowered.
Replace the electrode cartridge, if the pins are rough and the static electricity eliminating performance does not return even after being cleaned.

⚠Danger High Voltage

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

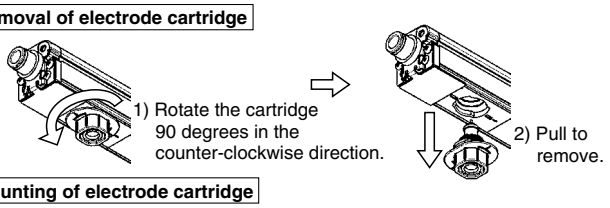
Maintenance

⚠Warning

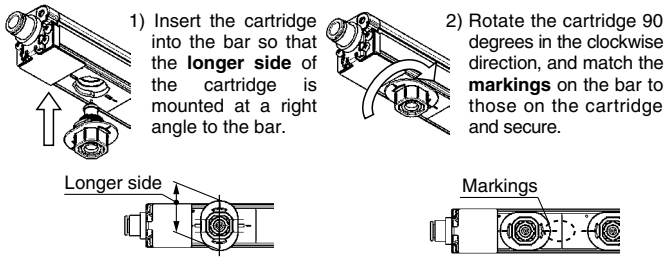
2. When cleaning the electrode needle or replacing the electrode cartridge, be sure to turn off the power supply or air supply to the body.

Touching an electrode needle when it is electrified may result in electric shock or other accidents.
If the electrodes are touched while the product is energized, this may cause an electric shock or accident.
If an attempt to replace the cartridges is performed before removing air supply, the cartridges may eject unexpectedly due to presence of the supply air. Remove air supply before replacing the cartridges. If cartridges are not securely mounted to the bar, they may eject or release when air is supplied to the product. Securely mount or remove the cartridges referencing the instructions shown below.

Removal of electrode cartridge



Mounting of electrode cartridge



3. Perform the detection procedure in the absence of workpieces. (IZS41, 42)

4. 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 excercise caution because the product will not be warrantied.

5. Do not operate this product with wet hands.

Otherwise, an electrical shock or accident may occur.

Handling

⚠Caution

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

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

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

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

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

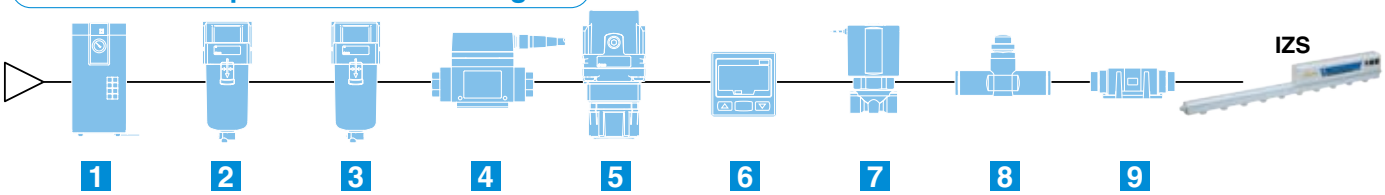
If the modular plug is at a difficult angle to attach/detach, the jack's mounting section may be damaged and cause a disorder.

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 matter such as powder particles in the compressed air.

3 Mist Separator/Series AFM

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

4 Digital Flow Switch/Series PF2A

Decreases the air consumption by flow control.

2-Color Display Digital Flow Switch/Series PFM

5 Regulator/Series AR

Decreases the air consumptionby setting to an appropriate pressure.

6 Digital Pressure Switch/Series ISE30A

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

7 2 Port Solenoid Valve/Series VX

Pilot Type 2 Port Solenoid Valve for Dry Air/Series VQ

8 Restrictor/Series AS-X214

Regulates to the appropriate air volume depending upon the installation condition. Decreases the air consumption.

9 Clean Air Filter/Series SFD

Built-in capillary element nominal filtration rating: 0.01 μm
Hollow fiber elements with over 99.99% filtering efficiency do not contaminate work pieces.

Ionizer Series Variations

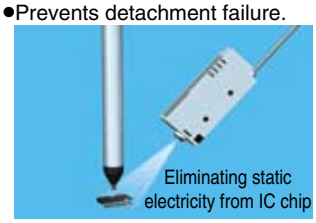
Ionizer/Nozzle type *Series IZN10*

Dust removal and static electricity elimination by air blow

●Eliminates dust clinging to lamp cover.

Spot type static electricity elimination

●Prevents electrostatic breakdown of electric parts.
●Prevents detachment failure.



Ion balance ±10 V (In case of energy saving static electricity elimination nozzle)

Slim design: Thickness dimension 16 mm

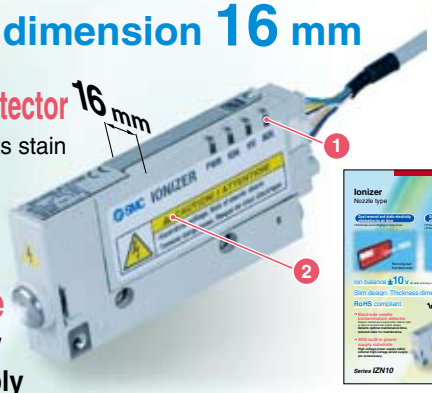
① Electrode needle contamination detector

Outputs maintenance signal when detects stain or wear of an electrode needle always.

Detects optimal maintenance time, reduced labor for maintenance.

② Built-in power supply substrate

High-voltage power supply cable/ external high-voltage power supply are unnecessary.

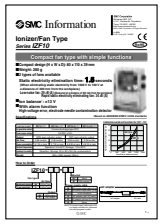


CAT.ES100-72

Ionizer/Fan type *Series IZF10*

Compact fan type with simple functions

- **Compact design: 80 x 110 x 39 mm**
- **Weight: 280 g**
- **2 types of fans available**
  - ◎**Static electricity elimination time: 1.5 seconds** (When eliminating static electricity from 1000 V to 100 V at a distance of 300 mm from the workpiece)
  - ◎**Low-noise fan: 48 dB (A) (Measured at a distance of 300 mm from the workpiece) Rapid static electricity eliminating fan: 57 dB (A)**
- **Ion balance*: ±13 V**
  * Based on ANSI/ESD-STM3.1-2006 standards
- **With alarm function**
  High-voltage error, electrode needle contamination detector



11-E574

Electrostatic Sensor *Series IZD10*/Electrostatic Sensor Monitor *Series IZE11*

Electrostatic Sensor *Series IZD10*

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

- **Potential measurement: ±20 kV (detected at a 50 mm distance) ±0.4 kV (detected at a 25 mm distance)**
- **Detects the electrostatic potential and outputs in an analog voltage.**
  ·Output voltage: 1 to 5 V (Output impedance: Approx. 100 Ω)
- **Broadens your coverage of electrostatic potential measurement applications.**

Electrostatic Sensor Monitor *Series IZE11*

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

CAT.ES100-65

Handheld Electrostatic Meter *Series IZH10*

The importance of the static electric control is put on confirming the "actual status".
Easy-to-use handheld electrostatic meter

- **Measurement range: ±20.0 kV**
- **Minimum display unit: 0.1 kV (±1.0 to ±20.0 kV) 0.01 kV (0 to ±0.99 kV)**
- **Compact and lightweight: 85 g (excluding dry cell batteries)**
- **Backlight for reading in the dark**
- **LOW battery indicator**
- **Peak/Bottom value indication**
- **Zero-clear function**
- **Auto power-off function**

CAT.ES100-69

SMC Corporation

Akihabara UDX 15F,
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN
Phone: 03-5207-8249 Fax: 03-5298-5362
http://www.smcworld.com

Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

D-DN

1st printing QX printing QX 8150SZ Printed in Japan.

Ionizer

New

RoHS

3 types of the sensors are available.

- **Autobalance sensor [High-precision type]**
  Adjusts ion balance near the workpiece to reduce any disturbance interference!

New

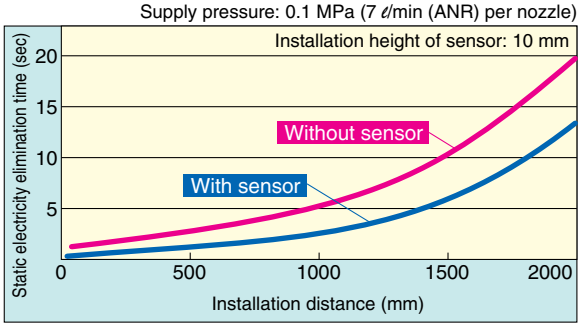
- **Autobalance sensor [Body-mounting type]**

- **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
(150 mm x 150 mm, capacitance 20 pF)
Installation distance: 200 mm (Tungsten electrode needle 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.

Series IZS31

SMC

CAT.ES100-68C

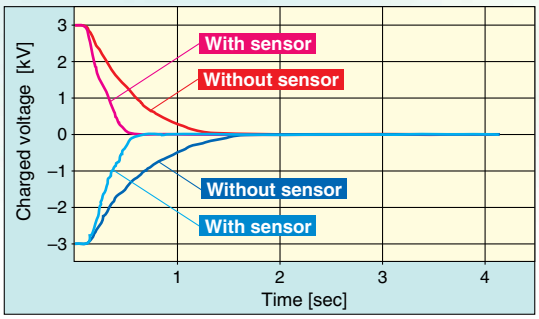
Feedback sensor / **Rapid elimination of static electricity**

Feedback sensor

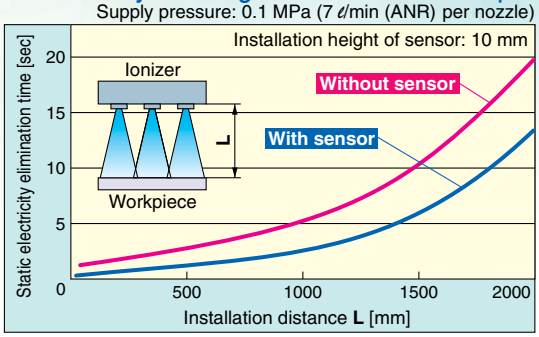
Detects the polarity of a discharged object and measures the charged voltage.

Rapid elimination of static electricity by a feedback sensor

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



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

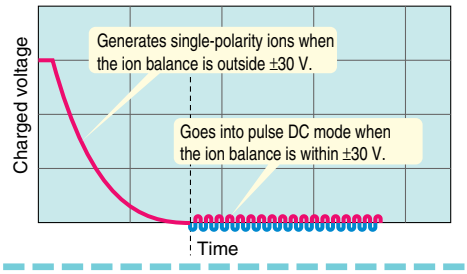


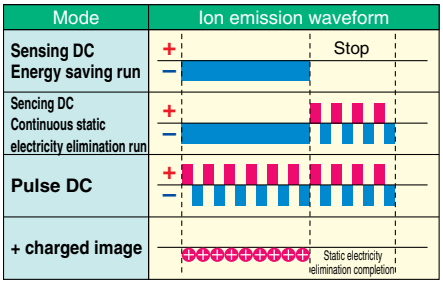
- Run mode after static electricity elimination (ion balance: within ±30 V) can be selected.

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

Note) The pneumatic valve must be separately procured.

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



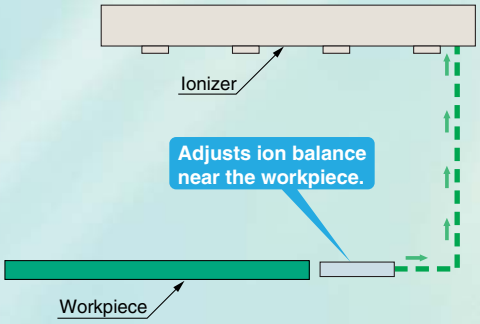


Autobalance sensor /
Reduction in adjustment and maintenance man-hours

Autobalance sensor
Measures the ion balance condition.

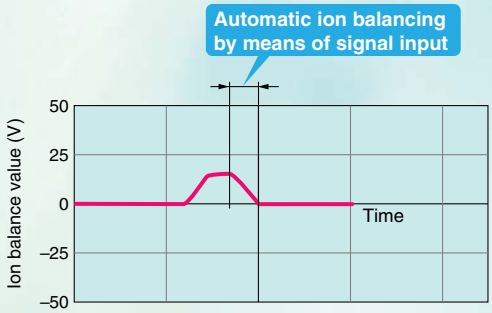
Autobalance sensor [High-precision type]

- The ion balance near the workpiece is accurately adjusted.
- The object is not affected by the height of installation or any disturbance interference.



- "Ion balance adjustment at external signal input" or "Ion balance adjustment at any time" can be selectable.

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

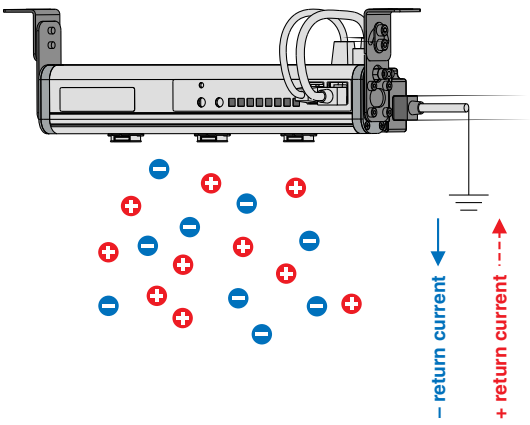


New

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

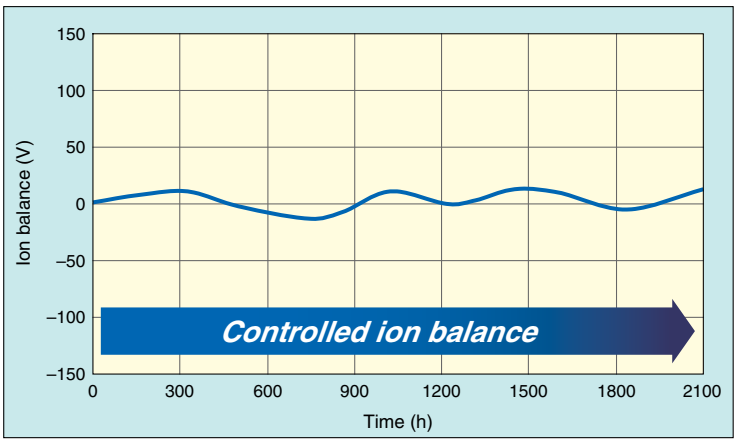
Monitoring the amount of ion emitted from an ionizer, the autobalance sensor maintains the initial ion balance by adjusting the +/– ion supply rate.

Autobalance sensor [Body-mounting type]



Monitoring +/– return current

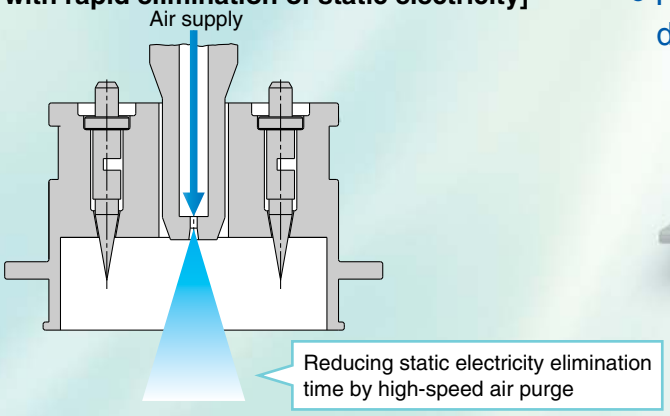
● Ion balance



Electrode cartridge variations

Electrode cartridge with rapid elimination of static electricity, focusing on static electricity elimination time and energy saving

[Electrode cartridge with rapid elimination of static electricity]

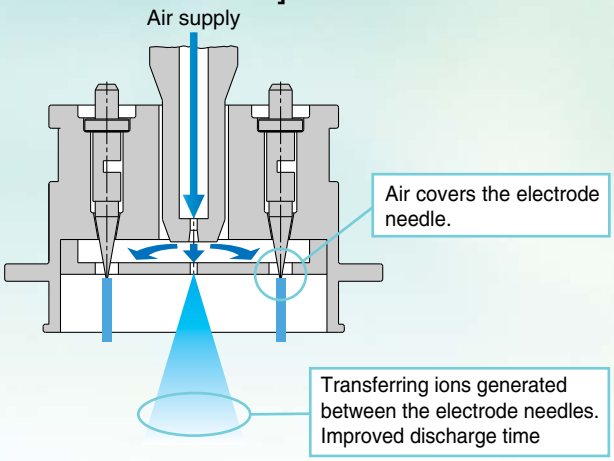


- High-efficiency nozzle design improves discharge time with low air consumption.

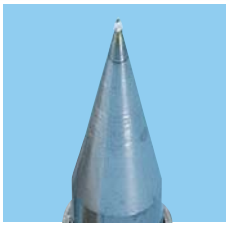
New

Electrode cartridge with low maintenance, focusing on ion balance and reducing maintenance time

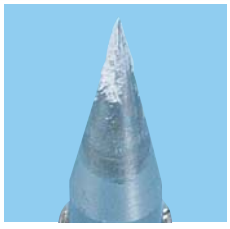
[Electrode cartridge with low maintenance]



- Stain on electrode needle is reduced by compressed air.



Electrode cartridge with low maintenance
Reduces stain on electrode needle.



Conventional needle
Needs regular maintenance.

3 types of electrode needle materials

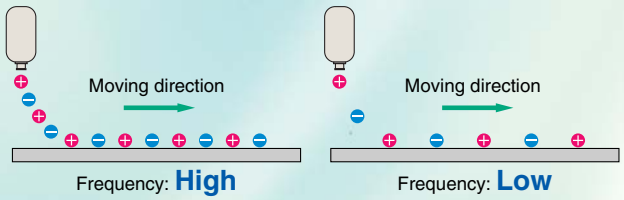
- Tungsten: Ion balance ±30 V
- Monocrystal silicon: Ion balance ±30 V, suitable for eliminating static electricity of silicon wafer
- Stainless steel*: Ion balance ±100 V, low-cost type, suitable for environments sensitive to heavy metal contamination such as food processing

* Only for electrode cartridge with rapid elimination of static electricity

Applicable to workpiece moving at high speed

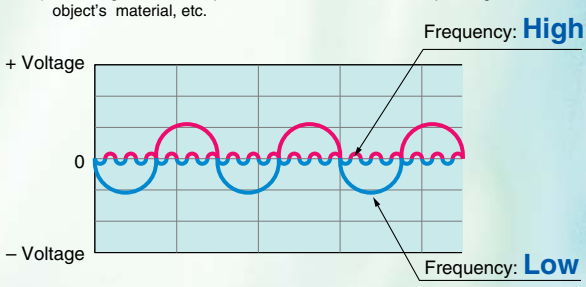
- Switching over frequency: Max. **60** Hz

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 elimination.

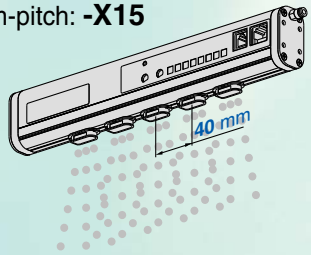
Note) The range of surface potential fluctuations varies depending on the object's material, etc.

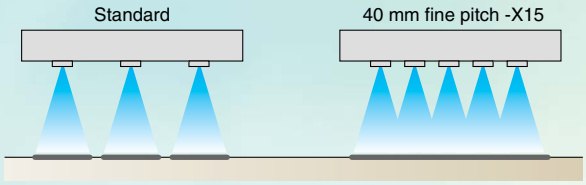


Effective static electricity elimination for short distance

- Prevention of irregular static electricity elimination

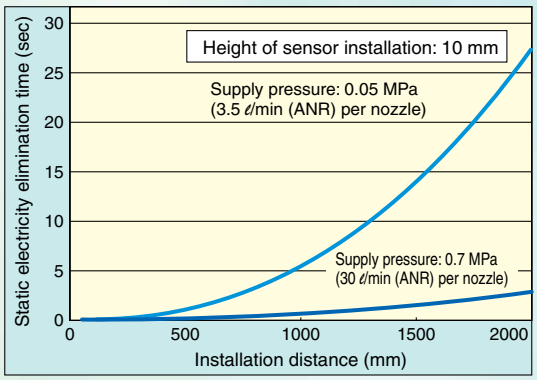
Electrode cartridge 40 mm-pitch: **-X15**
(Standard: 80 mm-pitch)
(Length: 1260 mm or less)
Note) 80 mm-pitch in case of air purge





Applicable to purge pressure of 0.7 MPa

Air purge: Yes, With sensor: 1 Hz/60 Hz



Indicator functions

- Visualization of charging condition

(During sensing DC mode)

Workpiece electric polarity	LED + OK -	Workpiece electric charge voltage	
Positive		+400 V or higher	Light ON
↑		+100 V to +400 V	
Static electricity elimination completion		+30 V to +100 V	Flash at 4 Hz
		Within ±30 V	
		–30 V to –100 V	Light OFF
↓		–100 V to –400 V	
Negative		–400 V or lower	

- Visualization of ion balance

(When pulse DC mode or autobalance sensor are used.)

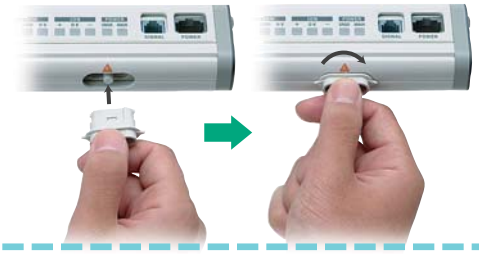
Contamination of electrode needle can be checked at the same time.

Light ON: Within ±30 V
Flash: Around ±30 V
Light OFF and Alarm output: Adjustment is not possible.

Safety functions

- Electrode cartridge drop prevention

Locking by double-action

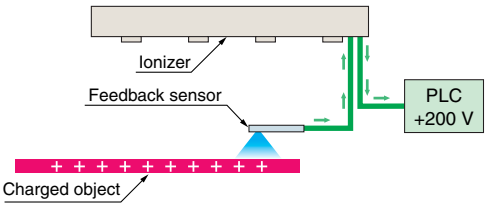


Continuous ion emission of a desired polarity during DC mode

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

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.



- Security cover

Can even more reliably prevent electrode cartridges from dropping off.

Made to Order

Ionizer / Series IZS31

Symbol	Contents	Specifications
X10	Non-standard bar length Model with 80 mm-pitch electrode cartridges	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) Note) Maximum bar length is 1260 mm. The air purge nozzles are arranged at an 80 mm-pitch.
New X210	High-voltage/control unit detachable short type Model with 80 mm-pitch electrode cartridges	A short type ionizer (full length of 180 mm and 220 mm) can be installed in a small space. The high-voltage unit (ionizing unit) and control unit are detachable from each other. The distance between them is also optional according to the length of selected connection cables.
New X211	High-voltage/control unit detachable short type Model with 40 mm-pitch electrode cartridges	

Power supply cable

X13	Non-standard power supply cable length	Power supply cable full length: 1 m to 20 m

AC adapter

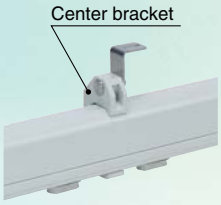
New X196	Ionizer driving AC adapter	Input voltage: 100 V to 240 V, Output voltage: 24 VDC

Variations

Bracket

End bracket

Center bracket



Bar length (mm)

300, 380, 620, 780, 1100, 1260, 1500, 1900, 2300

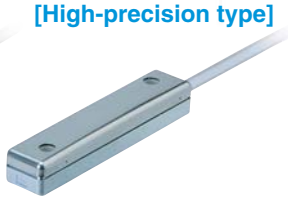
Power supply cable

3 m,10 m

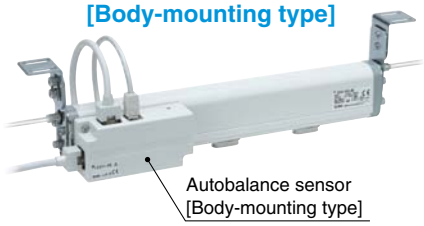
Sensor

Feedback sensor

Autobalance sensor [High-precision type]



Autobalance sensor [Body-mounting type]



Electrode cartridge

Electrode cartridge with rapid elimination of static electricity

Electrode needle material
- Tungsten
- Silicon
- Stainless steel

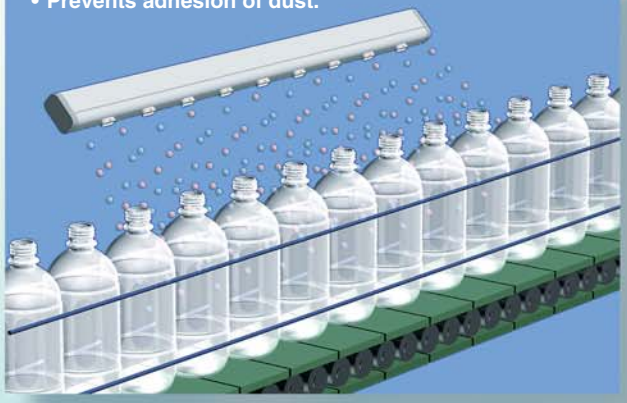
Electrode cartridge with low maintenance

Electrode needle material
- Tungsten
- Silicon

Application Examples

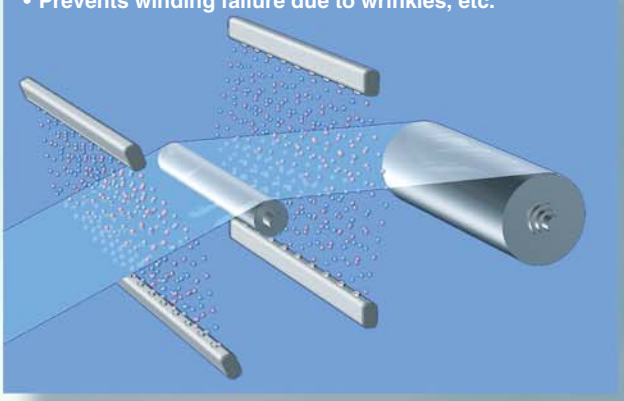
Eliminating static electricity on PET bottles

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



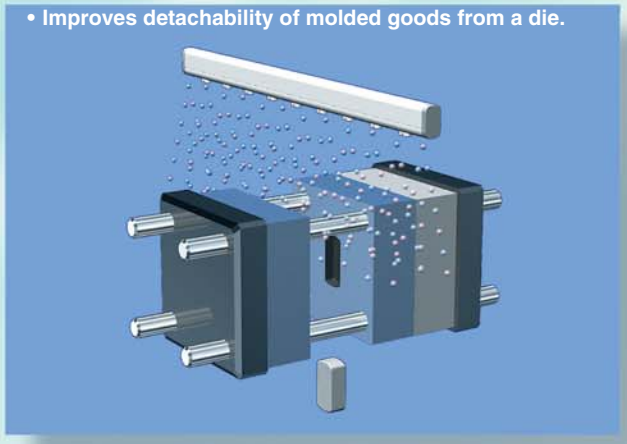
Eliminating static electricity on a film

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



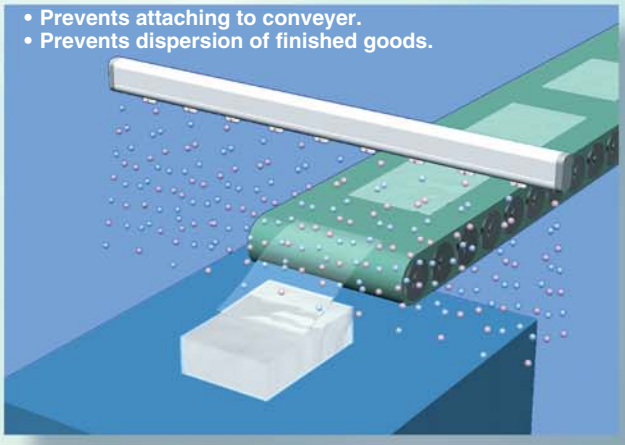
Eliminating static electricity on molded goods

- Improves detachability of molded goods from a die.



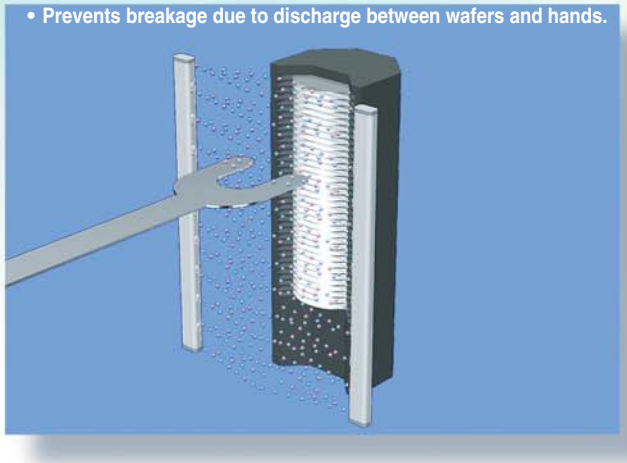
Eliminating static electricity on film molded goods

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



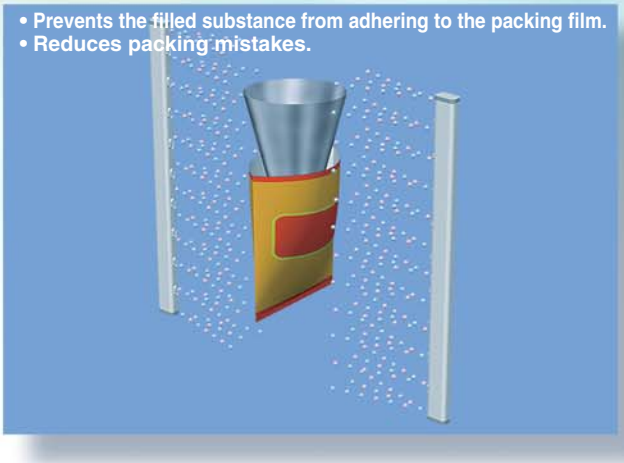
Eliminating static electricity during wafer transfer

- Prevents breakage due to discharge between wafers and hands.



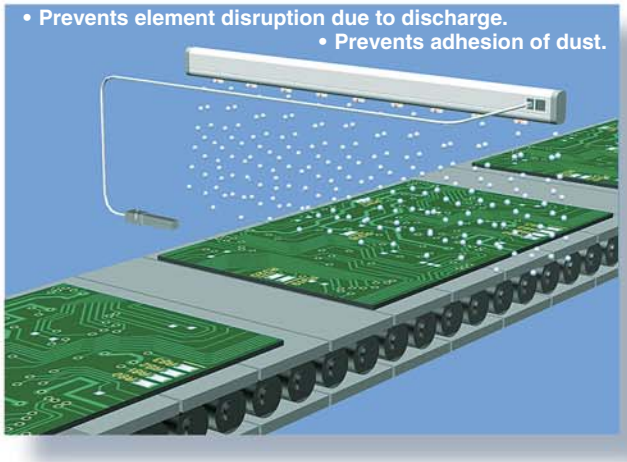
Eliminating static electricity from packing films

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



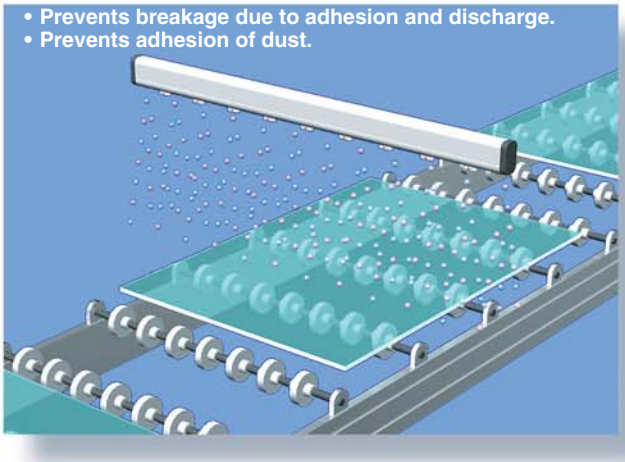
Eliminating static electricity on an electric substrate

- 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

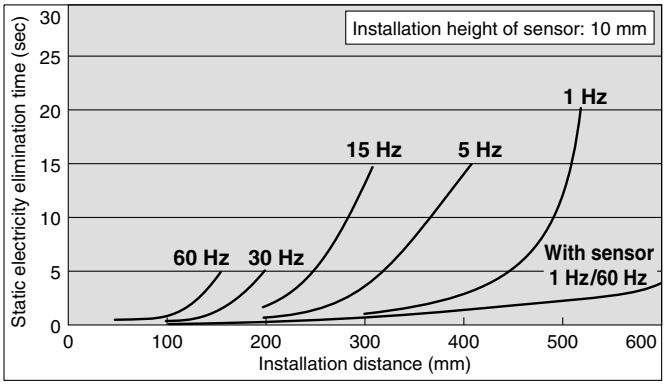
Static Electricity Elimination Characteristics

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.

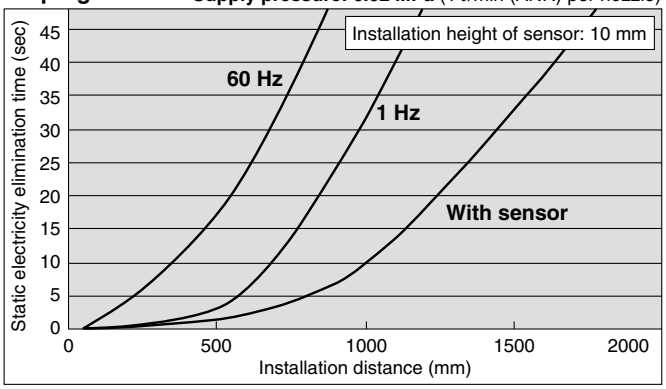
1) Installation distance and static electricity elimination time (Static electricity elimination time from 1000 V to 100 V)

Electrode cartridge with rapid elimination of static electricity

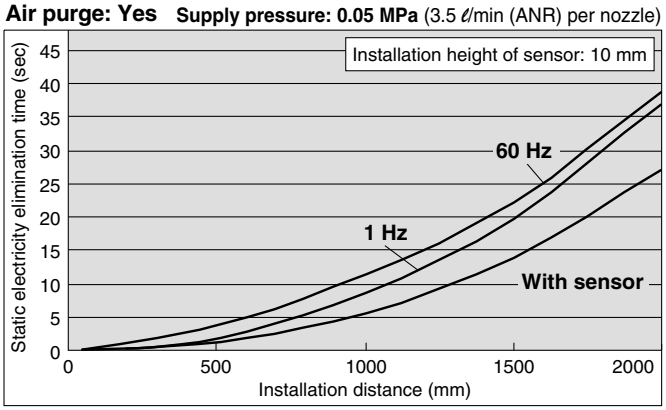
Air purge: No



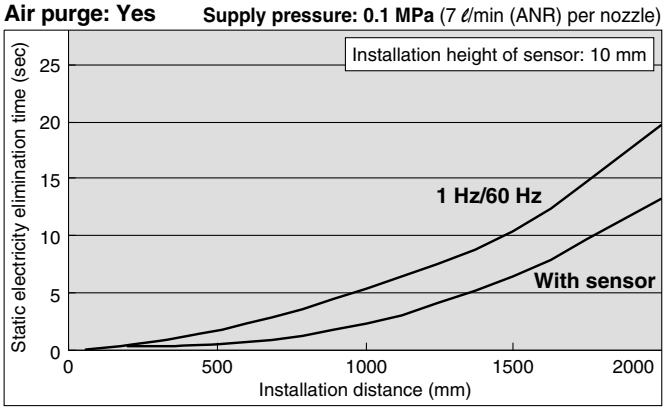
Air purge: Yes **Supply pressure: 0.02 MPa** (1 ℓ/min (ANR) per nozzle)



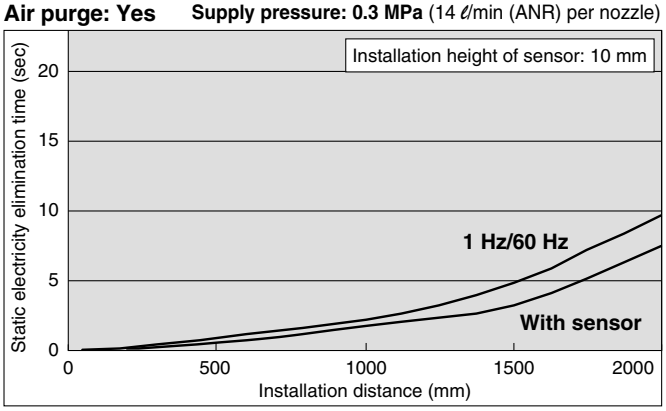
Air purge: Yes **Supply pressure: 0.05 MPa** (3.5 ℓ/min (ANR) per nozzle)



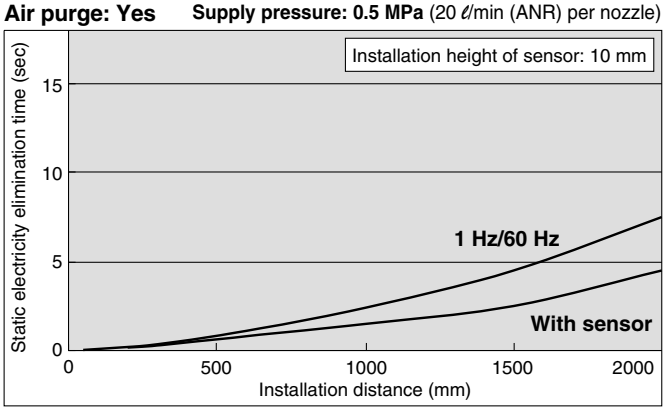
Air purge: Yes **Supply pressure: 0.1 MPa** (7 ℓ/min (ANR) per nozzle)



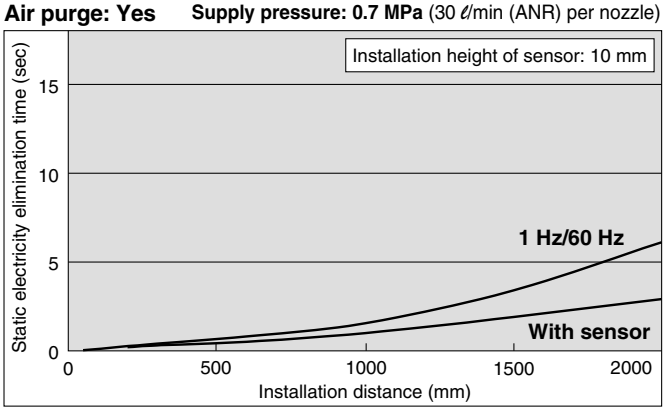
Air purge: Yes **Supply pressure: 0.3 MPa** (14 ℓ/min (ANR) per nozzle)



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)

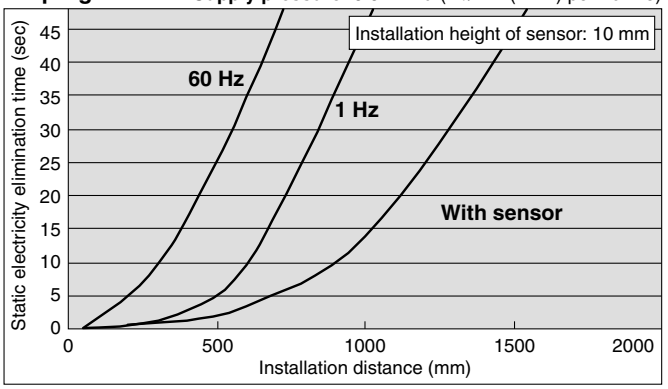


Electrode cartridge with low maintenance

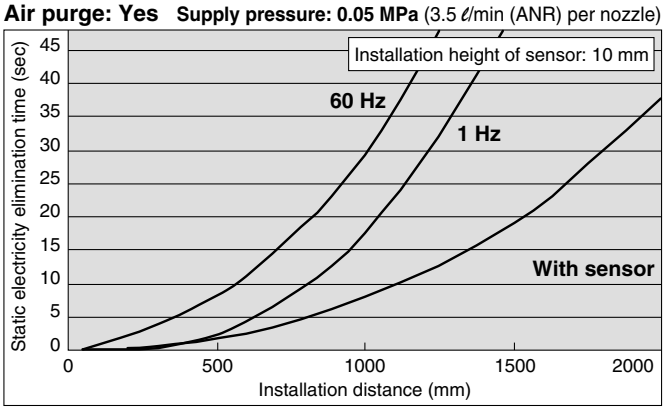
⚠Caution

Be sure to perform air purge when using a low-maintenance electrode cartridge.
Without air purge, low-maintenance efficiency will decrease.

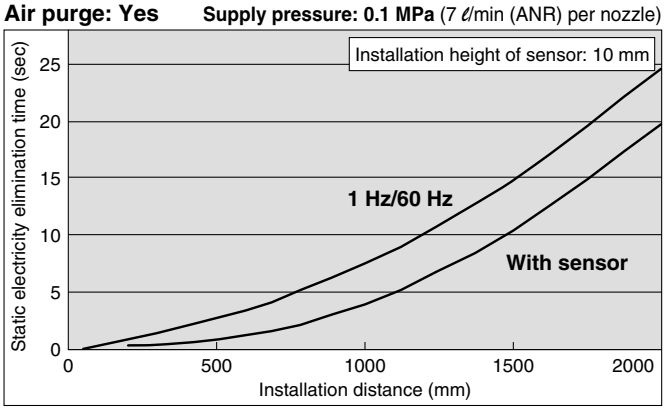
Air purge: Yes **Supply pressure: 0.02 MPa** (1 ℓ/min (ANR) per nozzle)



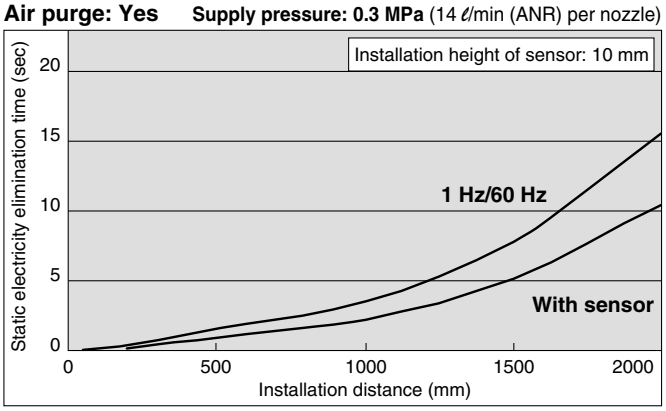
Air purge: Yes **Supply pressure: 0.05 MPa** (3.5 ℓ/min (ANR) per nozzle)



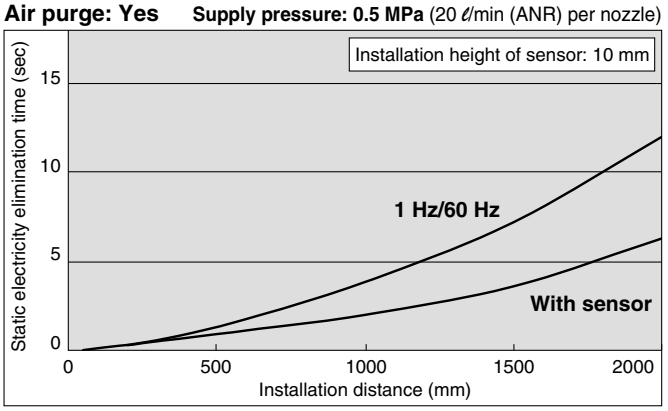
Air purge: Yes **Supply pressure: 0.1 MPa** (7 ℓ/min (ANR) per nozzle)



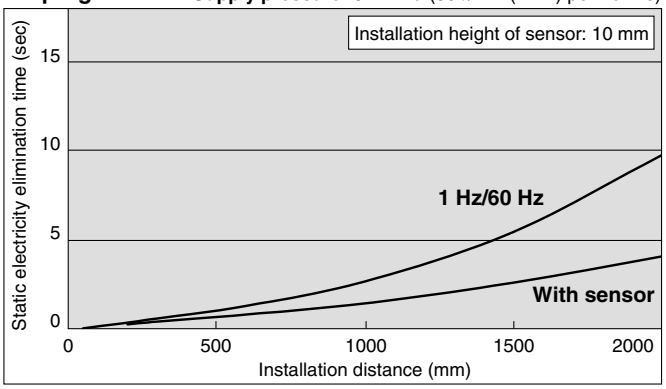
Air purge: Yes **Supply pressure: 0.3 MPa** (14 ℓ/min (ANR) per nozzle)



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)



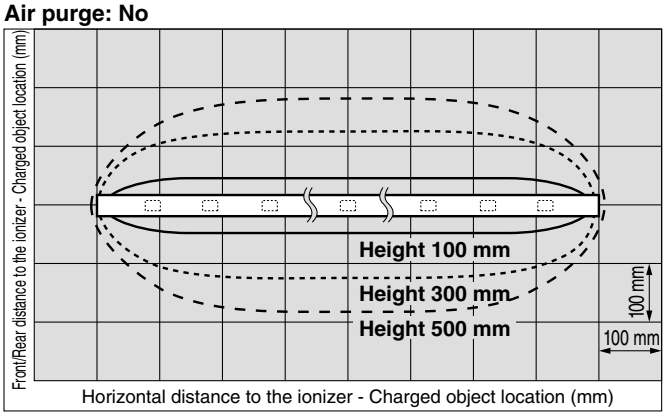
Static Electricity Elimination Characteristics

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) Static electricity elimination range

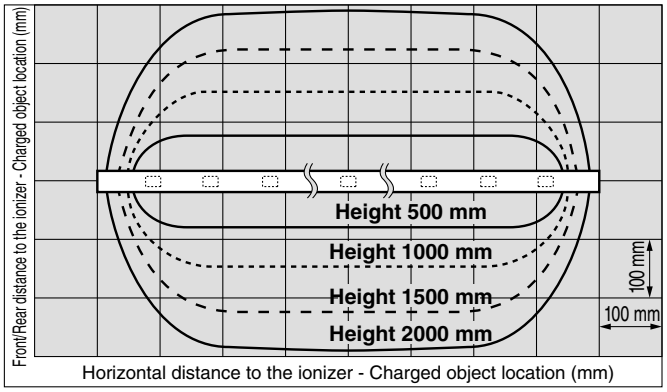
Electrode cartridge with rapid elimination of static electricity

Air purge: No



Electrode cartridge with rapid elimination of static electricity, electrode cartridge with low maintenance

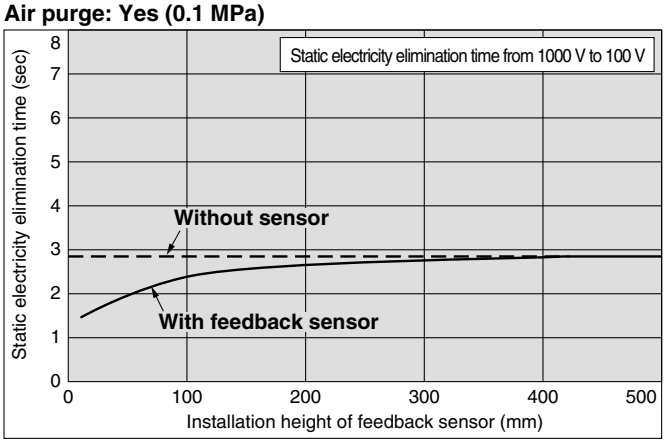
Air purge: Yes (0.05 MPa to 0.7 MPa)

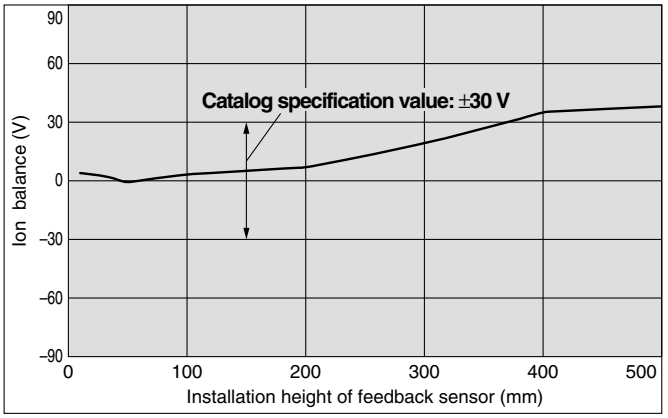


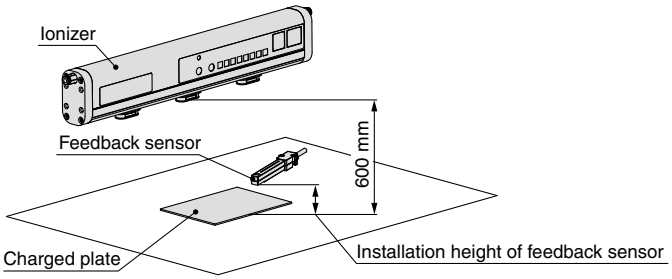
3) Installation height of feedback sensor and static electricity elimination time / Ion balance

The height of a feedback sensor should be 50 mm or less. When using a feedback sensor at higher than 50 mm, refer to the graphs below.

Air purge: Yes (0.1 MPa)





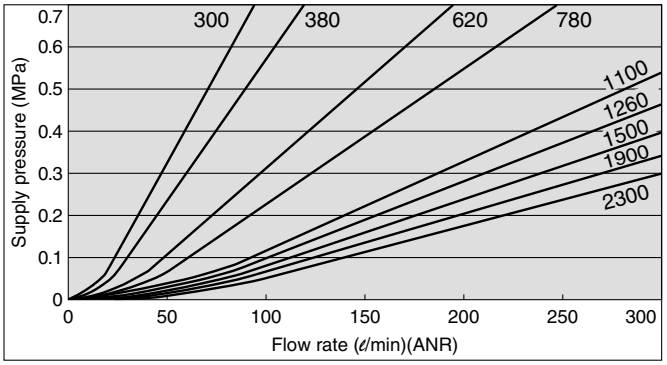


Technical Data 3

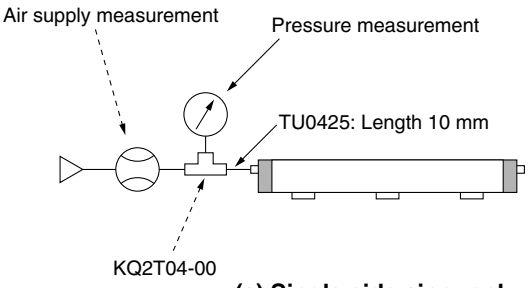
Static Electricity Elimination Characteristics

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.

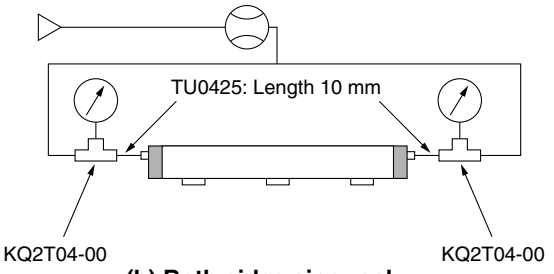
4) Flow rate — Pressure characteristics



How to measure



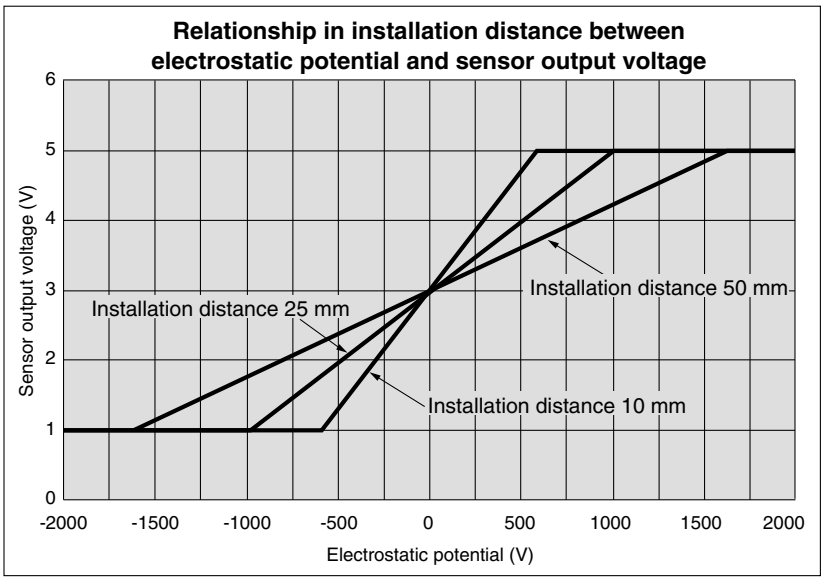
(a) Single side air supply (IZS31-300, 380, 620, 780)



(b) Both sides air supply (IZS31-1100, 1260, 1500, 1900, 2300)

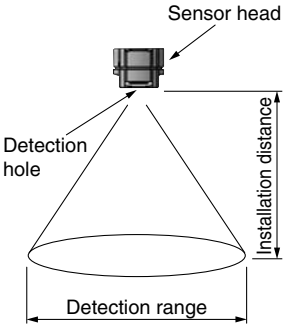
Sensor Monitor Output (When feedback sensor is used)

Note) The installation distance in the figure refers to the distance from the target to the electrostatic sensor.

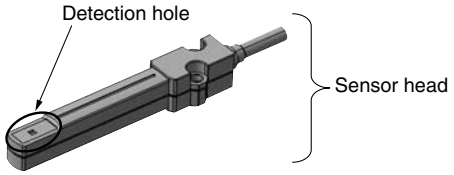


Feedback sensor detection range

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



Installation distance (mm)	Detection range (mm)
10	45
25	100
50	180



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 cartridge type / Electrode needle material

Symbol	Electrode cartridge type	Electrode needle material
Nil	Rapid elimination of static electricity	Tungsten
C		Silicon
S		Stainless steel
J	Low maintenance	Tungsten
K		Silicon

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	Without power supply cable

Made to Order
Refer to the below table.

Sensor

Nil	Without sensor
E	Autobalance sensor [Body-mounting type]*
F	With feedback sensor
G	Autobalance sensor [High-precision type]

* Connection cable A/B, with sensor bracket, but not assembled.

Bracket
(End bracket, Center bracket)

Nil	Without bracket
B	With bracket Note)

Note) The number of center brackets differ depending on the bar length. (Refer to the below table.) Not assembled.

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 page 27 through to 30 for details.)

Ionizer / Series IZS31

Symbol	Contents	Specifications
X10	Non-standard bar length (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: 80 mm-pitch) Note) Maximum bar length is 1260 mm. The air purge nozzles are arranged at an 80 mm-pitch.
X210	High-voltage/control unit detachable short type	A short type ionizer (full length of 180 mm and 220 mm) can be installed in a small space. The high-voltage unit (ionizing unit) and control unit are detachable from each other. The distance between them is also optional according to the length of selected connection cables.
X211	High-voltage/control unit detachable short type Model with 40 mm-pitch electrode cartridges	

Non-standard power supply cable length

How to Order

IZS31 – CP □ – X13

Power supply cable full length

Symbol	Cable full length
01	1 m
02	2 m
19	19 m
20	20 m

Note 1) 11 m or longer power supply cables are not CE Marking-compliant.
Note 2) Use standard power supply cables for 3 m and 10 m lengths.

Ionizer driving AC adapter (100 to 240 VAC)

How to Order

IZS31 – F □ – X196

● Power can be directly supplied from an AC source. The ionizer is driven by connection into 100 to 240 VAC.

Applicable output specifications

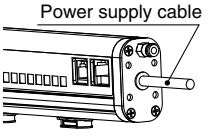
Nil	NPN specification
P	PNP specification

Individual Special Order

(Please 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 body.
Note) The power cable is connected directly to the body. A connector is not used.



Accessories

Feedback sensor
IZS31-DF

Autobalance sensor
[High-precision type]
IZS31-DG

Autobalance sensor
[Body-mounting type]
IZS31-DE

- Connection cable A/B (1 pc. each)
- Sensor bracket (1 pc.)
- Hexagon socket head cap screw for sensor bracket (2 pcs.)

} Accessories

Power supply cable
- **IZS31-CP (3 m)**
- **IZS31-CPZ (10 m)**

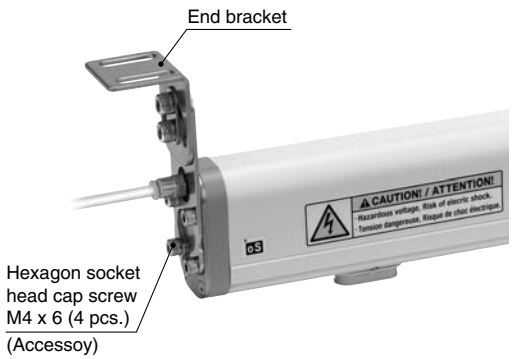
Connection cable A/B for connecting autobalance sensor to the body
- **For driving:**
  IZS31-CF (12P)

- **For I/O signals:**
  IZS31-CR (6P)

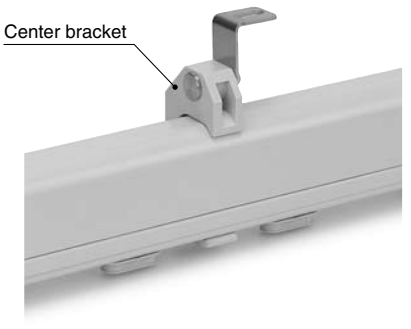
Electrode cartridge with rapid elimination of static electricity
- **IZS31-NT**
  (Material: Tungsten)
- **IZS31-NC**
  (Material: Silicon)
- **IZS31-NS**
  (Material: Stainless steel)

Electrode cartridge with low maintenance
- **IZS31-NJ**
  (Material: Tungsten)
- **IZS31-NK**
  (Material: Silicon)

End bracket / IZS31-BE



Center bracket / IZS31-BM



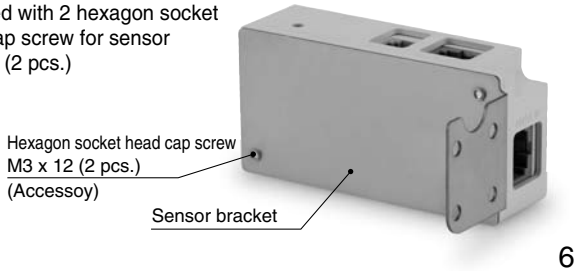
Note) The number of center brackets required, as listed below, depends on the bar length. Two end brackets are always required regardless of the bar length.

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.

Note) The model number is for a single bracket.

Sensor bracket / IZS31-BL
(For mounting IZS31-DE on the body)

∗ Provided with 2 hexagon socket head cap screw for sensor bracket (2 pcs.)



Options

Electrode cartridge security cover

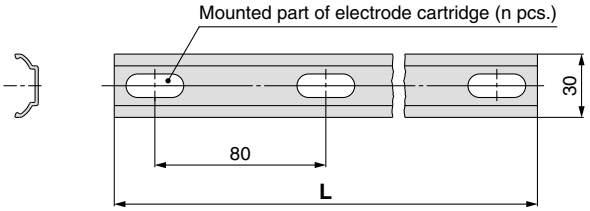
IZS31−E3

Number of fixed electrode cartridges

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

Number of required security covers

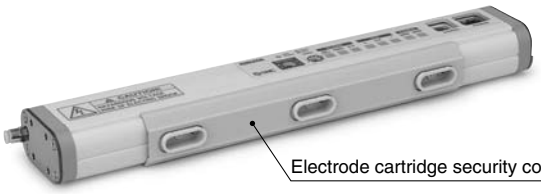
Bar length (mm)	Number of required security covers		
	IZS31-E3	**IZS31-E4**	**IZS31-E5**
300	1	—	—
380	—	1	—
620	1	1	—
780	—	1	1
1100	3	1	—
1260	1	3	—
1500	—	2	2
1900	1	5	—
2300	—	2	4



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

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

IZS31 Standard part no. − X14



When attached to the body

Screwdriver 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	
Electricity discharge output		±7000 V	
Ion balance Note 1)		±30 V (Stainless steel electrode needle: ±100 V)	
Air purge	**Fluid**	Air (Clean and dry)	
	Operating pressure	0.7 MPa or less Note 2)	
	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	Autobalance sensor [Body-mounting type]: 300 mA or less Autobalance sensor [High-precision type] : 200 mA or less When sensor is not used : 170 mA or less	
	DC mode	170 mA or less	
Input signal	**Discharge stop signal**	Connected to GND (Voltage: 5 VDC or less, Current consumption: 5 mA or less)	Connected to +24 V (Voltage: Between 19 VDC and power supply voltage, Current consumption: 5 mA or less)
	Maintenance signal		
Output signal	**Static electricity removal completion signal**	Max. load current: 100 mA Residual voltage: 1 V or less (Load current at 100 mA) Max. applied voltage: 28 VDC	Max. load current: 100 mA Residual voltage: 1 V or less (Load current at 100 mA)
	Maintenance output signal		
	Error signal		
	Sensor monitor output Note 3)	Voltage output 1 to 5 V (Connect a 10 kΩ or larger load.)	
Effective distance of static electricity elimination		50 to 2000 mm (Sensing DC mode: 200 to 2000 mm)	
Ambient temperature, Fluid temperature		0 to 50°C	
Ambient humidity		35 to 80% Rh (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: 2004/108/EC, Low voltage directive: 73/23/EEC, 93/68/EEC) UL U.S. Standard for Electrostatic Air Cleaner, UL867, fourth edition CSA Canadian Standard for Electrostatic Air Cleaner, CAN/CSA C22.2 No.187-M1986	

Note 1) When the air purge is performed between a charged object and an ionizer at a distance of 300 mm
Note 2) When the electrode cartridge with low maintenance is used, the operating pressure must be 0.05 MPa or more.
Note 3) When the potential of a charged object is measured by a feedback sensor, the relationship between the potential being measured and the sensor monitor output voltage, and the detection range of the sensor vary depending on the sensor's installation distance. Refer to page 4.

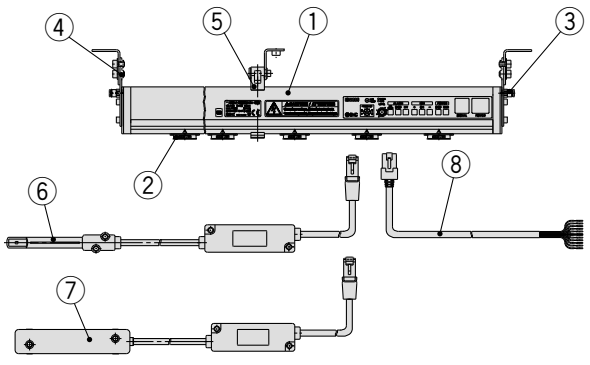
Number of Electrode Cartridges/Weight

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
Weight (g)	470	530	720	850	1100	1220	1410	1730	2040

Sensor

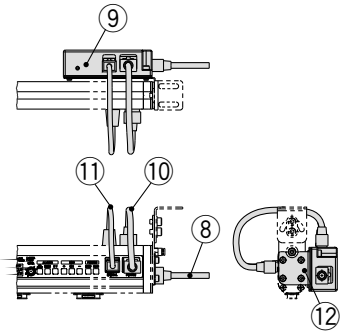
Sensor model	**IZS31-DF** (Feedback sensor)	**IZS31-DG** (Autobalance sensor [High-precision type])	**IZS31-DE** (Autobalance sensor [Body-mounting type])
Ambient temperature	0 to 50°C		
Ambient humidity	35 to 85% Rh (No condensation)		
Case material	ABS	ABS, Stainless steel	ABS
Vibration resistance	Durability 50 Hz Amplitude 1 mm XYZ each 2 hours		
Shock resistance	10 G		
Weight	200 g (Including cable weight)	220 g (Including cable weight)	110 g (Including cable weight)
Installation distance	10 to 50 mm (Recommended)	—	
Compliance with overseas standards/directive	CE (EMC directive: 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 [High-precision type]**
8	**Power supply cable**
9	**Autobalance sensor [Body-mounting type]**
10	**Connection cable A (12P)**
11	**Connection cable B (6P)**
12	**Sensor bracket**

IZS31-DE
When mounting on the body



Functions

1. Run mode

There are 3 different run 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 static electricity elimination 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 elimination to emit. The static electricity elimination completion signal turns off when the workpiece's electrostatic potential falls within ±30 V. Note)

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

Either "Energy Saving Run" or "Continuous Static Electricity Elimination Run" can be selected depending on the ionizer's operation after static electricity elimination is completed.

Energy saving run	The ionizer stops discharging automatically after the of static electricity elimination is completed. It resumes discharging when the workpiece's electrostatic potential exceeds ±30 V. Note) For static electricity elimination from conductive workpieces, "Energy Saving Run" is recommended.
Continuous static electricity elimination run	Even after the completion of static electricity elimination, this method continues to eliminate static electricity using DC pulses while controlling the ion balance, so that the workpiece's electrostatic potential falls within 30 V. Note) For static electricity elimination from nonconductive workpieces, "Continuous Static Electricity Elimination 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 (high-precision type) is used.

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. The ion balance is adjusted and retained at the position of the workpiece.

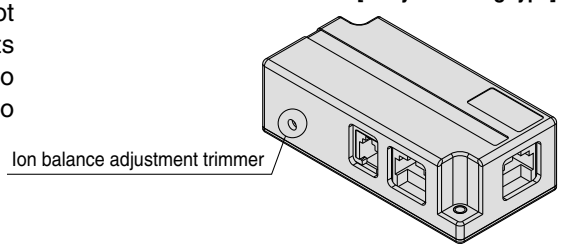
Either "Manual Run" or "Automatic Run" can be selected depending on the method of ion balance adjustment.

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

● When an autobalance sensor (body-mounting type) is used.

Controls to keep the initial ion balance. If the ion balance cannot be kept due to electrode needle contamination, the ionizer outputs a maintenance output signal. Use a balance adjustment trimmer to set the ion balance (requires a separate measuring instrument to verify the ion balance).

Autobalance sensor [Body-mounting type]



● When a 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.

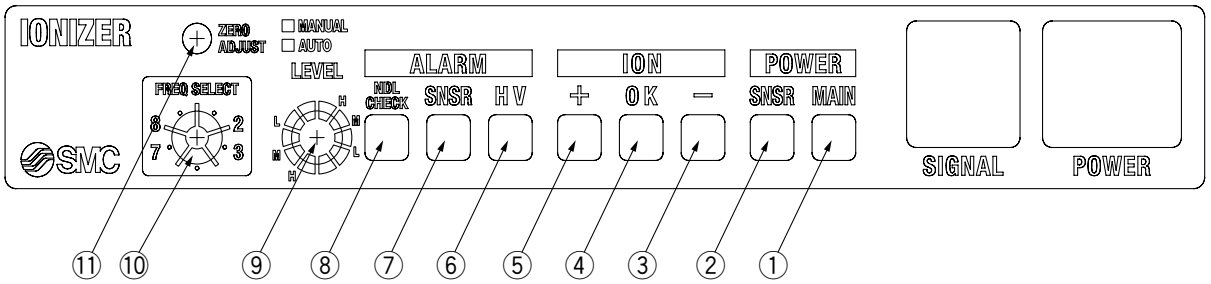
Functions

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 eliminate static electricity. If the needles need to be cleaned due to such deterioration, the maintenance indicator LED comes on and a maintenance output signal turns ON. Ion emission continues even if the maintenance output signal is turned ON.

Note) Deterioration in static electricity elimination capability cannot be detected by only connecting a feedback sensor, autobalance sensor [high-precision type], or autobalance sensor [body-mounting type]. Verify the capability by periodically inputting a maintenance start signal.

3. Indicator description



No.	Description	Type	Contents
1	**Power supply indicator**	LED (Dark green)	Illuminates when power is supplied. Flashes when the supply voltage is irregular.
2	**Sensor indicator**	LED (Dark green)	Illuminates when the feedback sensor, autobalance sensor [high-precision type], or autobalance sensor [body-mounting type] is connected.
3	**Negative indicator**	LED (Blue)	Functionality differs depending on the run mode. Refer to "Model Selection and Settings" on page 13, 17, 20.
4	**Completion indicator**	LED (Dark green)	
5	**Positive indicator**	LED (Orange)	
6	**Irregular high-voltage indicator**	LED (Red)	Illuminates when an irregular current flows through an electrode needle.
7	**Irregular sensor indicator**	LED (Red)	Illuminates when the feedback sensor, autobalance sensor [high-precision type], or autobalance sensor [body-mounting type] is not operating normally.
8	**Maintenance indicator**	LED (Red)	Illuminates when the electrode needle contamination is detected. Flashes while the contamination is being detected.
9	**Maintenance level selection switch**	Rotary switch	Functionality differs depending on the run mode. Refer to "Model Selection and Settings" on page 11, 15, 16, 19.
10	**Frequency selection switch**	Rotary switch	
11	**Balance adjustment trimmer**	Trimmer	Used to adjust the ion balance when the autobalance sensor [high-precision type] or autobalance sensor [body-mounting type] is not used.

Model Selection and Settings 1 / Sensing DC Mode

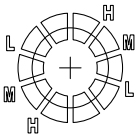
1. Sensing DC mode (Refer to page 15 when using the ionizer in the pulse DC mode, or refer to page 19 when using it in the DC mode.)

1) Bar length selection
- Select the appropriate length suited for a work size by referring to “Static Electricity Elimination Characteristics” and “Static Electricity Elimination Range”, etc.

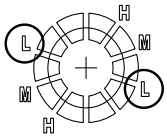
2) Ionizer installation
- Install the ionizer within 200 to 2000 mm. Although the ionizer can also be used at other distances, it may fail to operate normally depending on the conditions of use. Before use, always verify that the ionizer is functioning normally.

3) Sensor installation
- 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 static electricity elimination time/Ion balance” on page 3 as a guide.)
- When the ionizer and feedback sensor are connected, the sensing DC mode is automatically selected.

4) Stain-detection level setting on an electrode needle
- Maintenance level selection switch
- Set the switch to either H (High), M (Middle), L (Low). At settings other than these, the ionizer does not perform the electrode needle stain-detection.



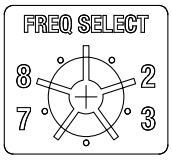
H (High)····· Level that does not affect the static electricity elimination time.
M (Middle)···· Level at which the static electricity elimination time is a little bit longer than it was initially.
L (Low)····· Level that gives the alarm before static electricity elimination cannot be performed.

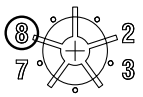
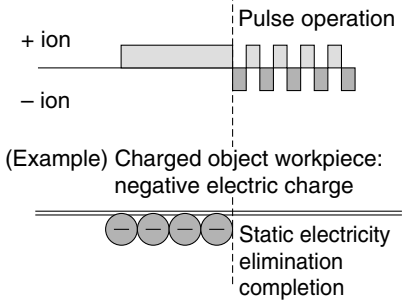
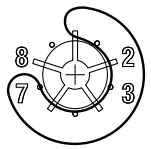


* Settings with the same letter share the same level.

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

5) Frequency selection switch setting
- Select “Energy Saving Run” or “Continuous Static Electricity Elimination Run”.
- In case of “Continuous Static Electricity Elimination Run”, select the ion generation frequency after static electricity elimination is completed.

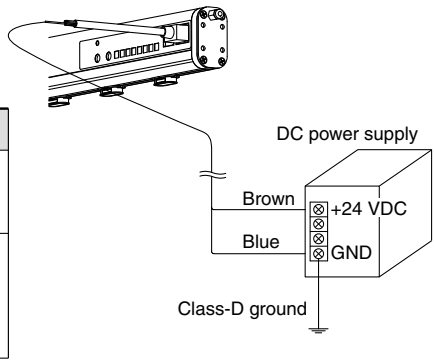


Details of operation			Switch setting
Energy saving run	Automatically stops emitting electricity even after static electricity elimination is completed.		
Continuous static electricity elimination run	Continously eliminates static electricity with pulse DC by controlling the ion balance so that the charged potential on a workpiece would be within ±30V even after static electricity elimination is completed. 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

Model Selection 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
DC1(–)	Blue	Power supply GND [FG]	○	
OUT4	Dark 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.

■ **Connection with input/output signal power supply**

Symbol	Cable color	Description	Connection needs	Contents
DC2(+)	Red	Power supply 24 VDC	○	Input/Output signal power cable
DC2(–)	Black	Power supply GND	○	
IN1	Light green	Discharge stop signal	○	Signal for ionizer run/stop (NPN spec.) Turned to the run mode when connected to DC2 (–). [Black] (PNP spec.) Turned to the run mode when connected to DC2 (+). [Red]
IN2	Gray	Maintenance start signal	△	Input signal when determining the necessity of electrode needle maintenance
–	White	–	–	–
–	Orange	–	–	–
OUT1	Pink	Static electricity elimination completion signal	△	Turned ON when the workpiece's electrostatic potential is within ±30 V or when the electrode needle contamination is being detected.
OUT2	Yellow	Maintenance output signal	△	Turned ON when the electrode needle maintenance is necessary.
OUT3	Purple	Irregular signal	△	Turned ON in normal operation. Turned OFF in case of high-voltage error, sensor error, CPU error.

○: 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.

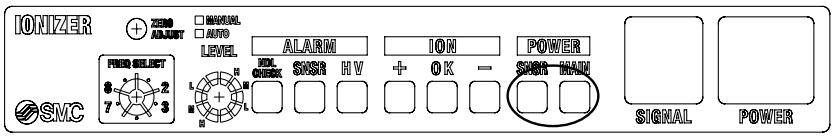
7) Air piping

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

Model Selection and Settings 1 / Sensing DC Mode

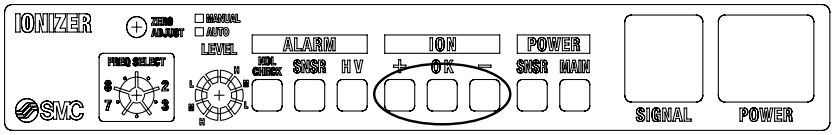
8) LED indicators

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



LED		Function
POWER	MAIN	Illuminates when power is supplied. (Dark green) (Flashes when the power supply is irregular.)
	SNSR	Illuminates when the feedback sensor is connected. (Dark green)

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

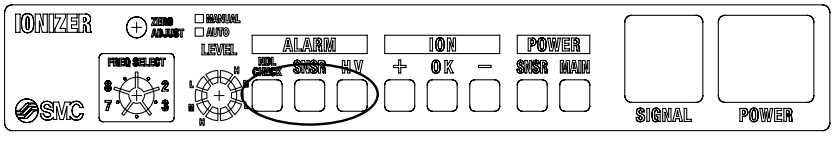


LED		Function
ION	+	Illuminates when the workpiece is positively charged. (Orange)
	OK	Illuminates when the workpiece electrostatic potential is low. (Dark green)
	–	Illuminates when the workpiece is negatively charged. (Blue)

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

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

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



LED		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 the electrode needle contamination is detected. (Red) (Flashes while the contamination is being detected.)

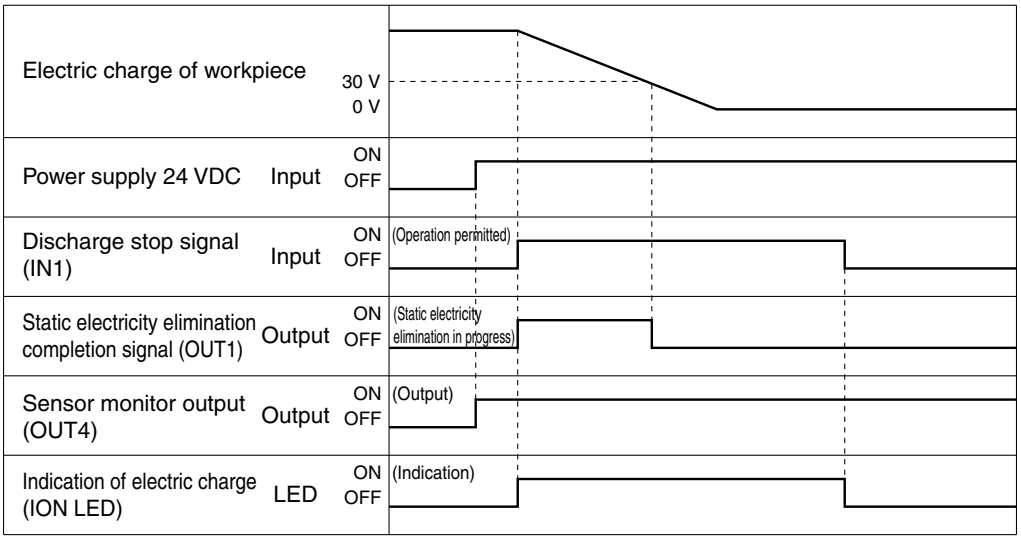
Model Selection and Settings 1 / Sensing DC Mode

9) Alarm

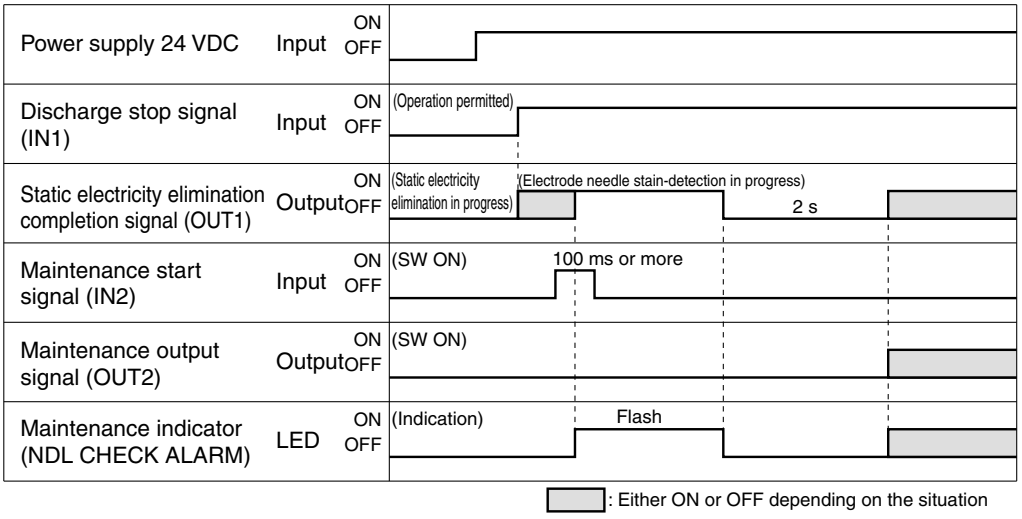
Alarm item	Description	Corrective actions
High-voltage error	Gives notification of the occurrence of an abnormal current, such as high-voltage leakage. The ionizer stops ion emission, turns on the HV ALARM indicator, and turns OFF the error signal (OUT3).	Turn OFF the power supply, solve the problem, then turn the power supply on again. Alternatively, turn the discharge stop signal (IN1) OFF, then ON.
Sensor error	Gives notification that the feedback sensor has become unable to operate normally. The ionizer stops ion emission, turns on the SNSR ALARM indicator, and turns OFF the error signal (OUT3).	Turn OFF the power supply, solve the problem, then turn the power supply on again. Alternatively, turn the discharge stop signal (IN1) OFF, then ON.
CPU error	Gives notification of the occurrence of a failure in the CPU due to noise, etc. The ionizer stops ion emission, all of the LED indicators flash, and turns OFF the error signal (OUT3).	Turn OFF the power supply, solve the problem, then turn the power supply on again. Alternatively, turn the discharge stop signal (IN1) OFF, then ON.
Electrode needle maintenance	Gives notification that the electrode needle maintenance is necessary. The NDL CHECK ALARM indicator comes on and a maintenance output signal (OUT2) turns ON.	Turn OFF the power supply, clean or replace the electrode needles, and turn the power supply on again.

10) Timing chart

■ Timing chart in normal operation



■ Timing chart when the electrode needle contamination is detected.



· Static electricity elimination completion signal is turn on when the electrode needle stain-detection 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.

Model Selection and Settings 2 / Pulse DC Mode

2. Pulse DC mode

1) Bar length selection

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

2) Ionizer installation

· Install the ionizer within 50 to 2000 mm of the object requiring electricity elimination. However, install the ionizer at a distance from 100 to 2000 mm when using an autobalance sensor [high-precision type].
Although the ionizer 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 ionizer is functioning normally.

3) Sensor installation

Autobalance sensor [High-precision type]

· When adjusting the ion balance using a high-precision type sensor, install the sensor immediately blow the ionizer so that it is close to the workpiece.

· When an autobalance sensor is connected, settings of the balance adjustment trimmer on the body are nullified.

Autobalance sensor [Body-mounting type]

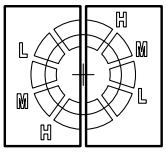
· When adjusting the ion balance using a body-mounting type sensor, fix it to the ionizer with a bracket and then use the connection cables A and B to connect the ionizer and sensor.

· When an autobalance sensor is connected, settings of the balance adjustment trimmer on the body are nullified.

4) Maintenance level selection switch setting

Autobalance sensor [High-precision type]

· Select “Manual Run” or “Automatic Run” when an autobalance sensor [high-precision type] is connected to adjust the ion balance.



AUTO MANUAL

Details of operation		Switch setting
Manual run	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 run	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.

Autobalance sensor [Body-mounting type]

Configuration is not necessary.

5) Ion balance adjustment

Autobalance sensor [High-precision type]

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

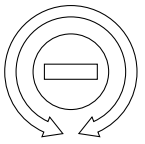
Either “Manual Run” or “Automatic Run” can be selected depending on the method of ion balance adjustment.

Manual run	When a maintenance start signal is input or the ionizer is turned on, this method adjusts the ion balance. For static electricity elimination from moving workpieces, “Manual Run” is recommended. Start system operation after ion balance adjustment is completed.
Automatic run	This method continuously adjusts the ion balance. For static electricity elimination from stationary workpieces or prescribed spatial static electricity elimination, “Automatic Run” is recommended.

Autobalance sensor [Body-mounting type]

Control to keep the initial ion balance.

When changing the ion balance settings, use a balance adjustment trimmer on the autobalance sensor (requires a separate measuring instrument to verify the ion balance).



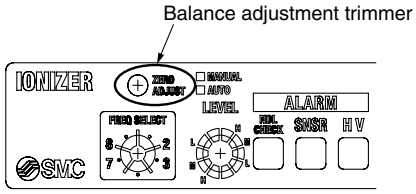
→Right: + offset
←Left: – offset

A balance adjustment trimmer is turned two full turns.

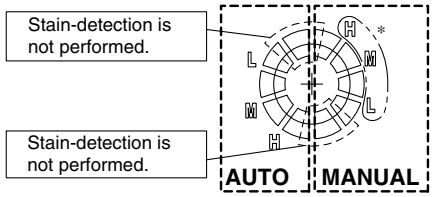
Model Selection and Settings 2 / Pulse DC Mode

■ When a 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 on the body.



· Configuration of stain-detection level on an electrode needle.
· Set the switch to either H (High), M (Middle), L (Low). At settings other than these, the ionizer does not perform the electrode needle stain-detection.



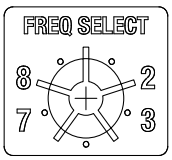
H (High)·····Level that does not affect the static electricity elimination time.
M (Middle)·····Level at which the static electricity elimination time is a little bit longer than it was initially.
L (Low)·····Level that gives the alarm before static electricity elimination cannot be performed.

* When an autobalance sensor is used, select the switch based on the operation mode.
Example: When adjusting the ion balance in the manual run using an autobalance sensor, select a maintenance level of H, M, L on the MANUAL side.

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

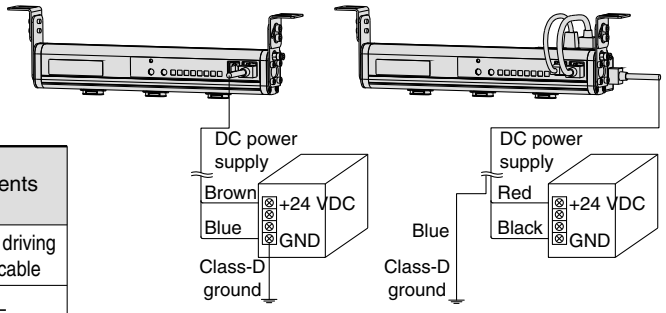
6) Frequency selection switch setting

· Select the 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

⚠Caution



Apply Class-D ground after connecting the DC1(–) lead (Blue) of the power supply cable to the power supply GND.

Autobalance sensor [High-precision type]

Apply Class-D ground without connecting the DC1(–) lead (Blue) of the power supply cable to the power supply GND.

Autobalance sensor [Body-mounting type]

7) Wiring of power supply cable

· Connect the dedicated power supply cable.

■Connection with ionizer driving power supply

Symbol	Cable color	Description	Connection needs		Contents
			High-precision type	Body-mounting type	
DC1(+)	Brown	Power supply 24 VDC	○	—	Ionizer driving power cable
DC1(–)	Blue	Power supply GND [FG]*	○	○ [FG]	
OUT4	Dark green	Sensor monitor output	—	—	—

* When a high-precision type sensor is used, connect DC1 (–) [Blue] to the power supply GND and be sure to ground according to Class-D. If the lead is not grounded, the ionizer may malfunction.
* When a body-mounting type sensor is used, do not connect DC1 (–) [Blue] to the power supply GND and be sure to ground according to Class-D. In case of connecting the lead to the power supply GND and grounding according to Class-D, all I/O signals are not insulated from the FG terminal.

■Connection with input/output signal power supply

Symbol	Cable color	Description	Connection needs		Contents
			High-precision type	Body-mounting type	
DC2 (+)	Red	Power supply 24 VDC	○	○	Input/Output signal power cable
DC2 (–)	Black	Power supply GND	○	○	
IN1	Light green	Discharge stop signal	○	○	Signal for ionizer run/stop (NPN spec.) Turned to the run mode when connected to DC2 (–). [Black] (PNP spec.) Turned to the run mode when connected to DC2 (+). [Red]
IN2	Gray	Maintenance start signal	△	△	Input signal when determining the necessity of electrode needle maintenance
—	White	—	—	—	—
—	Orange	—	—	—	—
OUT1	Pink	Static electricity elimination completion signal	△	△	Outputs when the electrode needle stain-detection is in progress.
OUT2	Yellow	Maintenance output signal	△	△	Outputs when the electrode needle maintenance is necessary.
OUT3	Purple	Irregular signal	△	△	Outputs in case of high-voltage error, sensor error, CPU error. (B contact output)

○: 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.

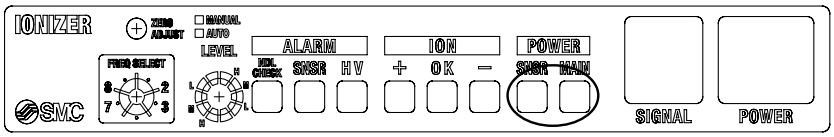
Model Selection and Settings 2 / Pulse DC Mode

8) Air piping

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

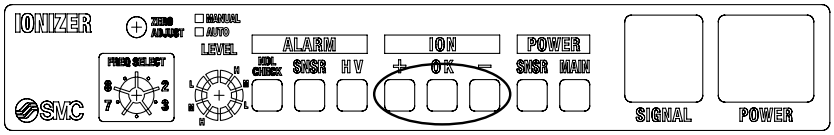
9) LED indicators

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



LED		Function
POWER	MAIN	Illuminates when power is supplied. (Dark green) (Flashes when the power supply is irregular.)
	SNSR	Illuminates when an autobalance sensor [high-precision type or body-mounting type] is connected. (Dark green)

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



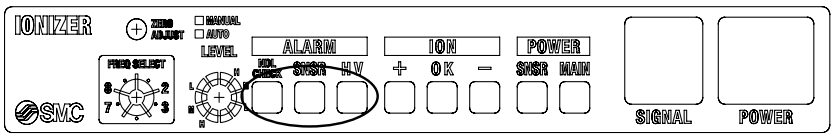
LED		Function
ION	+	Illuminates that positive ions are being emitted from the ionizer. (Orange)
	OK	When an autobalance sensor [high-precision type] is used, it indicates the state of ion balancing. (Dark green) Light OFF when a sensor is not used, or an autobalance sensor [body-mounting type] is used.
	–	Illuminates that negative ions are being emitted from the ionizer. (Blue)

· When an autobalance sensor [high-precision type] is used, the state of ion balancing can be checked by reading the LED indicator.

Ion balance	OK LED
Under ±30 V	Light ON (or Flash)
±30 V or more	Light OFF

∗ The OK LED indicator flashes when the ion balance is approaching the limits of the adjustable range, signaling that the time for electrode needle maintenance is approaching.

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



LED		Function
ALARM	HV	Illuminates when an abnormal current flows through an electrode needle. (Red)
	SNSR	Illuminates when the autobalance sensor [high-precision type] is not operating normally. (Red)
	NDL CHECK	Illuminates when the electrode needle contamination is detected. (Red) (Flashes while the contamination is being detected.)

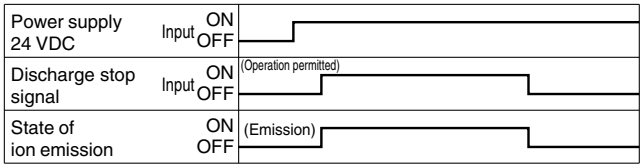
Model Selection and Settings 2 / Pulse DC Mode

10) Alarm

Alarm item	Description	Corrective actions
High-voltage error	Gives notification of the occurrence of an abnormal current, such as high-voltage leakage. The ionizer stops ion emission, turns on the HV ALARM indicator, and turns OFF the error signal (OUT3).	Turn OFF the power supply, solve the problem, then turn the power supply on again. Alternatively, turn the discharge stop signal (IN1) OFF, then ON.
Sensor error	Gives notification that the autobalance sensor (high-precision type or body-mounting type) has become unable to operate normally. The ionizer stops ion emission, turns on the SNSR ALARM indicator, and turns OFF the error signal (OUT3).	Turn OFF the power supply, solve the problem, then turn the power supply on again. Alternatively, turn the discharge stop signal (IN1) OFF, then ON.
CPU error	Gives notification of the occurrence of a failure in the CPU due to noise, etc. The ionizer stops ion emission, all of the LED indicators flash, and turns OFF the error signal (OUT3).	Turn OFF the power supply, solve the problem, then turn the power supply on again. Alternatively, turn the discharge stop signal (IN1) OFF, then ON.
Electrode needle maintenance	Gives notification that the electrode needle maintenance is necessary. The NDL CHECK ALARM indicator comes on and a maintenance output signal (OUT2) turns ON. ∗ Ions are continuously emitted.	Turn OFF the power supply, clean or replace the electrode needles, and turn the power supply on again. After turning power supply on, adjust the ion balance.

11) Timing chart

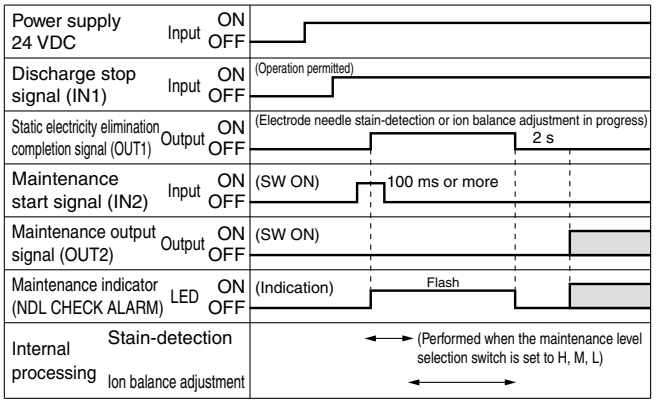
■ Timing chart in normal operation



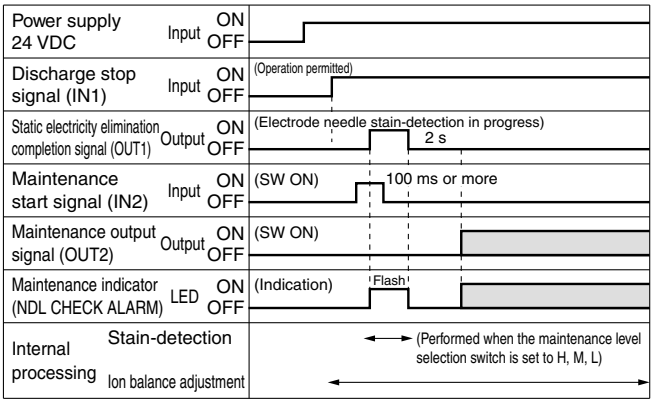
■ Timing chart when the electrode needle contamination is detected or ion balance is detected.

(a) When an autobalance sensor [high-precision type] is connected.

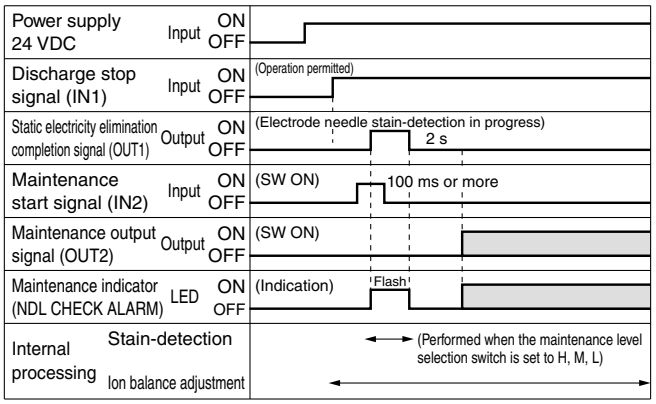
(1) Manual run



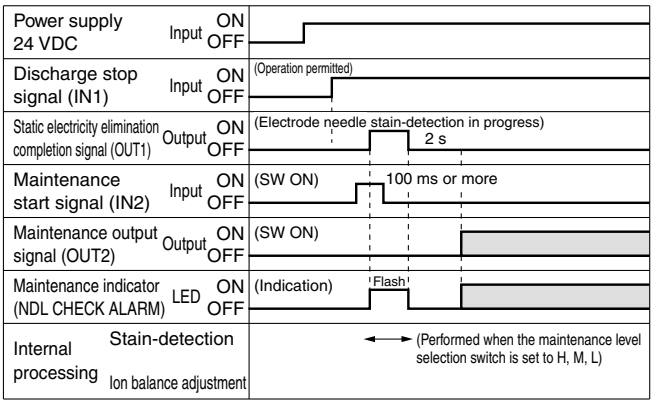
(2) Automatic run



(b)When an autobalance sensor [body-mounting type] is connected.



(c)When a sensor is not connected.



: Either ON or OFF depending on the situation

· Static electricity elimination completion is turned on when the electrode needle stain-detection 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.

Model Selection and Settings 3 / DC Mode

3. DC mode

1) Bar length selection

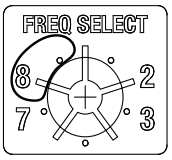
· Select the appropriate length suited for a work size by referring to “Static Electricity Elimination Characteristics” and “Static Electricity Elimination Range”, etc.

2) Ionizer installation

· Install the ionizer within 50 to 2000 mm of the object requiring electricity elimination. Although the ionizer 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 ionizer is functioning normally.

3) Frequency selection switch setting

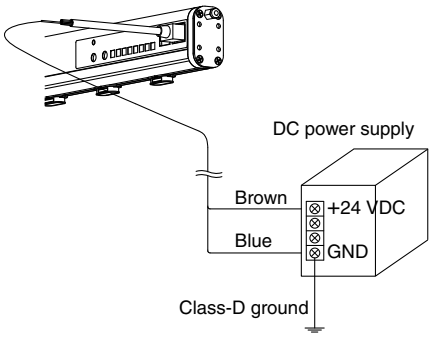
· Select “Positive Ion Emission” or “Negative Ion Emission”.



Ion polarity	Switch setting
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 cable
DC1 (–)	Blue	Power supply GND [FG]	○	
OUT4	Dark 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.

■Connection with input/output signal power supply

Symbol	Cable color	Description	Connection needs	Contents
DC2(+)	Red	Power supply 24 VDC	○	Input/Output signal power cable
DC2(–)	Black	Power supply GND	○	
IN1	Light green	Discharge stop signal	○	Signal for ionizer run/stop (NPN spec.) Turned to the run mode when connected to DC2 (–). [Black] (PNP spec.) Turned to the run mode when connected to DC2 (+). [Red]
IN2	Gray	Maintenance start signal	—	—
—	White	—	—	—
—	Orange	—	—	—
OUT1	Pink	Static electricity elimination completion signal	—	—
OUT2	Yellow	Maintenance output signal	—	—
OUT3	Purple	Irregular signal	△	Turned ON in normal operation. Turned OFF in case of high-voltage error, CPU error.

○ : 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.

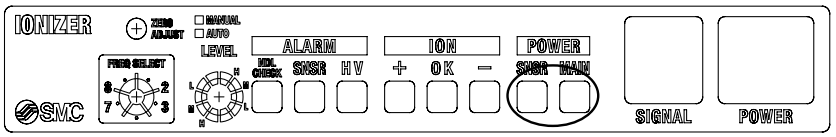
5) Air piping

· For single-side piping, block the unused port with the plug (M-5P-X112) supplied with the ionizer.

Model Selection and Settings 3 / DC Mode

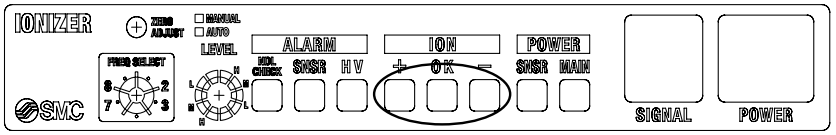
6) LED indicators

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



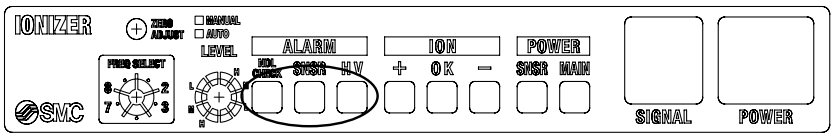
LED		Function
POWER	MAIN	Illuminates when power is supplied. (Dark green) (Flashes when the power supply is irregular.)
	SNSR	Light OFF

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



LED		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.**



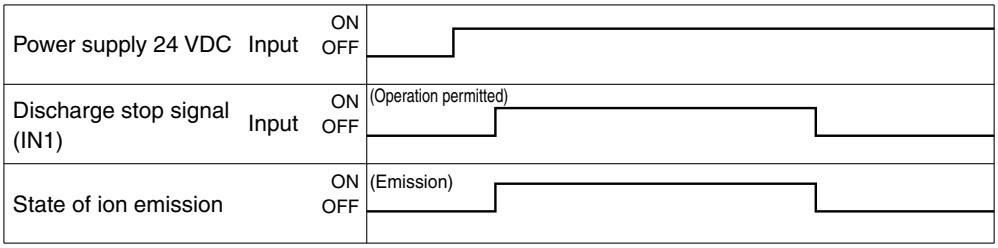
LED		Function
ALARM	HV	Illuminates when an abnormal current flows through an electrode needle. (Red)
	SNSR	Light OFF
	NDL CHECK	Light OFF

7) Alarm

Alarm item	Description	Corrective actions
High-voltage error	Gives notification of the occurrence of an abnormal current, such as high-voltage leakage. The ionizer stops ion emission, turns on the HV ALARM indicator, and turns OFF an error signal (OUT3).	Turn OFF the power supply, solve the problem, then turn the power supply on again. Alternatively, turn the discharge stop signal (IN1) OFF, then ON.
CPU error	Gives notification of the occurrence of a failure in the CPU due to noise, etc. The ionizer stops ion emission, all of the LED indicators flash, and turns OFF an error signal (OUT3).	Turn OFF the power supply, solve the problem, then turn the power supply on again. Alternatively, turn the discharge stop signal (IN1) OFF, then ON.

8) Timing chart

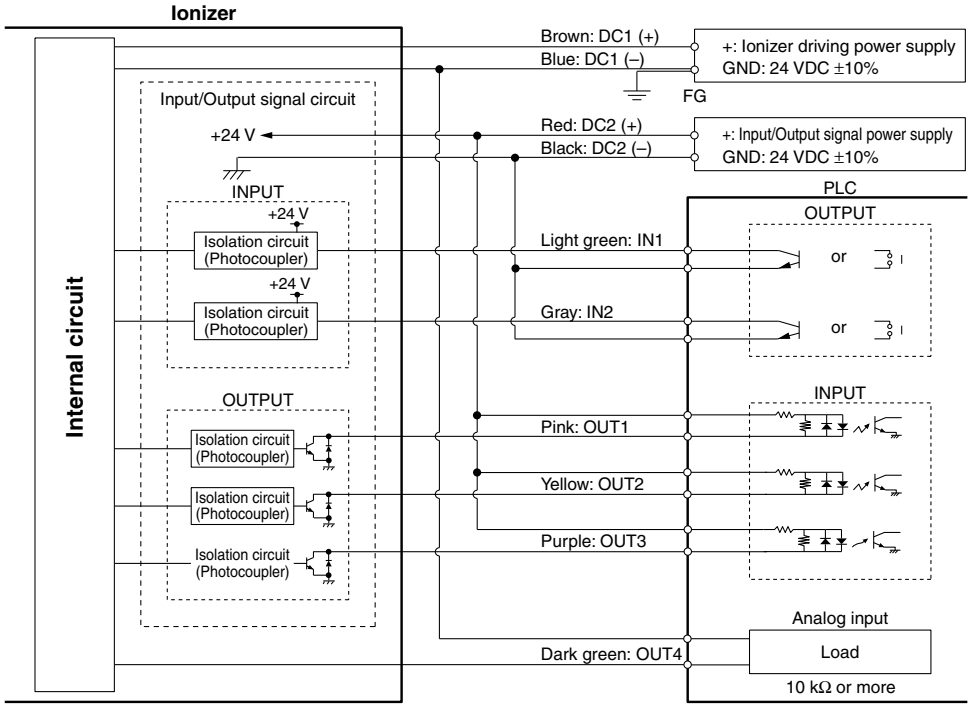
■ **Timing chart in normal operation**



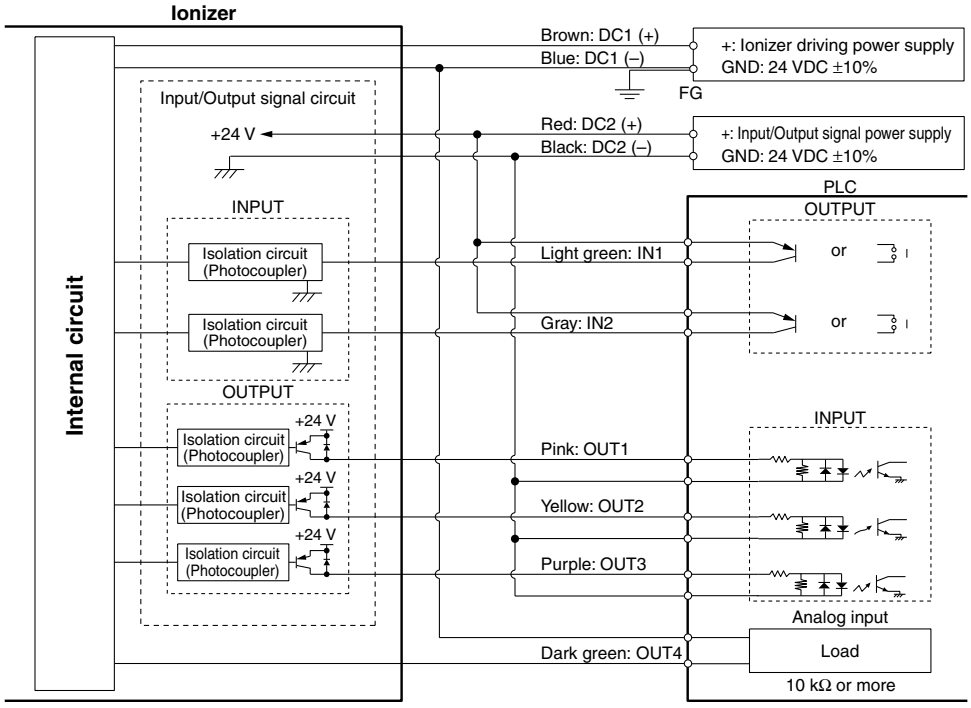
Circuit of Power Supply Cable Connection

(1) When a sensor is not used. / When a feedback sensor or autobalance sensor [high-precision type] is used.

NPN output



PNP output



Apply Class-D grounding to the GND terminal of the ionizer driving power supply by connecting through the lead DC (–) [Blue] to the FG terminal. The leads for output signals (OUT1 to OUT3) are insulated from the insulation circuit (Photocoupler) while the sensor monitor output lead* (OUT4: Dark green) is not insulated from the FG terminal.

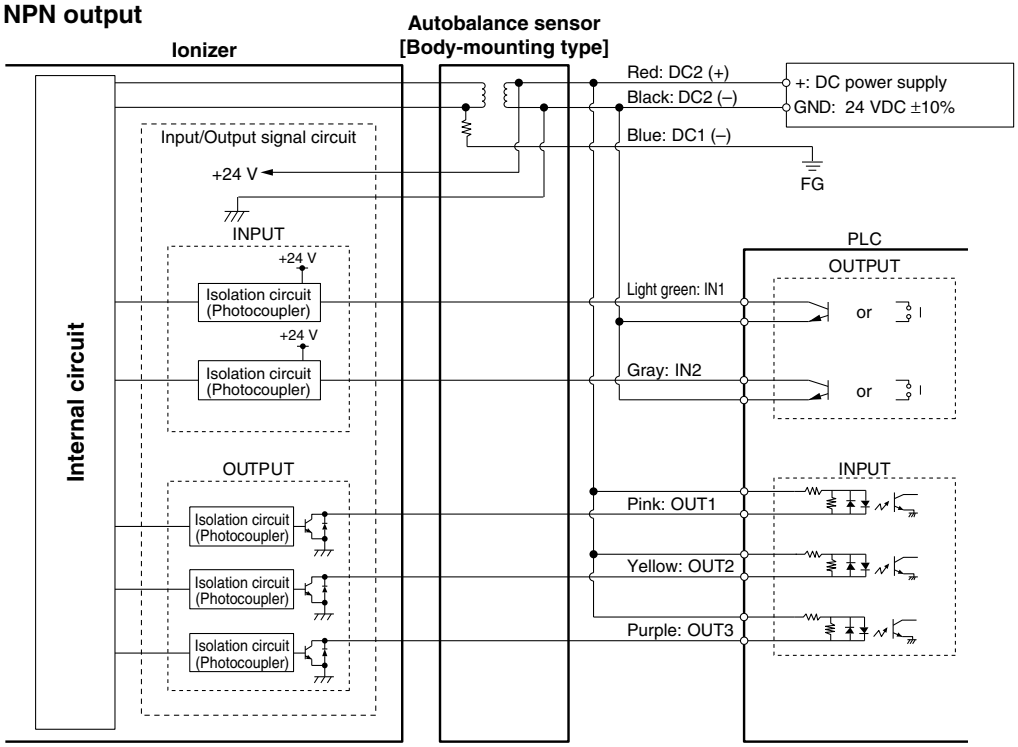
* Sensor monitor output lead (OUT4: Dark green) When the feedback sensor is used, the terminal outputs the potential measured by the feedback sensor as an analog signal. When the autobalance sensor is used, the terminal does not output signals.

The lead of the ionizer driving power supply (DC1) and the lead of the power supply for I/O signals (DC2) can be connected with a common power supply. When a common power supply is used, the lead DC1 (–) with Class-D grounded and leads for I/O signals are not insulated.

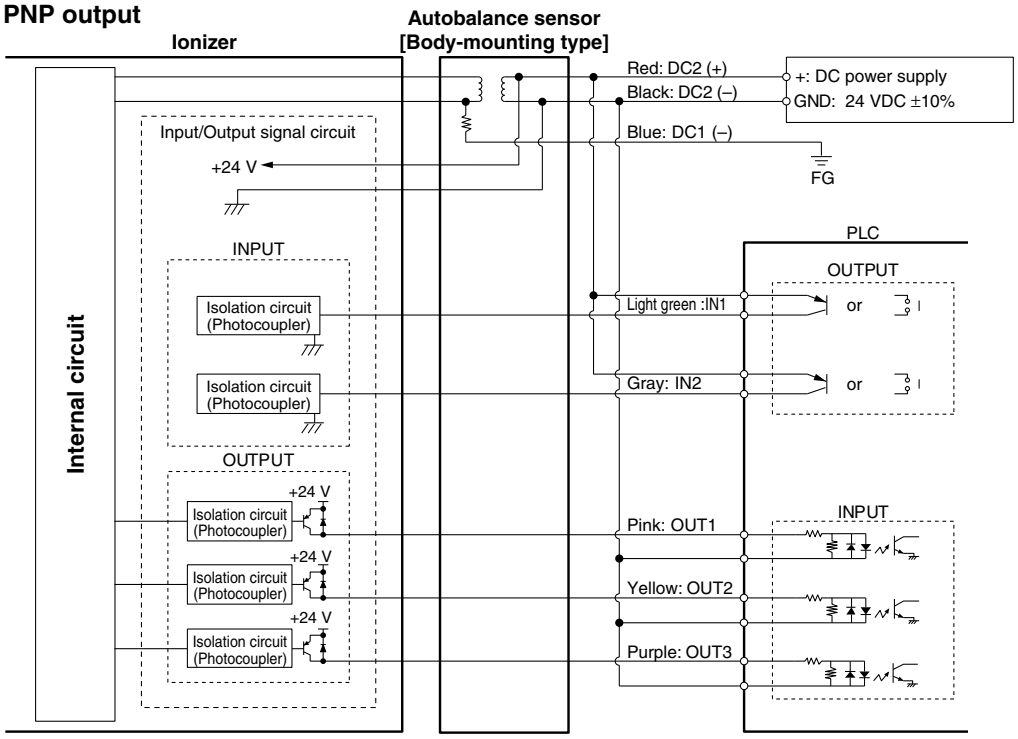
Circuit of Power Supply Cable Connection

(2) When an autobalance sensor [body-mounting type] is used.

NPN output



PNP output

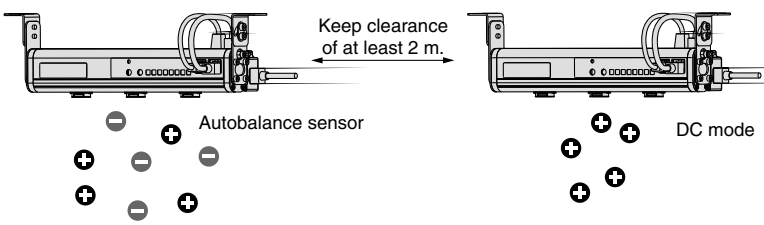


∗ Apply Class-D grounding to the lead DC (–) [Blue], and do not connect to the GND terminal of the power supply. When the lead is connected to the GND terminal of the power supply and Class-D grounding is applied, leads for I/O signals are not insulated from the FG terminal.

⚠Caution

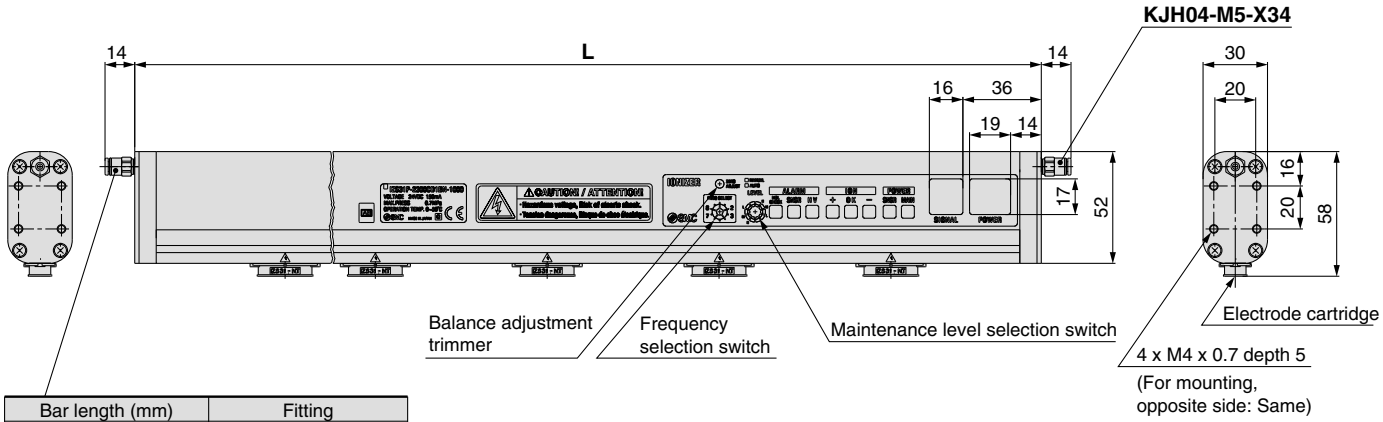
When using the autobalance sensor (body-mounting type) near the ionizer in DC mode, keep clearance of at least 2 m between them.

∗ If the clearance is not enough, the ions from the ionizer in DC mode affect the control of the autobalance sensor, thus resulting in imbalance of ions.



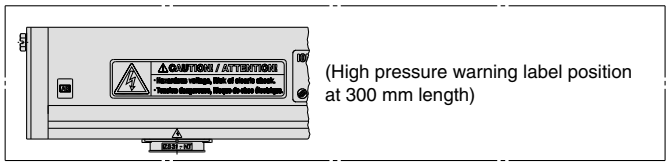
Dimensions

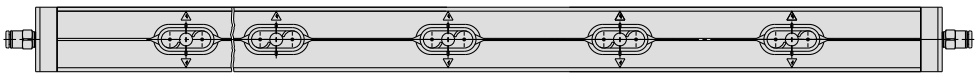
Ionizer / IZS31-□□□□-□□

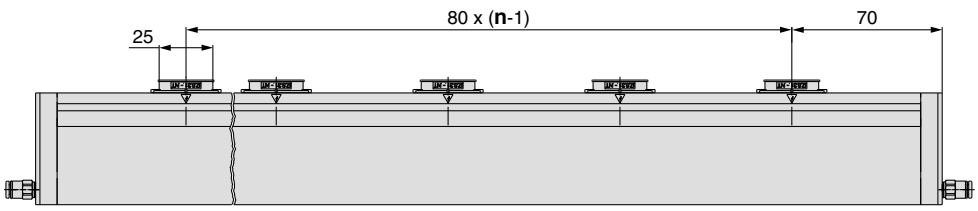


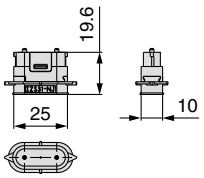
Bar length (mm)	Fitting
300, 380, 620, 780	**M-5P-X112**
1100, 1260, 1500, 1900, 2300	**KJH04-M5-X34** Note)

Note) Plug (M-5P-X112) 1 pc. is shipped together.

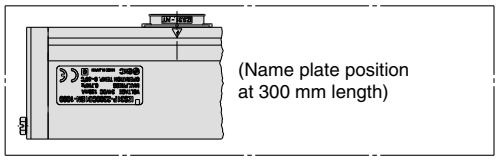








Electrode cartridge

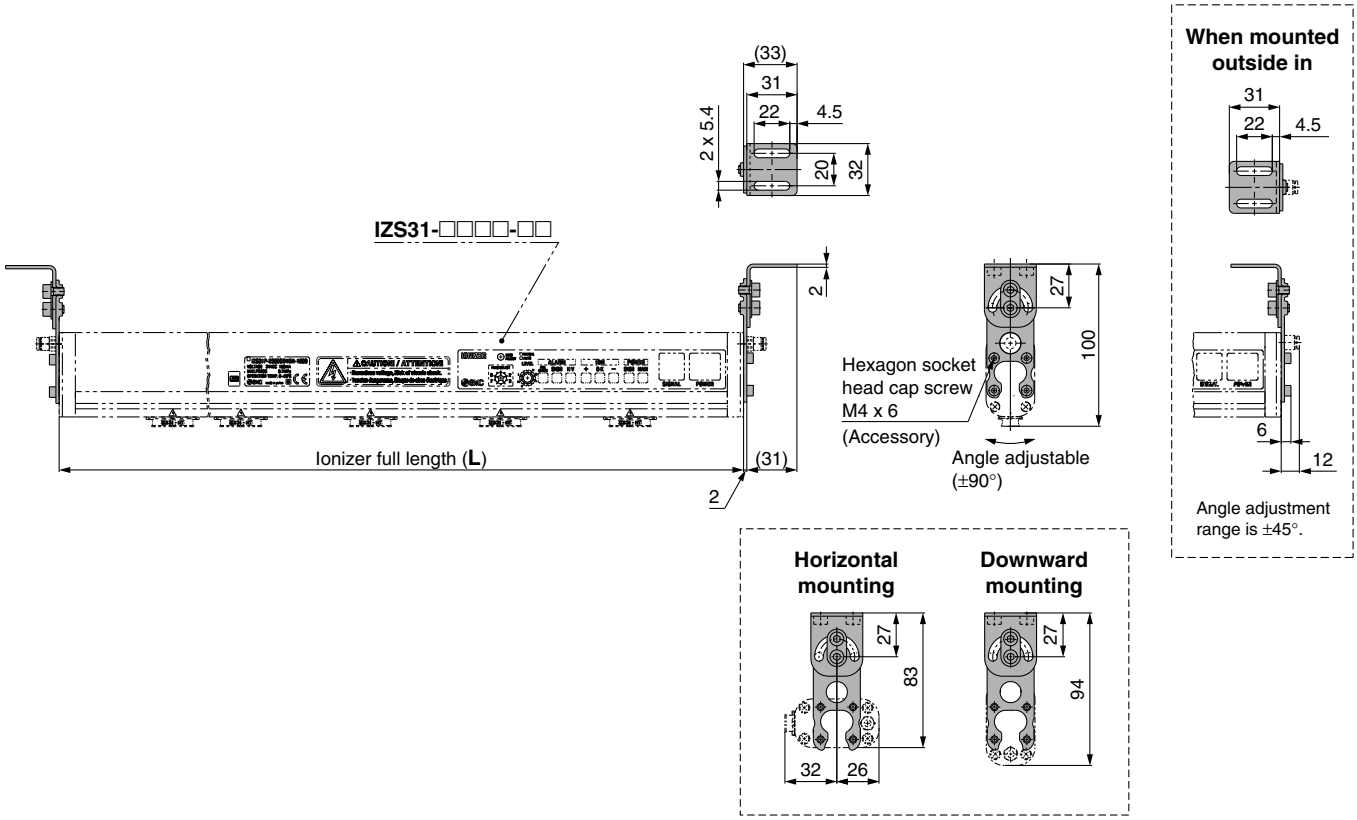


n (Number of electrode cartridges), L Dimension

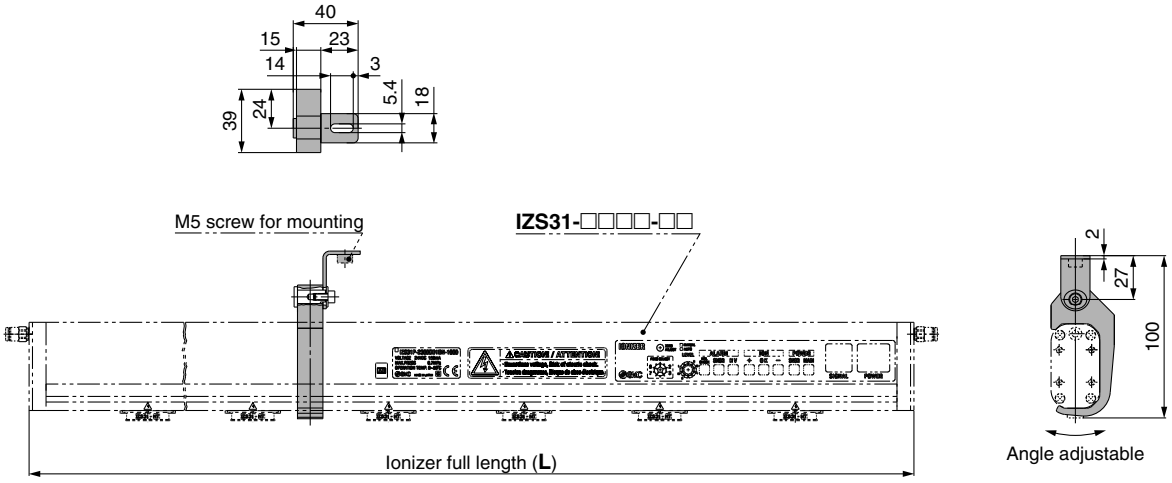
Part no.	n	L(mm)
IZS31-300	3	300
IZS31-380	4	380
IZS31-620	7	620
IZS31-780	9	780
IZS31-1100	13	1100
IZS31-1260	15	1260
IZS31-1500	18	1500
IZS31-1900	23	1900
IZS31-2300	28	2300

Dimensions

End bracket / IZS31-BE



Center bracket / IZS31-BM

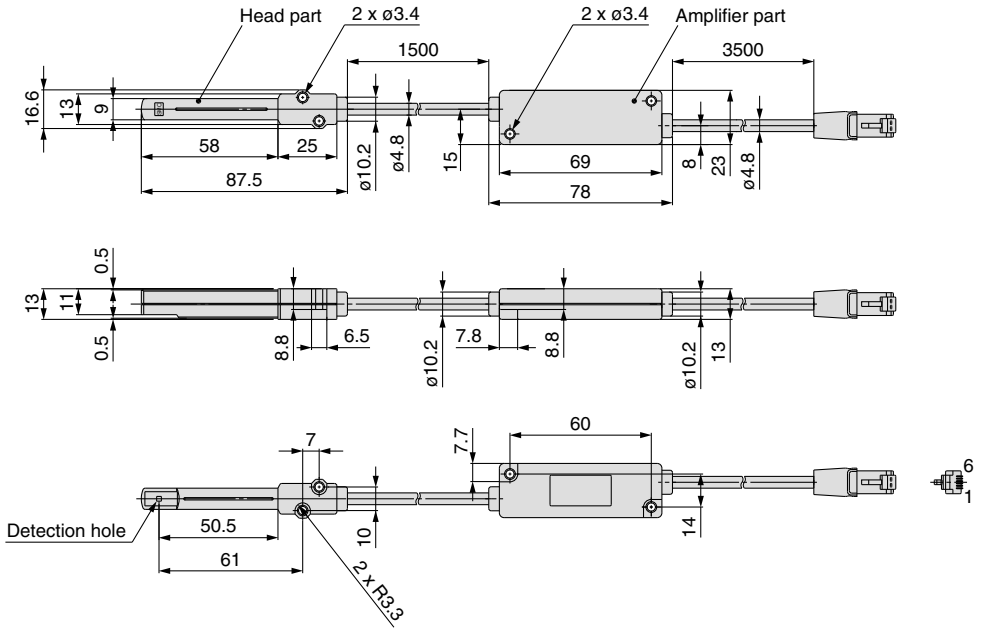


Note) Number of center brackets included in a model with brackets. (Refer to "How to Order" on page 5.)

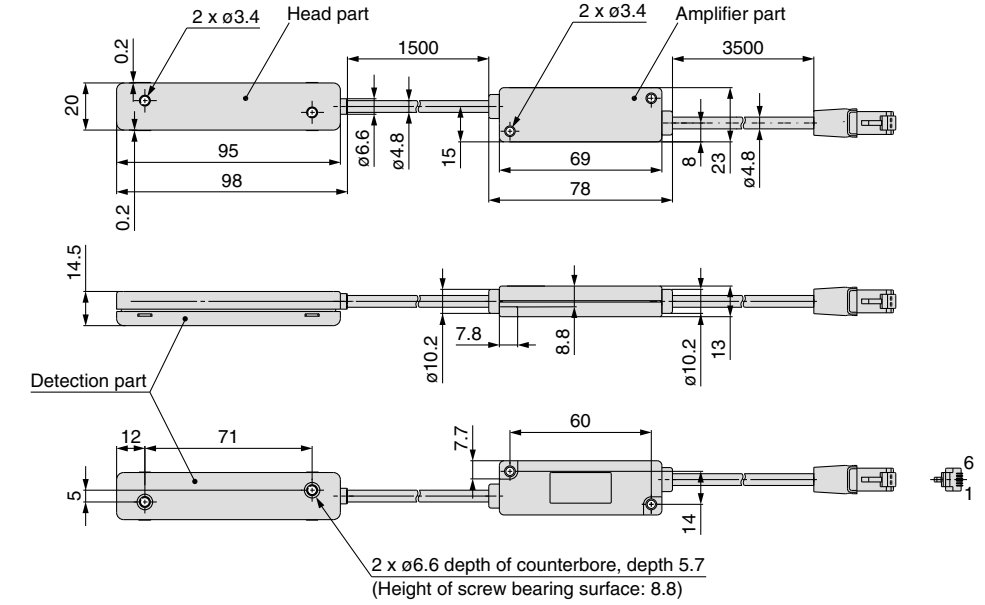
Bar length (mm)	Center bracket
300, 380, 620, 780	None
1100, 1260, 1500	With 1 pc.
1900, 2300	With 2 pcs.

Dimensions

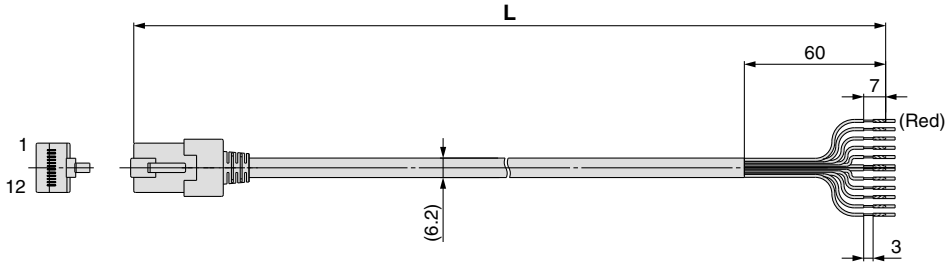
Feedback sensor / IZS31-DF



Autobalance sensor [High-precision type] / IZS31-DG



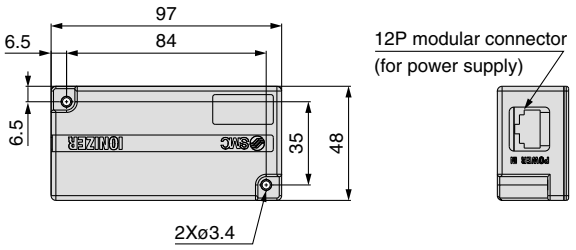
Power supply cable / IZS31-CP□

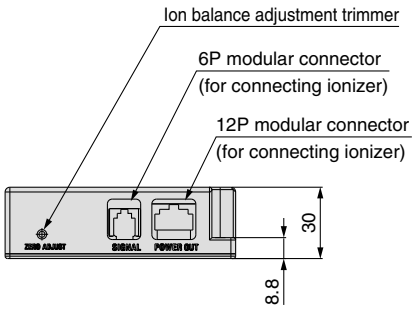


Model	**L**(mm)
IZS31-CP	3000
IZS31-CPZ	10000

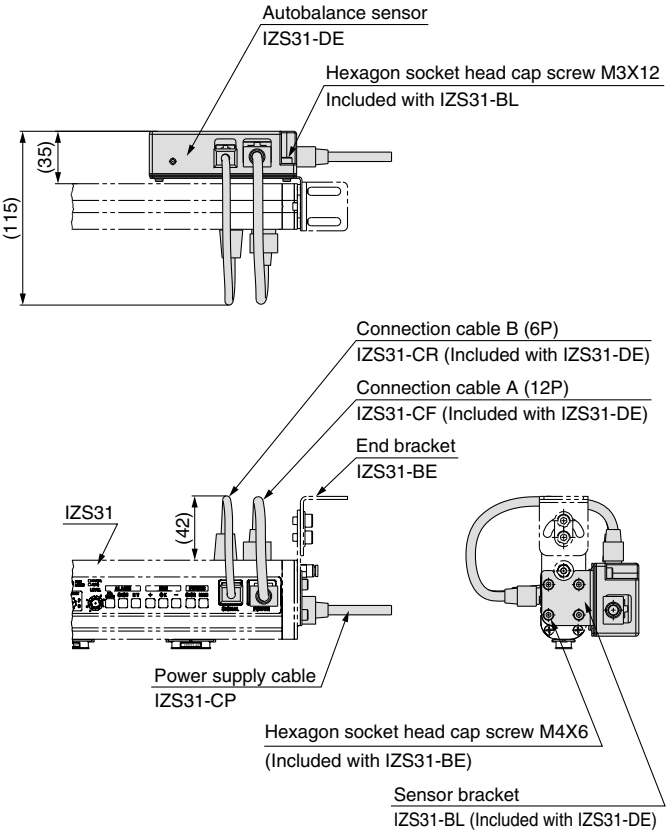
Dimensions

Autobalance sensor [Body-mounting type] / IZS31-DE



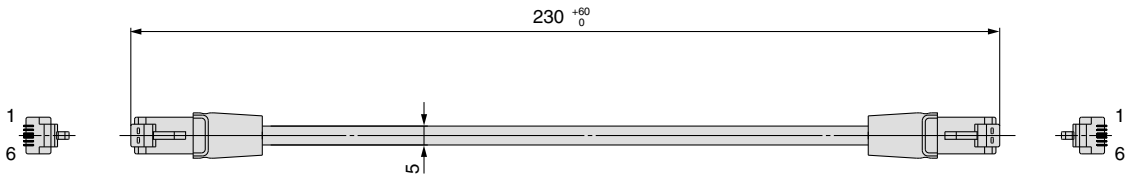


When mounting on the ionizer

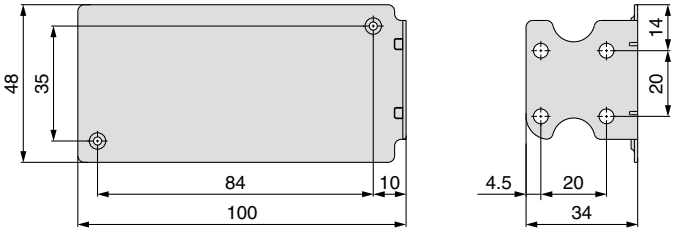


Connection cable A (12P) / IZS31-CF

Connection cable B (6P) / IZS31-CR



Sensor bracket / IZS31-BL



Series IZS31
Made to Order 1

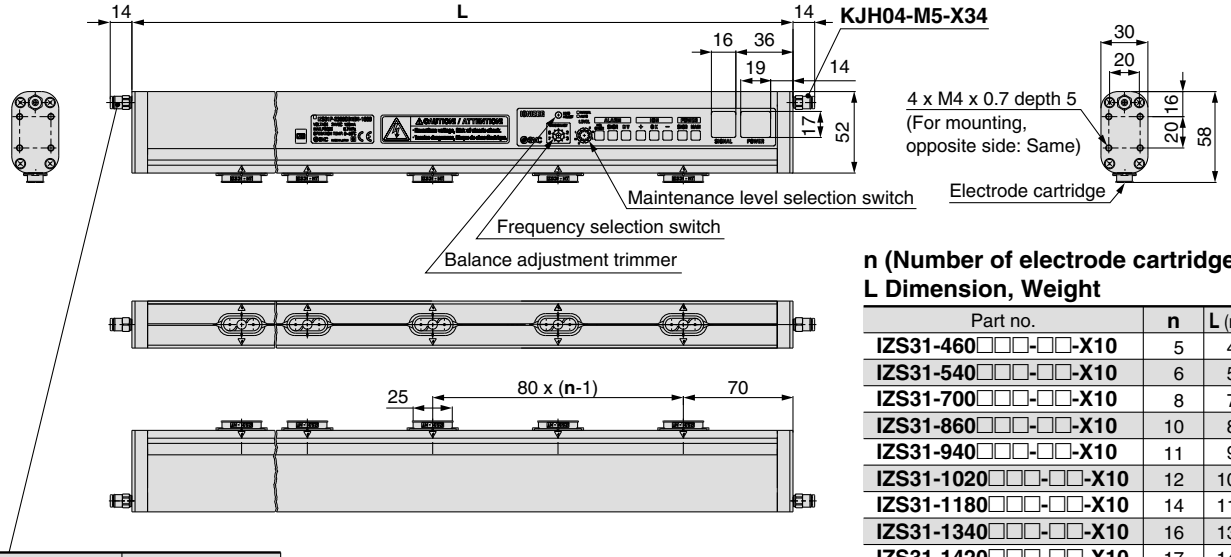
Please contact SMC for detailed dimensions, specifications, and lead times.

Made to Order

1 Non-standard bar length (80 mm-pitch)

Symbol **X10**

∗Refer to "How to Order" on page 5.



Bar length (mm)	Fitting
460, 540, 700	**M-5P-X112**
860, 940, 1020, 1180, 1340, 1420, 1580, 1660, 1740, 1820, 1980, 2060, 2140, 2220	**KJH04-M5-X34** Note)

Note) Plug (M-5P-X112) 1 pc. is shipped together.

Number of Center Brackets

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

n (Number of electrode cartridges), L Dimension, Weight

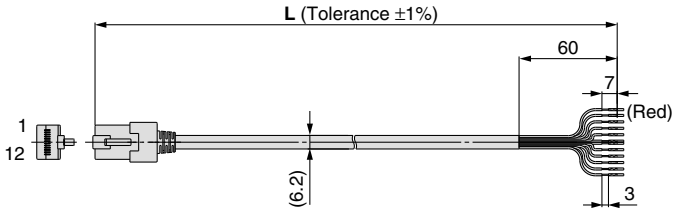
Part no.	n	L (mm)	Weight (g)
IZS31-460□□□-□□-X10	5	460	600
IZS31-540□□□-□□-X10	6	540	660
IZS31-700□□□-□□-X10	8	700	780
IZS31-860□□□-□□-X10	10	860	910
IZS31-940□□□-□□-X10	11	940	970
IZS31-1020□□□-□□-X10	12	1020	1040
IZS31-1180□□□-□□-X10	14	1180	1160
IZS31-1340□□□-□□-X10	16	1340	1290
IZS31-1420□□□-□□-X10	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

2 Non-standard power supply cable length

Symbol **X13**

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

Note 1) 11 m or longer power cables are not CE Marking-compliant.
Note 2) Use standard power 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

Made to Order 2

Please contact SMC for detailed dimensions, specifications, and lead times.

Made to Order

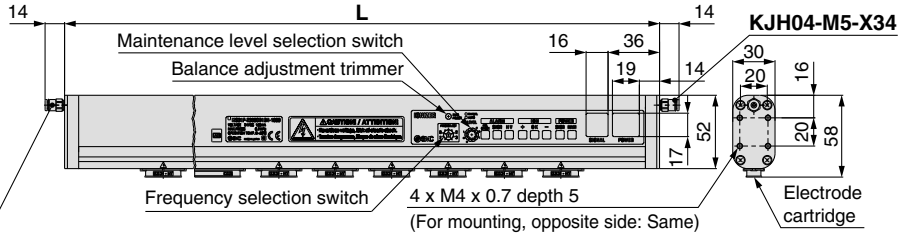
3 Model with 40 mm-pitch electrode cartridges

Symbol **X15**

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

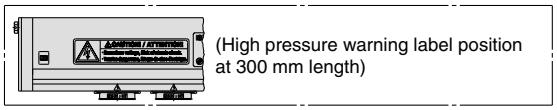
Note) The maximum bar length is 1260 mm.
The air purge nozzles are arranged at an 80 mm-pitch.

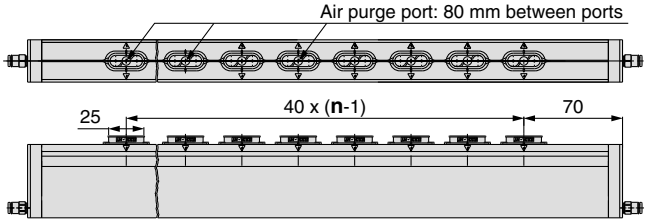
- Uneven static electricity elimination can be prevented when the installaction height is low.

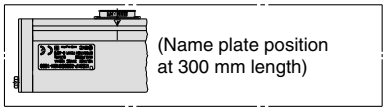


Bar length (mm)	Fitting
300, 380, 620, 780	**M-5P-X112**
1100, 1260	**KJH04-M5-X34** Note)

Note) Plug (M-5P-X112) 1 pc. is shipped together.



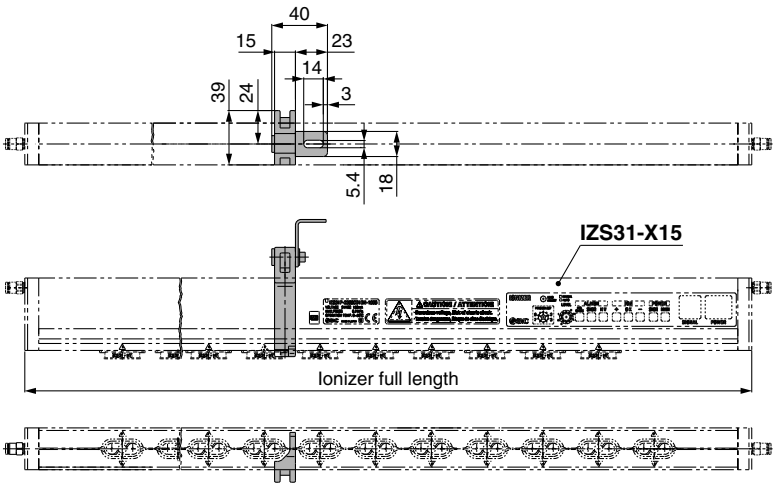


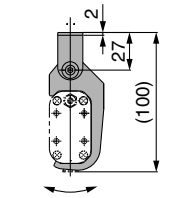


n (Number of electrode cartridges), L Dimension, Weight

Part no.	n	L (mm)	Weight (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

Center bracket / IZS31-BM-X158





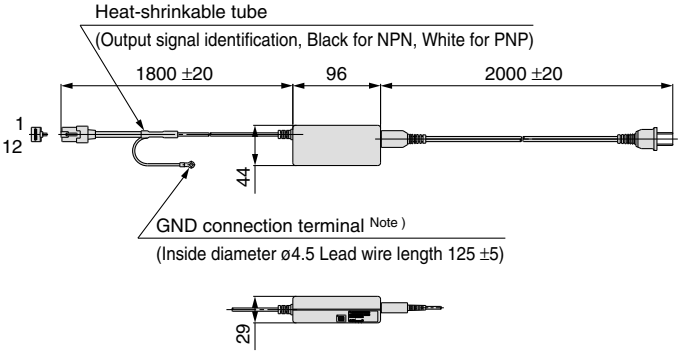
Note) Number of center brackets included in a model with brackets. (Refer to "How to Order" on page 5.)

Bar length (mm)	Center bracket
300, 380, 620, 780	None
1100, 1260	With 1 pc.

4 Ionizer driving AC adapter (100 to 240 VAC)

Symbol **X196**

Power can be directly supplied through the AC power line.
The ionizer starts operations on connecting the power supply plug to the AC power supply of 100 to 240 V.



Note) Be sure to apply Class-D grounding to the GND terminal.

How to Order

IZS31 − F□ −X196

- **Applicable output specifications**

Nil	NPN specification
P	PNP specification

Specifications

Input voltage	100 VAC to 240 VAC, 50/60 Hz
Output voltage	24 VDC
Output current	1A
Ambient temperature	0 to 40°C
Ambient humidity	35 to 65% Rh
Weight	220 g

Made to Order 3

Please contact SMC for detailed dimensions, specifications, and lead times.

Made to Order

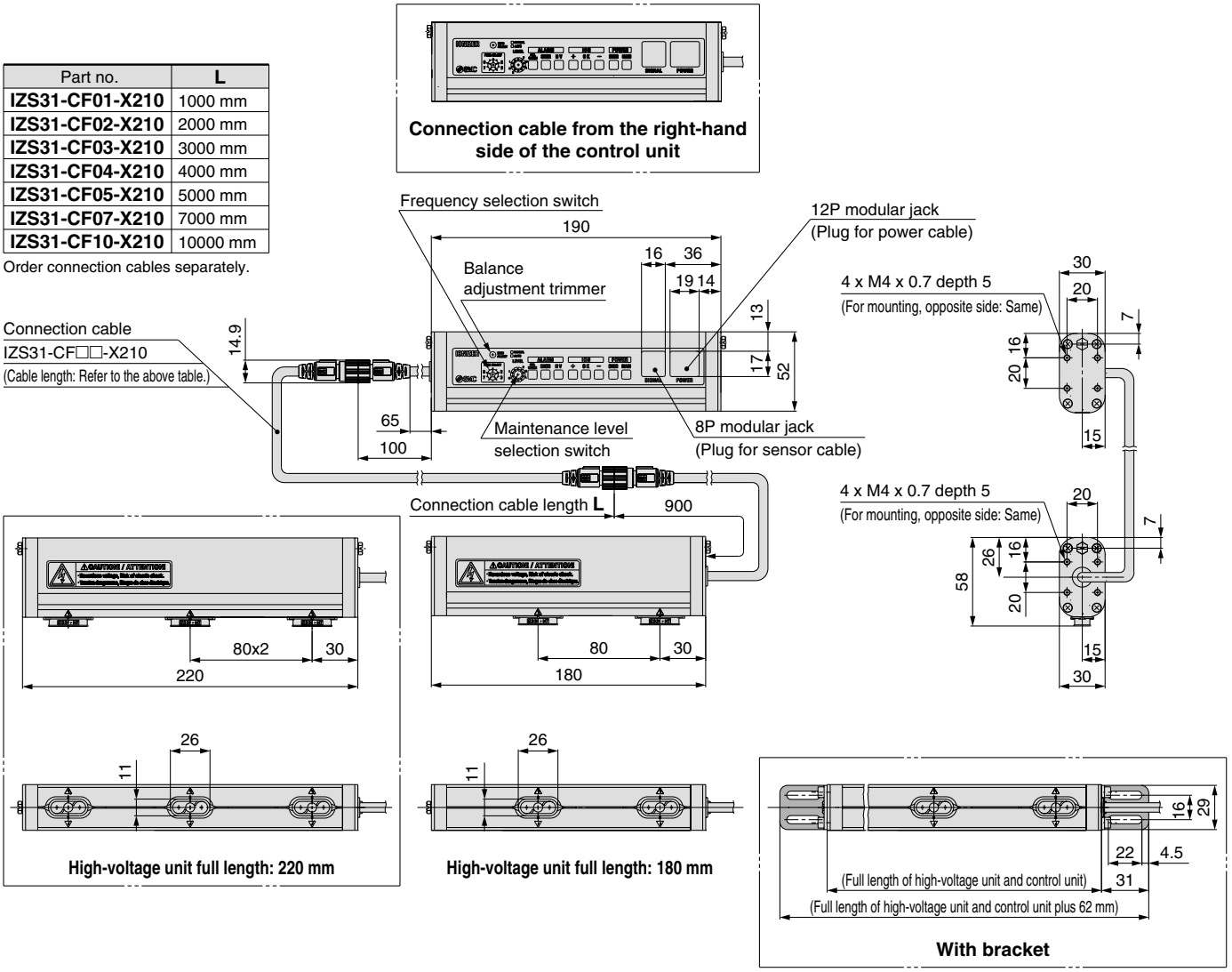
Symbol

5 High-voltage/control unit detachable short type — X210

● A short type ionizer (full length of 180 mm and 220 mm) can be installed in a small space.
The high-voltage unit (ionizing unit) and control unit are detachable from each other. The distance between them is also optional according to the length of selected connection cables.

Part no.	L
IZS31-CF01-X210	1000 mm
IZS31-CF02-X210	2000 mm
IZS31-CF03-X210	3000 mm
IZS31-CF04-X210	4000 mm
IZS31-CF05-X210	5000 mm
IZS31-CF07-X210	7000 mm
IZS31-CF10-X210	10000 mm

Order connection cables separately.



How to Order

IZS31 – 180 □ □ R □ – □ □ – X210

Bar type

High-voltage unit full length

180	180 mm
220	220 mm

Electrode needle material

Nil	Tungsten
C	Silicon
S	Stainless steel
J	Low-maintenance type / Tungsten
K	Low-maintenance type / Silicon

Output specification

Nil	NPN output
P	PNP output

Control unit cable entry direction

Nil	Left-hand entry
R	Right-hand entry

Power supply cable

Nil	With power supply cable (3 m)
Z	With power supply cable (10 m)
N	Without power supply cable

Bracket

Nil	Without bracket
B	With bracket Note)

Note) Four end brackets are bundled with the bracket model. Brackets can be attached on the high-voltage unit and control unit.

Sensor

Nil	Without sensor
E	Autobalance sensor [Body-mounting type]
F	Feedback sensor
G	Autobalance sensor [High-precision type]

SMC

Series IZS31
Made to Order 4

Please contact SMC for detailed dimensions, specifications, and lead times.

Made to Order

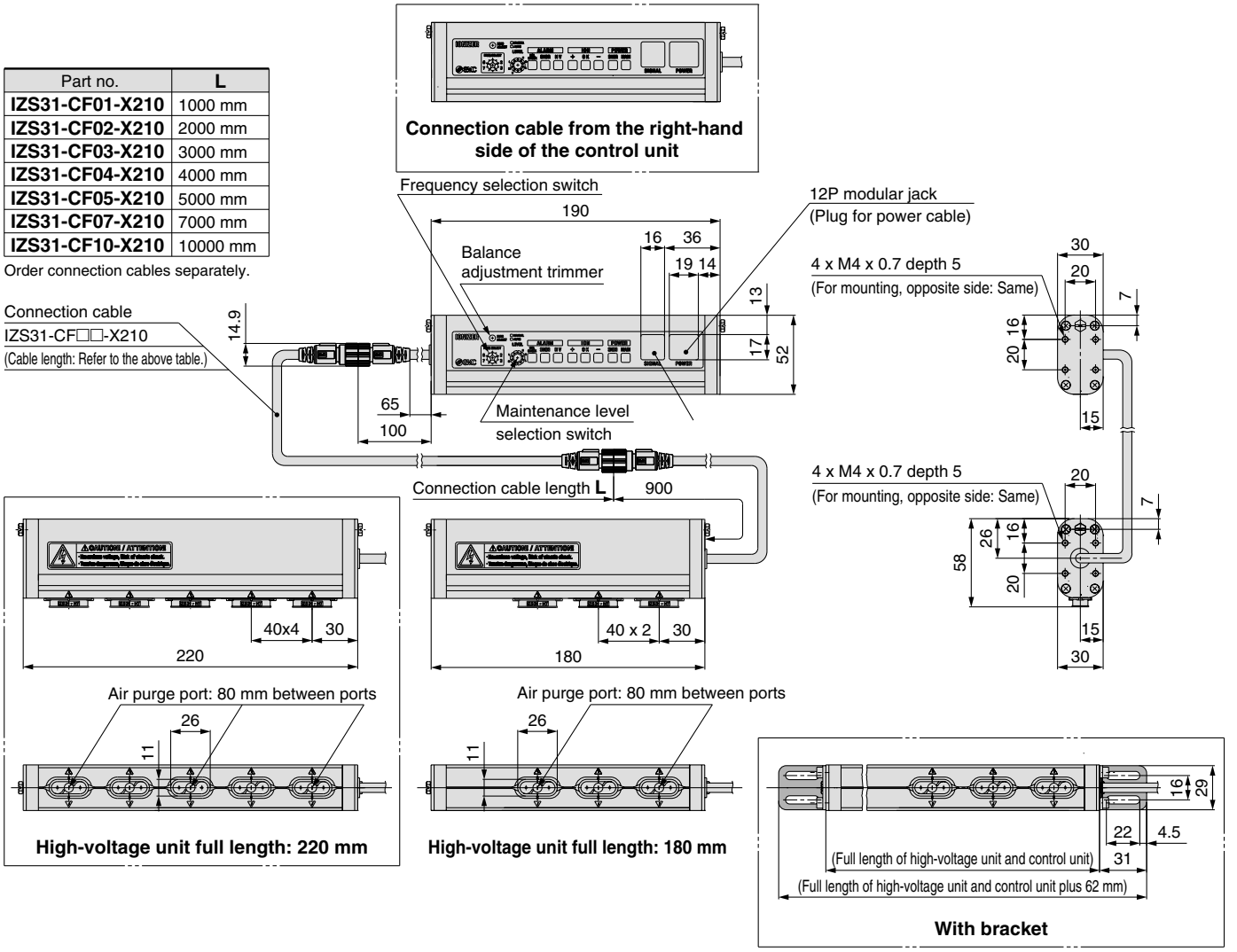
Symbol

6 High-voltage/control unit detachable short type with 40 mm-pitch electrode cartridges — X211

● A short type ionizer (full length of 180 mm and 220 mm) can be installed in a small space.
The high-voltage unit (ionizing unit) and control unit are detachable from each other. The distance between them is also optional according to the length of selected connection cables.
Model with 40 mm-pitch electrode cartridges

Part no.	L
IZS31-CF01-X210	1000 mm
IZS31-CF02-X210	2000 mm
IZS31-CF03-X210	3000 mm
IZS31-CF04-X210	4000 mm
IZS31-CF05-X210	5000 mm
IZS31-CF07-X210	7000 mm
IZS31-CF10-X210	10000 mm

Order connection cables separately.



How to Order

IZS31 – 180 □ □ R □ – □ □ – X211

High-voltage unit full length

180	180 mm
220	220 mm

Bar type

Electrode needle material

Nil	Tungsten
C	Silicon
S	Stainless steel
J	Low-maintenance type / Tungsten
K	Low-maintenance type / Silicon

Output specification

Nil	NPN output
P	PNP output

Control unit cable entry direction

Nil	Left-hand entry
R	Right-hand entry

Power supply cable

Nil	With power supply cable (3 m)
Z	With power supply cable (10 m)
N	Without power supply cable

Bracket

Nil	Without bracket
B	With bracket Note)

Note) Four end brackets are bundled with the bracket model. Brackets can be attached on the high-voltage unit and control unit.

Sensor

Nil	Without sensor
E	Autobalance sensor [Body-mounting type]
F	Feedback sensor
G	Autobalance sensor [High-precision type]

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

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

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

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

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

⚠Warning

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

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.
1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠Caution

1. The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Safety Instructions	Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

Series IZS31
Ionizers
Precautions 1
Be sure to read this before handling.

Selection

⚠Warning

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

If considering using the product for other applications (especially those stipulated in 4 on back page 1), please consult with SMC beforehand.

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

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

3. Use clean compressed air for fluid.

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

4. This product is not explosion-protected.

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

⚠Caution

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

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 malfunction, wire breakage, fire or air leakage.

Minimum bending radius:
Power suppy cable, connection cable A ……35 mm
Sensor cable, connection cable B……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. Mount this product 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 may 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 mounting the ionizer. Refer to the below 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.

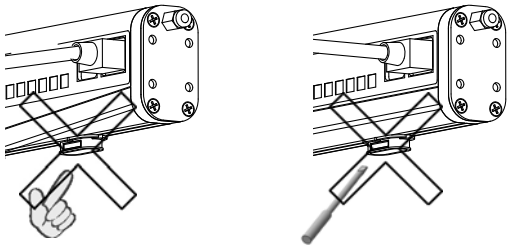
Thread size	Recommended tightening torque
M3	0.61 to 0.63 N·m
M4	0.73 to 0.75 N·m
M5	1.3 to 1.5 N·m

5. Do not touch the electrode needle directly with fingers or metalic tools.

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

⚠Danger High Voltage!

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



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

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

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

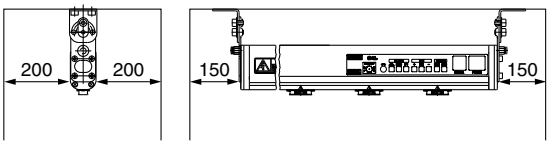
Series IZS31
Ionizers
Precautions 2
Be sure to read this before handling.

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 elimination and therefore result in a decrease in efficiency.



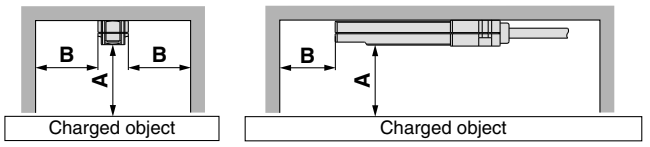
Unit: mm

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

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

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

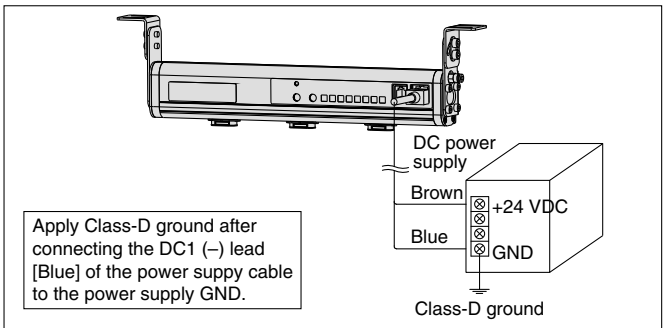
Always use a UL Listed/Recognized power supply (24 VDC, Class-2 output of 2.1 A or less).

Wiring / Piping

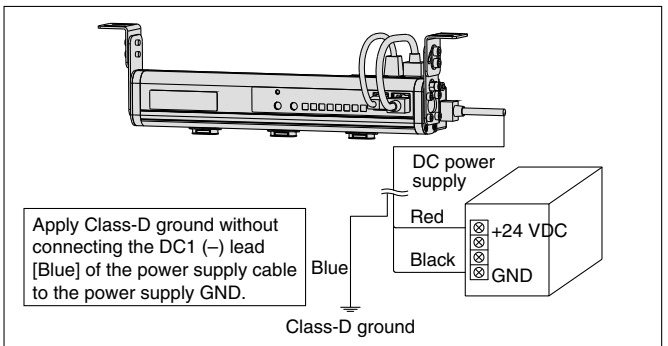
⚠Warning

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.



When using the feedback sensor
When using the autobalance sensor (high-precision type)



When using the autobalance sensor (body-mounting type)

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 piping this product, exercise caution to prevent particles, water drops, or oil contents from entering the piping.

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Series IZS31
Ionizers
Precautions 3
Be sure to read this before handling.

Operating Environment / Storage Environment

⚠Warning

1. Observe the 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.

a) Avoid using in a place that exceeds an ambient temperature range of 0 to 50°C.

b) Avoid using in a place that exceeds an ambient humidity range of 35 to 80% Rh.

c) Avoid using in a place where condensation occurs due to a drastic temperature change.

d) Avoid using in a place in the presence of corrosive or explosive gas or where there is a volatile combustible.

e) Avoid using in an atmosphere where there are particles, conductive iron powders, oil mist, salt, solvent, blown dust, cutting oil (water, liquid), etc.

f) Avoid using in a place where ventilated air from an air conditioner is directly applied to the product.

g) Avoid using in a closed place without ventilation.

h) Avoid using in direct sunlight or radiated heat.

i) Avoid using in a place where there is a strong magnetic noise (strong electric field, strong magnetic field, or surge).

j) Avoid using in a place where static electricity is discharged to the body.

k) Avoid using in a place where a strong high frequency occurs.

l) Avoid using in a place where this product is likely to be damaged by lightning.

m) Avoid using in a place where direct vibration or shock is applied to the body.

n) Avoid using in a place where there is a force large enough to deform the body 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 (Series IDF), air filter (Series AF/AFF), and mist separator (Series AFM/AM).

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

Maintenance

⚠Warning

1. Periodically (every two weeks or so) 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.
If particles attach to the electrode needle by using for long periods of time, the static electricity eliminating performance will be lowered.
Replace the electrode cartridge, if the pins are rough and the static electricity eliminating performance does not return even after being cleaned.

⚠Danger High Voltage!

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

2. When cleaning the electrode needle or replacing the electrode cartridge, be sure to turn off the power supply to the 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 excercise caution because the product will not be warrantied.

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 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.

Related Products

Ionizer Nozzle type *Series IZN10*

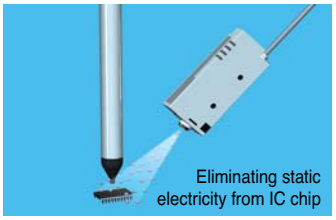
Dust removal and static electricity elimination by air blow

• Eliminates dust clinging to lamp cover.

Spot type static electricity elimination

• Prevents electrostatic breakdown of electric parts.

• Prevents detachment failure.



Ion balance ±10 V (In case of energy-saving static electricity elimination nozzle)

Slim design: Thickness 16 mm

RoHS compliant

1 Electrode needle contamination detector

Outputs maintenance signal when detects stain or wear of an electrode needle always.

Detects optimal maintenance time, reduced labor for maintenance.

2 Built-in power supply substrate

High-voltage power supply cable/ external high-voltage power supply are unnecessary.

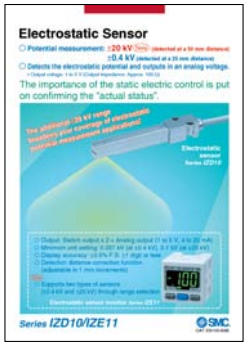
CAT.ES100-72

Electrostatic Sensor *Series IZD10* / Electrostatic Sensor Monitor *Series*

Electrostatic Sensor *Series IZD10*

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

- **Potential measurement: ± 20 kV (detected at a 50 mm distance)**
  ± 0.4 kV (detected at a 25 mm distance)
- **Detects the electrostatic potential and outputs in an analog voltage**
  • Output voltage: 1 to 5 V (Output impedance: Approx. 100 Ω)
- **Possible to measure electrostatic potential**



Electrostatic Sensor Monitor *Series IZE11*

- **Output: Switch output x 2 + Analog output (1 to 5 V, 4 to 20 mA)**
- **Minimum unit setting: 0.001 kV (at ±0.4 kV), 0.1 kV (at ±20 kV)**
- **Display accuracy: ±0.5% F.S. ±1 digit or less**
- **Detection distance correction function (adjustable in 1 mm increments)**
- **Range switching supports two sensors. (±0.4 kV, ±20 kV)**

CAT.ES100-65

Handheld Electrostatic Meter *Series IZH10*

The importance of the static electric control is put on confirming the "actual status".
Easy-to-use handheld electrostatic meter

- **Measuring range: ±20.0 kV**
- **Minimum unit display: 0.1 kV (±1.0 to ±20.0 kV)**
  0.01 kV (0 to ±0.99 kV)
- **Compact & Lightweight: 85 g (excluding dry cell batteries)**
- **Backlight for reading in the dark**
- **LOW battery indicator**
- **Peak/Bottom display function**
- **Zero-out function**
- **Auto power-off function**

CAT.ES100-69

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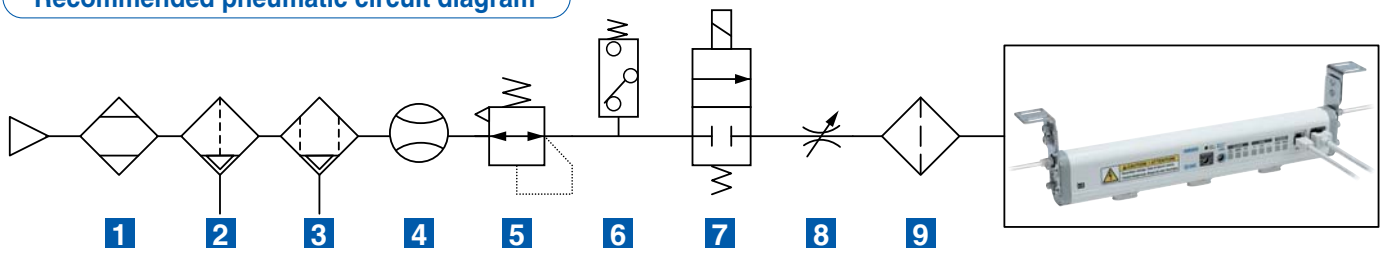
SMC can provide all the equipment required to supply air to the ionizer.
Consider the equipment below not only for providing an “opportunity to decrease maintenance” and “preventing damage” but also for an “energy-saving countermeasure”.

Recommended pneumatic circuit diagram



1 Air Dryer / Series IDF

Decreases the dew point of compressed air. Limits moisture generation which can lead to damage.

2 Air Filter / Series AF

Eliminates solid foreign matter such as powder particles in the compressed air.

3 Mist Separator / Series AFM

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

4 Digital Flow Switch / Series PF2A

Decreases the air consumption by flow control.

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 Restrictor / Series AS-X214

Regulates to the appropriate air volume depending upon the installation condition. Decreases the air consumption.

9 Clean Air Filter / Series SFD

Built-in capillary element
Nominal filtration rating: 0.01 µm
Adopted hollow fiber elements with over 99.99% filtering efficiency do not contaminate workpieces.

SMC Static Electricity Prevention Equipment

P-E06-15

Contents

Revision history		
Edition B	∗ Addition of Autobalance sensor [Body-mounting type] ∗ Addition of Electrode cartridge with low maintenance ∗ Made to Order Addition of center bracket to Model with 40 mm-pitch electrode cartridges (X15) Addition of AC adapter (X196) Addition of High-voltage/control unit detachable short type (X210) Addition of High-voltage/control unit detachable short type with 40 mm-pitch electrode cartridges (X211) ∗ Number of pages from 36 to 48	NO
Edition C	∗ Change of name plate and high pressure warning label attachment positions ∗ Made to Order Change of connection cable and cable connector for high-voltage/control unit detachable short type (X210, X211)	OZ

SMC Corporation

Akihabara UDX 15F,
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN
Phone: 03-5207-8249 Fax: 03-5298-5362
URL http://www.smcworld.com

Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

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