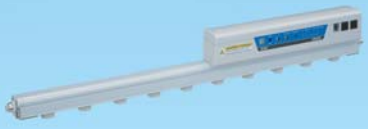
Ionizer

New

CE RoHS

Potential amplitude: 25 V or less [Note 1)]

Rapid elimination of static electricity: As little as 0.1 seconds [Note 2)]



Dual AC type *Series IZS42*

Reduced potential amplitude.

Feedback sensor type *Series IZS41*

Feedback sensor enables the rapid elimination of static electricity.

Standard type *Series IZS40*

Simple operation: only power ON/OFF required.

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 with air purge)

Series IZS40/41/42

SMC

CAT.EUS100-97A-UK

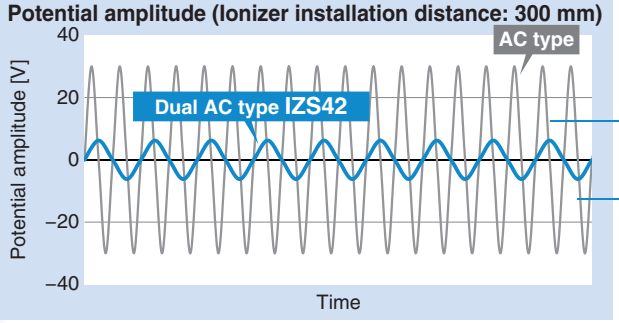
Dual AC type Series IZS42 (Reduced potential amplitude)

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

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

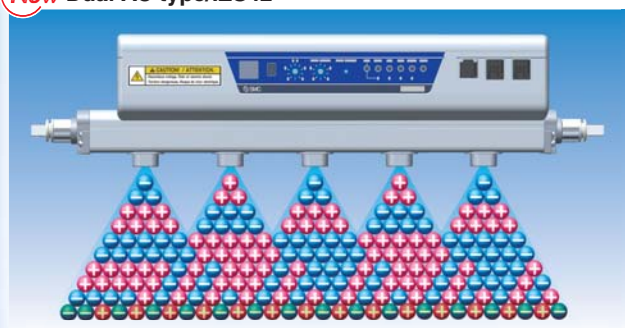
Potential amplitude is reduced with **SMC's original Dual AC type ionizer**.
Static electricity elimination may be achieved without causing damage to devices which are sensitive to electrostatic discharge (ESD).
Potential amplitude applied to the workpiece is reduced even when it is installed close to the ionizer.

Potential amplitude (Ionizer installation distance: 300 mm)



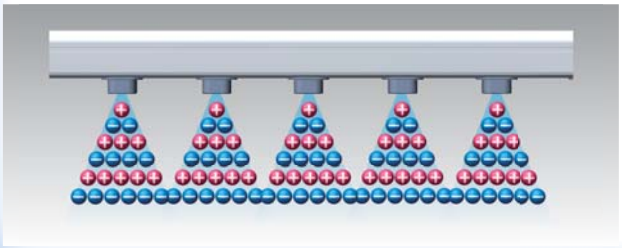
Original Dual AC type is introduced.

New Dual AC type/IZS42



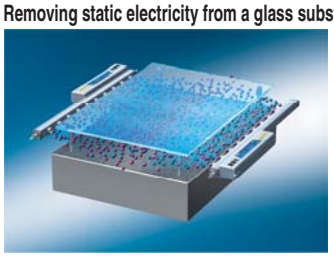
+ and - ions are discharged at the same time so that they reach the workpiece evenly mixed, which reduces the potential amplitude.

AC type



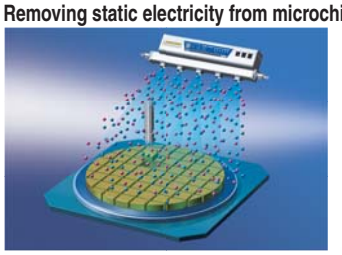
Layers of the same polarity ions reach the workpiece at the same time, which increases the potential amplitude.

Removing static electricity from a glass substrate



Prevents damage to glass substrates caused by static electricity generated when substrate is lifted from the surface plate.

Removing static electricity from microchips



Prevents damage to semiconductor microchips caused by static electricity generated when the microchips are picked up after dicing.

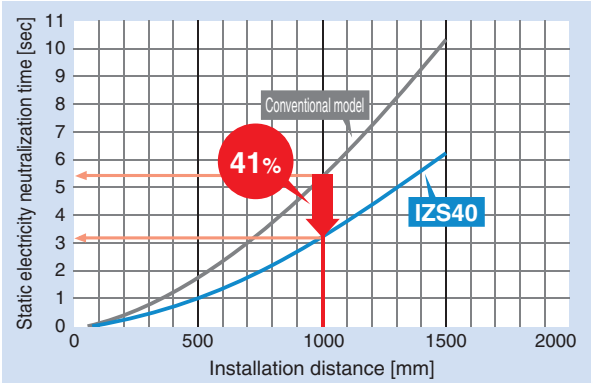
Standard type Series IZS40

Simple operation: only power ON/OFF required.

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

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

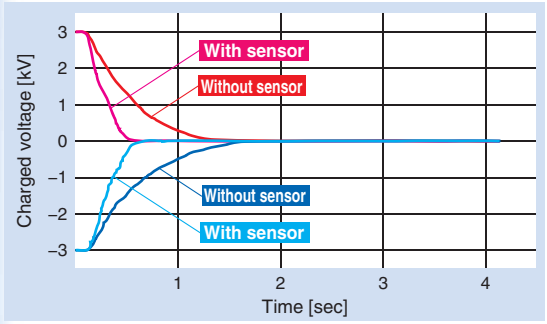
Conditions: Ion generation frequency 30 Hz Supply pressure: 0.1 MPa
IZS40 used with high speed electrode cartridge.

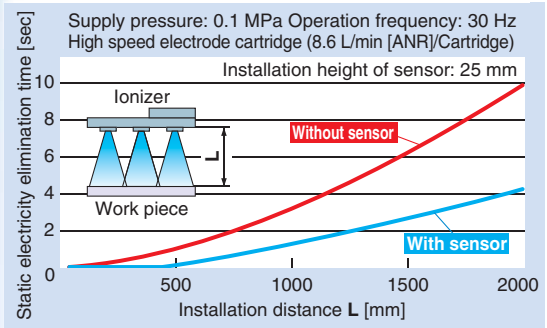


Feedback sensor type *Series IZS41* (High speed)

Rapid elimination of static electricity by a feedback sensor

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

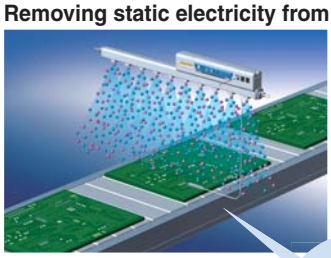




Feedback sensor

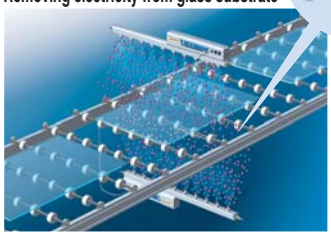
Detects the polarity of an object and measures the voltage.

Removing static electricity from PCBs



·Prevents damage caused by ESD.
·Prevents adhesion of dust.

Removing electricity from glass substrate



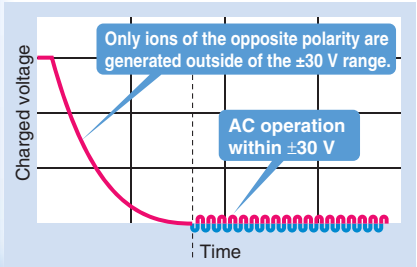
·Prevents damage due to adhesion of substrates and ESD.
·Prevents adhesion of dust.

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

■**Energy saving run mode** To reduce power consumption ion generation is halted once neutralization is complete.

■**Continuous neutralization run mode** After neutralization, the ionizer switches to AC mode. Continues to neutralize, even when the ion balance is with ±30V.

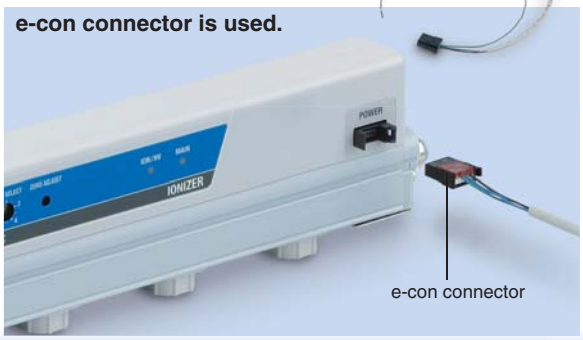
Continuous neutralization run mode



Mode		Ion emission waveform
Sensing AC	Energy saving	+ / − Stop
	Continuous Neutralization	+ / −
AC (Without sensor)		+ / −
Workpiece charge		⊕⊕⊕⊕⊕ Static electricity elimination completion

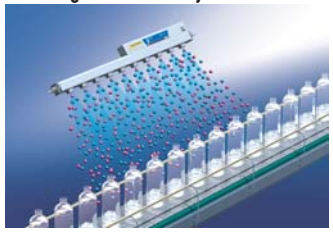
- **AC power supply adapter is available.**

e-con connector is used.



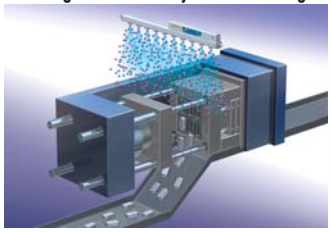
Suitable for static electricity elimination of resin and rubber pieces (small parts).

Removing static electricity from PET bottles



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

Removing static electricity from moulded goods



·Improves detachment from die.

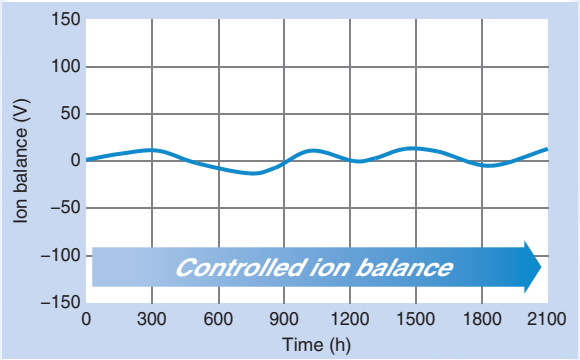
Reduction of adjustment and maintenance time using an auto balance sensor IZS41 IZS42

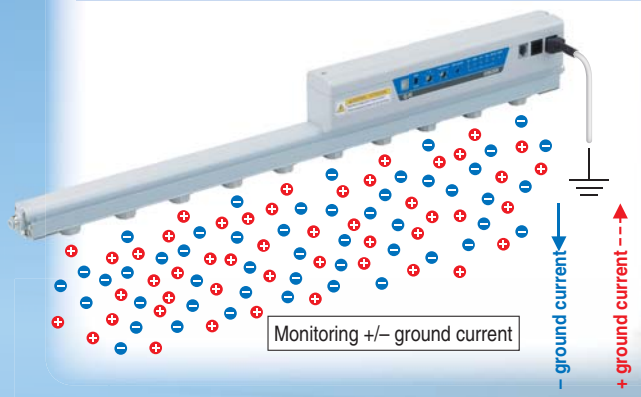
Built-in type (Standard)

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

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

Ion balance (image)



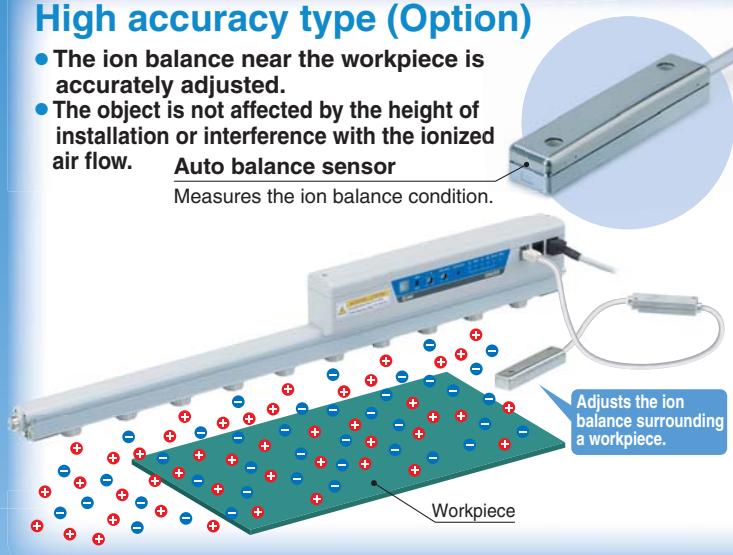


High accuracy type (Option)

- **The ion balance near the workpiece is accurately adjusted.**
- **The object is not affected by the height of installation or interference with the ionized air flow.**

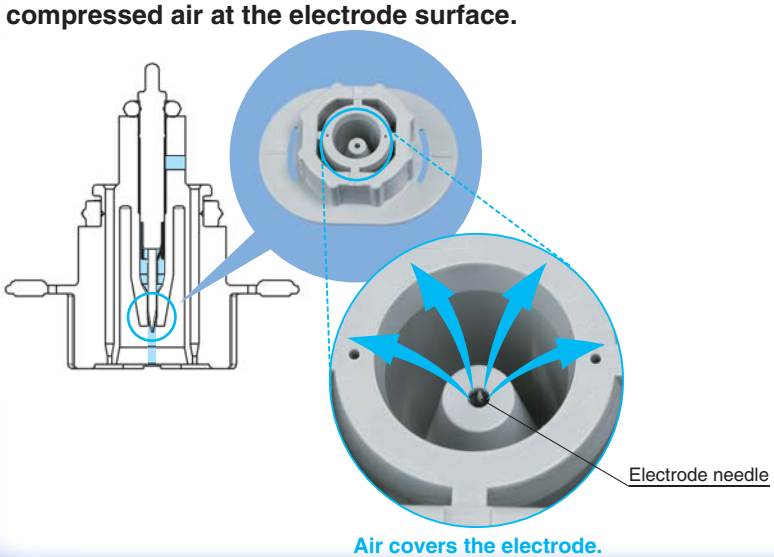
Auto balance sensor

Measures the ion balance condition.



Low maintenance electrode cartridges are used. IZS40 IZS41 IZS42

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



Air covers the electrode.

- **2 types of electrode material**

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

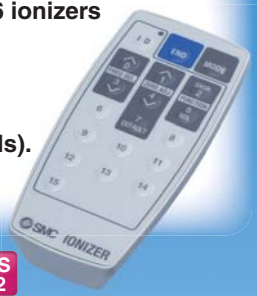
Tungsten
(Cartridge colour: white)

Silicon
(Cartridge colour: grey)

Refer to Features 5 for Models and Functions.

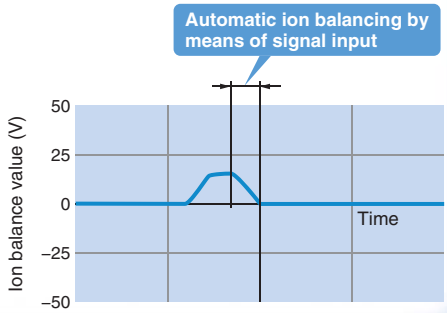
Setting ionizer with remote control IZS41 IZS42

- 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 enable/disable may be selected.



- "Ion balance adjustment only on external signal input" or "Ion balance adjustment at any time" can be selected.

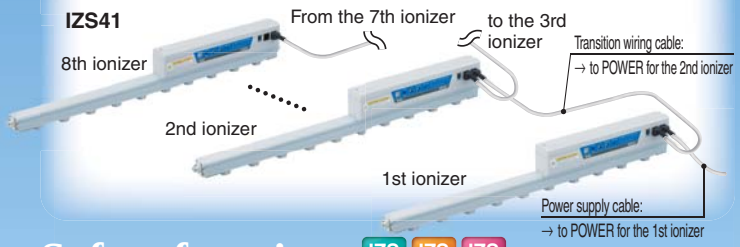
The auto balance sensor only needs to be connected when adjusting the ion balance.



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

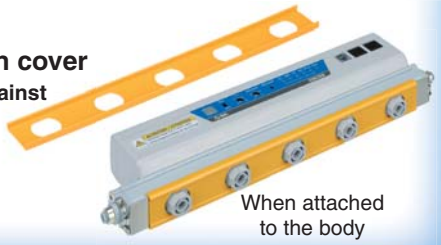
Reduction in labour time required to connect power supply.



Safety functions IZS40 IZS41 IZS42

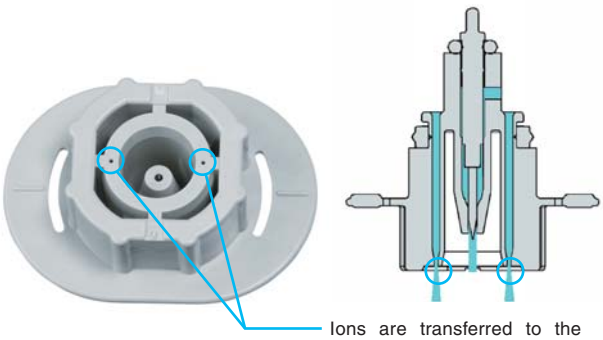
- **Electrode cartridge drop prevention function**
  Locking by double-action

- **Drop prevention cover**
  Extra safeguard against falling electrode cartridges



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

High speed cartridge

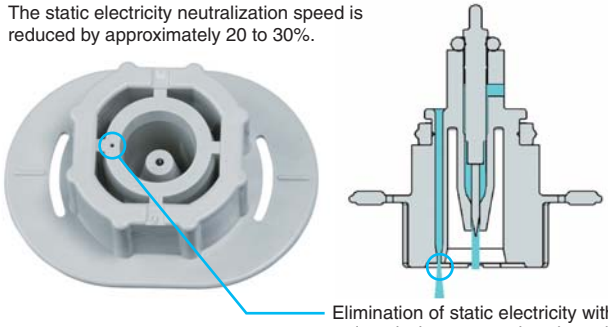


Ions are transferred to the workpieces efficiently by using two pneumatic nozzles to improve the static electricity removal performance.

Energy saving type cartridge

The air consumption of the energy-saving cartridge is approximately **50%** less than that of the high speed cartridge.

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

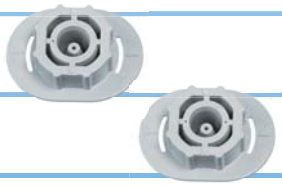


Elimination of static electricity with reduced air consumption through the use of one pneumatic nozzle.

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 contamination detector		●	●	—
High voltage error detection		●	●	●
Low maintenance electrode		●	●	●
Electrode cartridge	Energy saving	●	●	●
	High speed			
With one-touch fitting (ø6, ø8, ø10)		●	●	●
Bracket mount		●	●	●
Non-standard bar length (Made to Order)		●	●	●



Note 1) Order transition wiring separately.

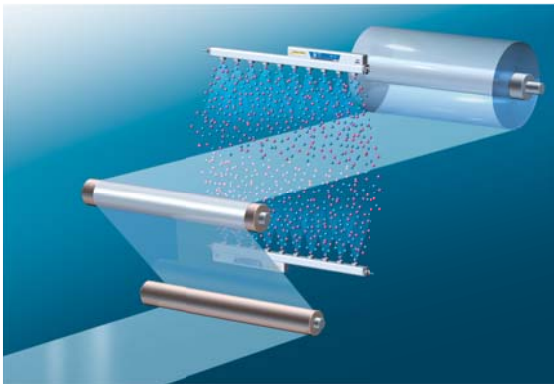
Accessories sold separately (per series)

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

Application Examples

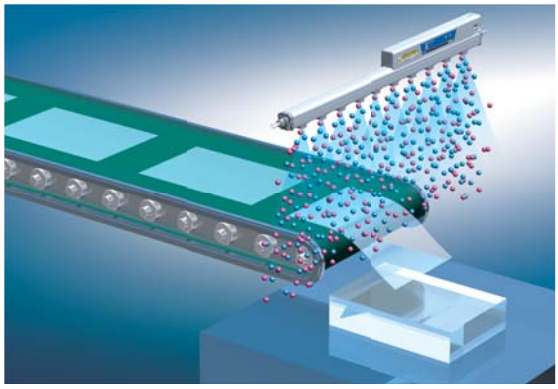
Eliminating static electricity from films

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



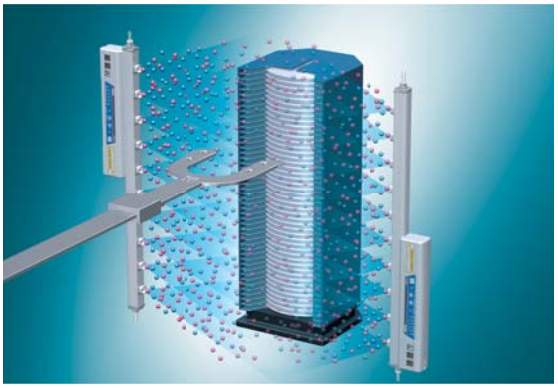
Eliminating static electricity on film molded goods

· Prevents adhesion to conveyer. · Prevents scattering of finished goods.



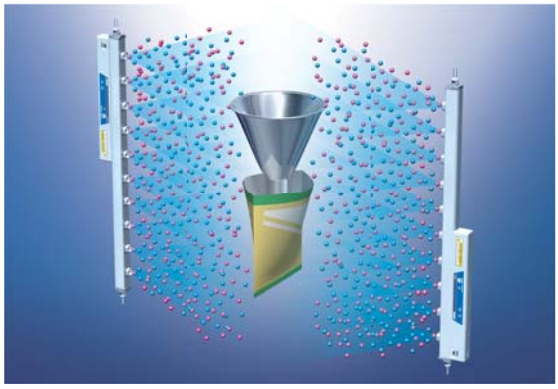
Eliminating static electricity during wafer transfer

· Prevents damage due to discharge between wafers and operators.



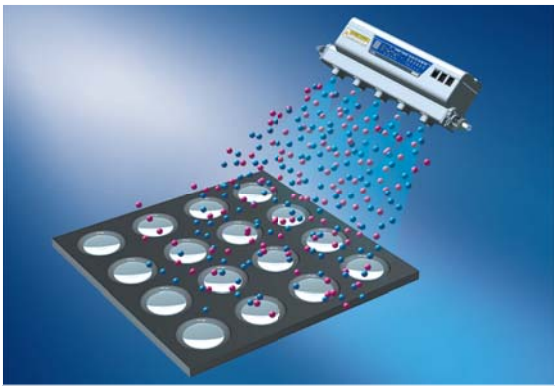
Eliminating static electricity from packing films

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



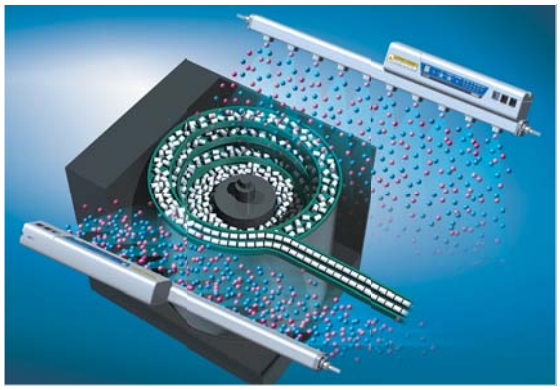
Eliminating static electricity from lens

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



Eliminating static electricity from parts feeder

· Prevents clogging of parts feeder.



Series IZS40/41/42
Technical Data

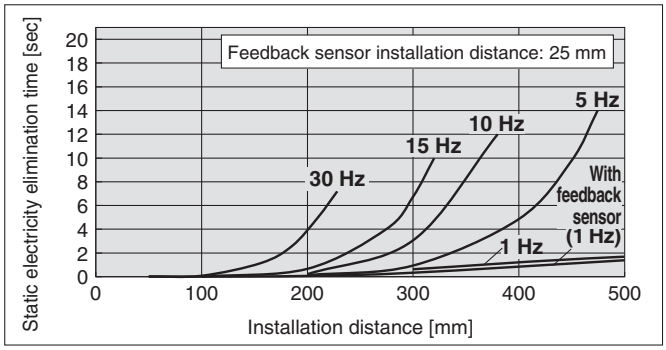
Static Electricity Elimination Characteristics

Note) Static electricity elimination characteristics are based on data using a 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 only as a guideline purpose only for model selection because the values vary depending on the material and/or size of objects.

① Installation Distance and Neutralization Time (Electricity Elimination from 1000 V to 100 V)

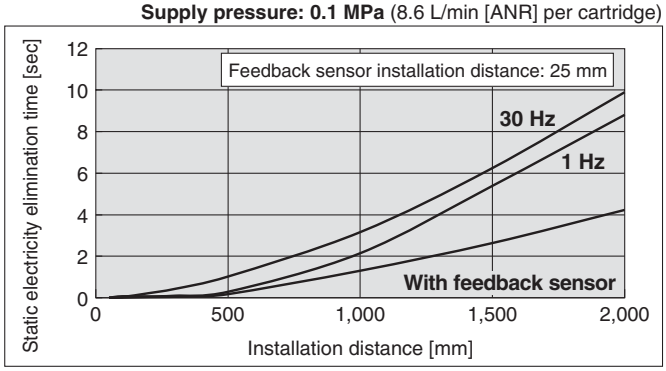
IZS40, 41

1) Without air purge

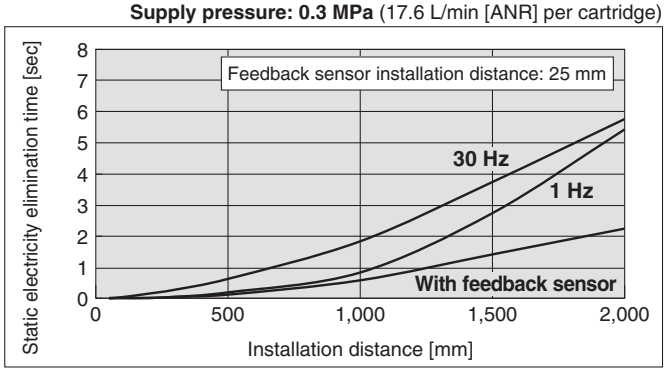


2) With high speed electrode cartridge, with air purge

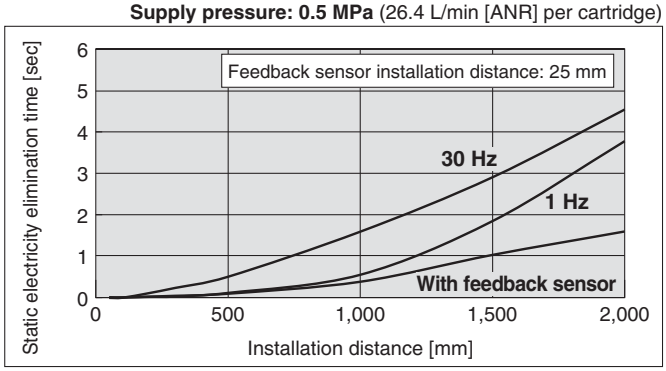
Supply pressure: 0.1 MPa (8.6 L/min [ANR] per cartridge)



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

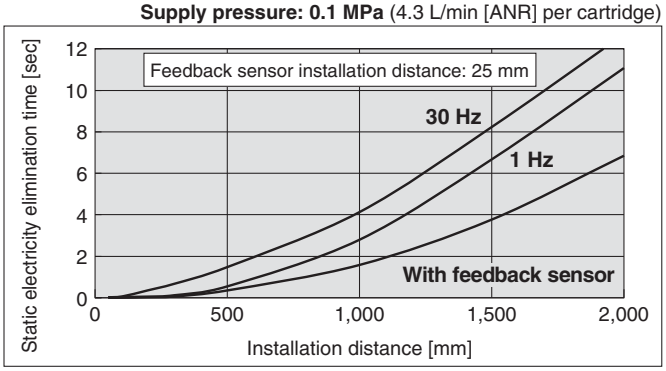


Supply pressure: 0.5 MPa (26.4 L/min [ANR] per cartridge)

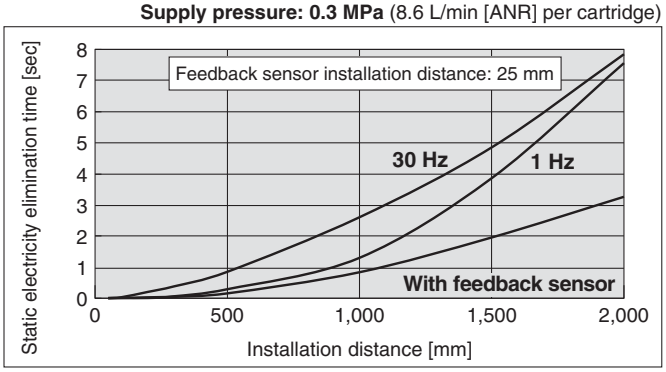


3) With energy saving type electrode cartridge, with air purge

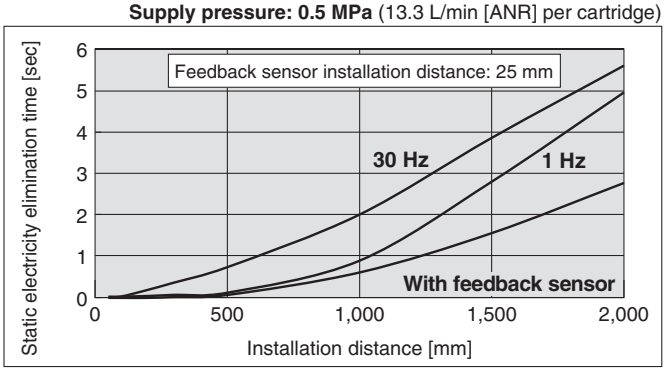
Supply pressure: 0.1 MPa (4.3 L/min [ANR] per cartridge)



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

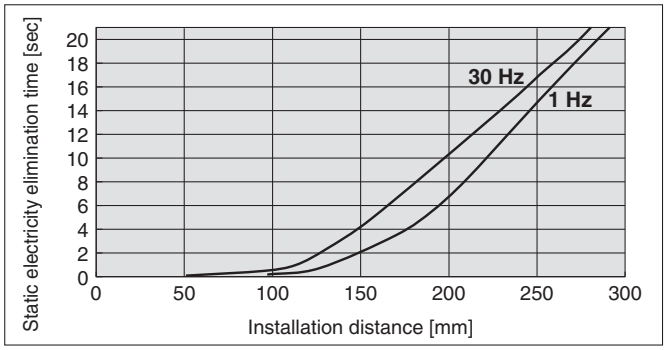


Supply pressure: 0.5 MPa (13.3 L/min [ANR] per cartridge)



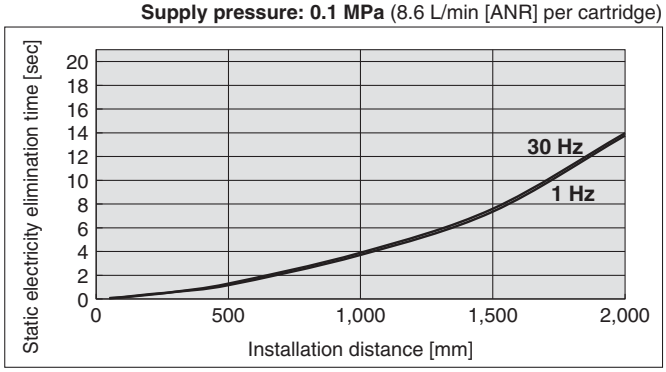
IZS42

1) Without air purge

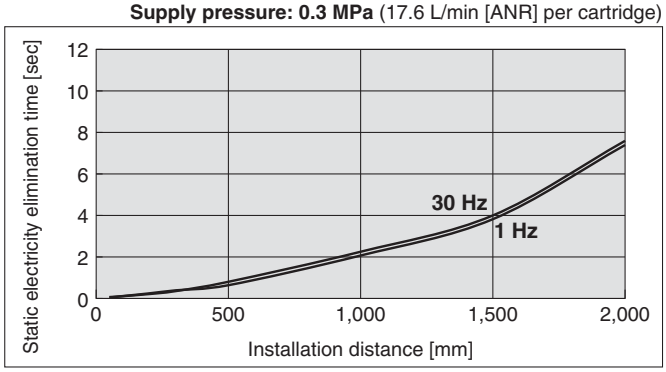


2) With high speed electrode cartridge, with air purge

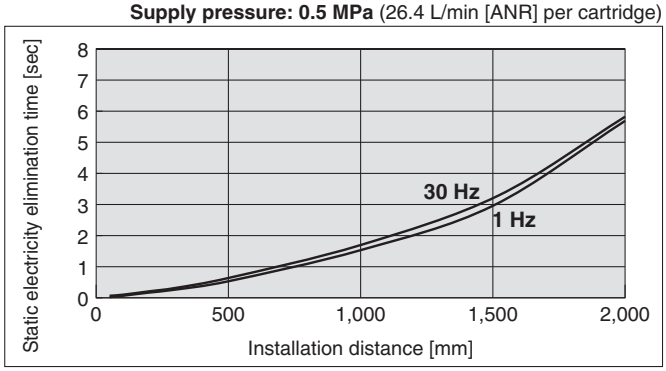
Supply pressure: 0.1 MPa (8.6 L/min [ANR] per cartridge)



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

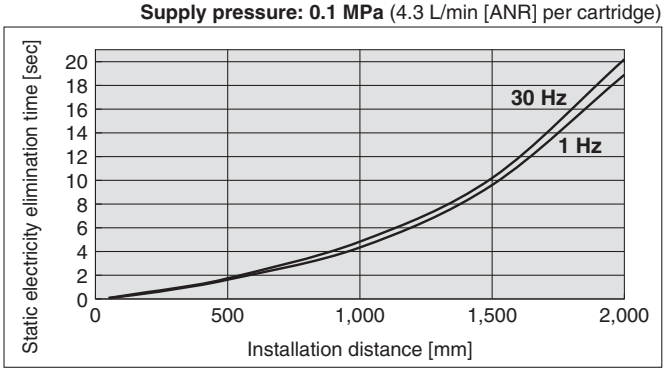


Supply pressure: 0.5 MPa (26.4 L/min [ANR] per cartridge)

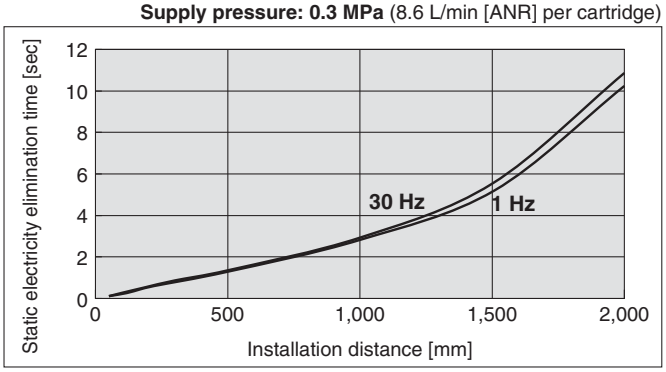


3) With energy saving type electrode cartridge, with air purge

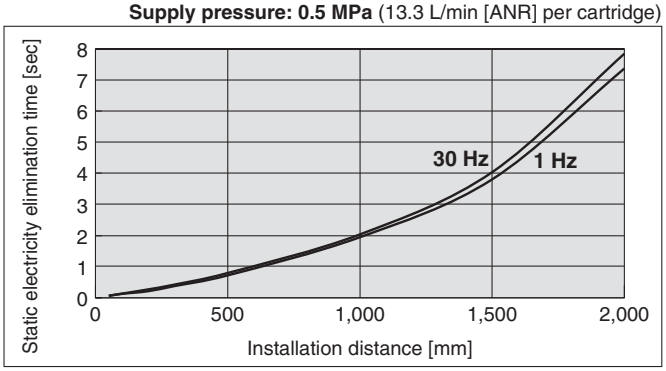
Supply pressure: 0.1 MPa (4.3 L/min [ANR] per cartridge)



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

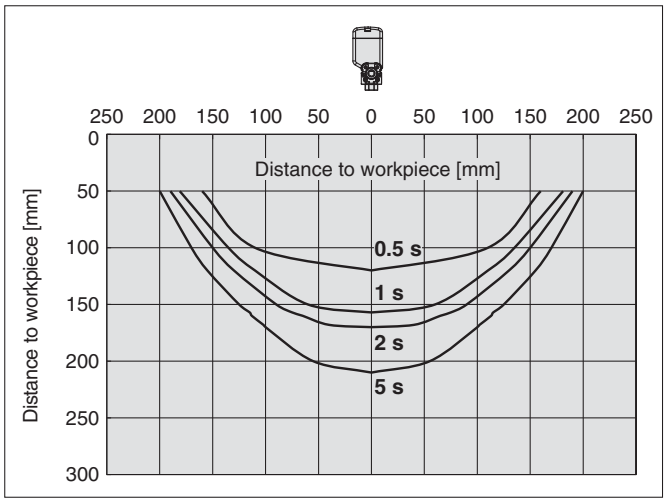
Note) Static electricity elimination characteristics are based on data using a charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use only as a guideline purpose only for model selection because the values vary depending on the material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

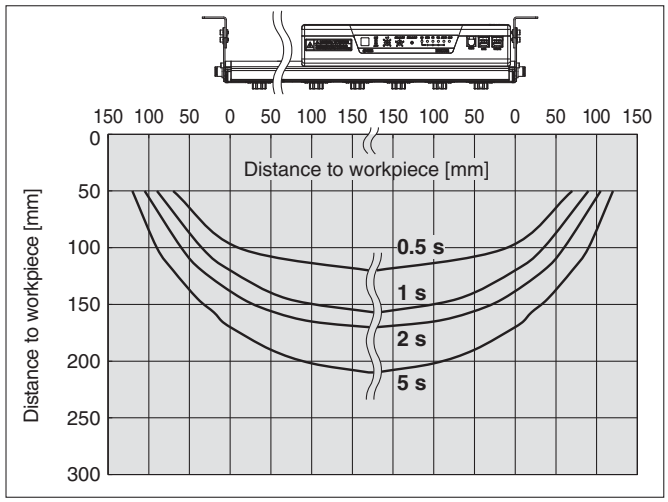
② Static Electricity Elimination Range

IZS40, 41

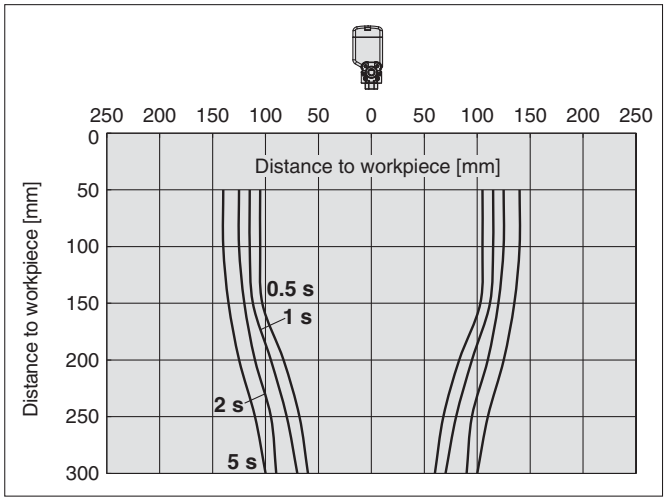
Frequency: 30 Hz

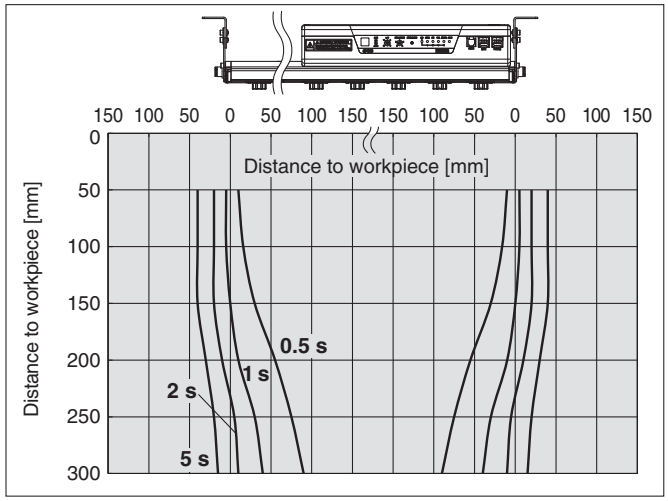
1) Supply pressure: 0 MPa



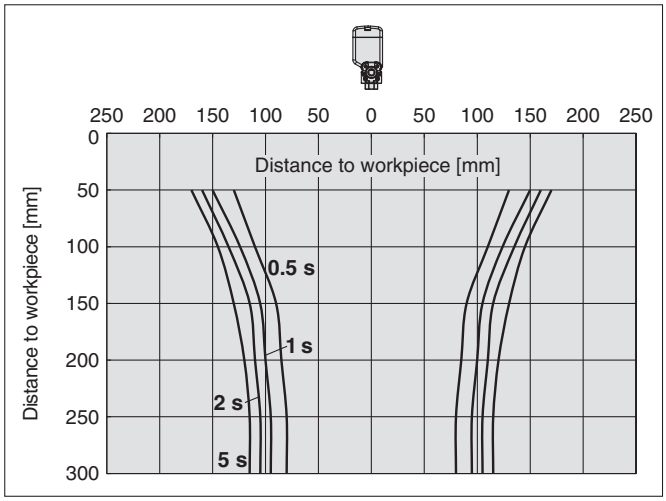


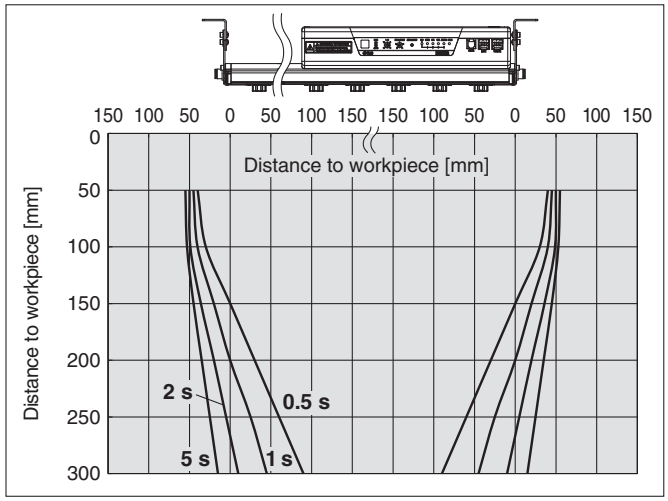
2) With high speed electrode cartridge, supply pressure: 0.3 MPa





3) With energy saving type electrode cartridge, supply pressure: 0.3 MPa

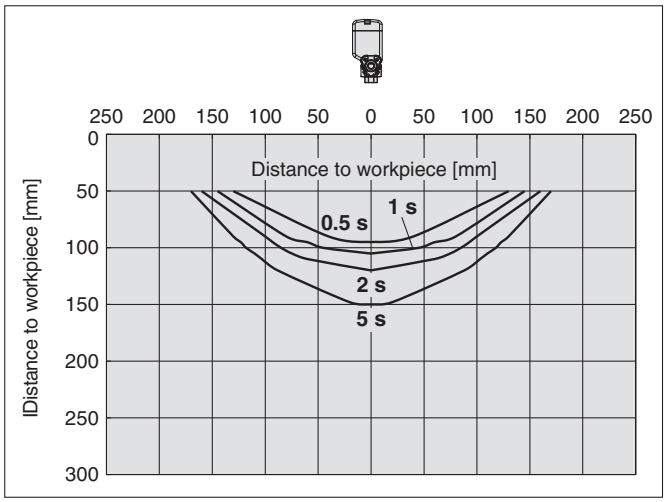


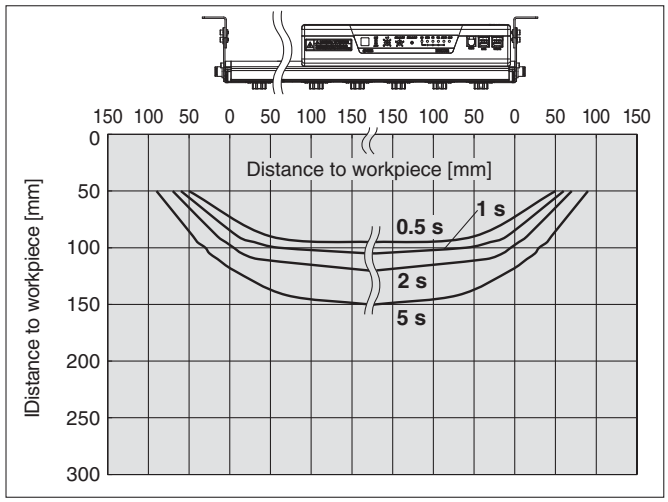


IZS42

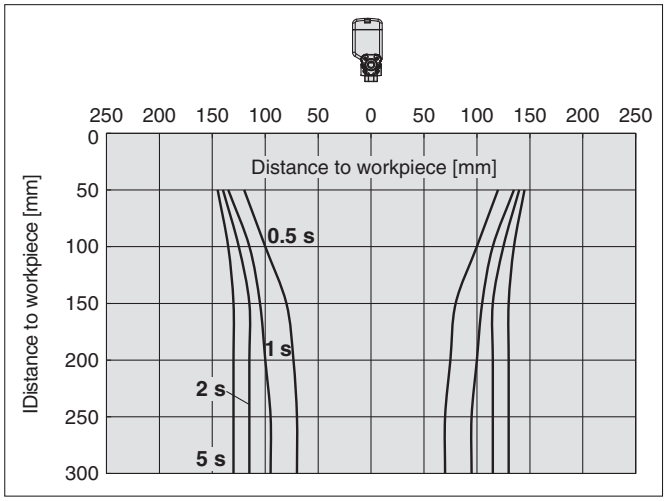
Frequency: 30 Hz

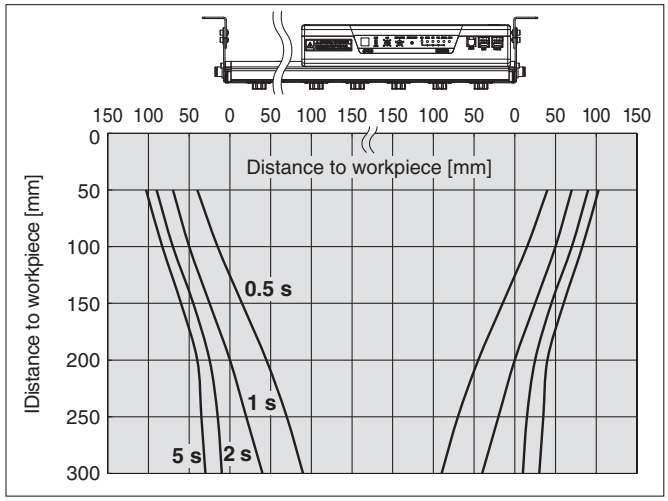
1) Supply pressure: 0 MPa



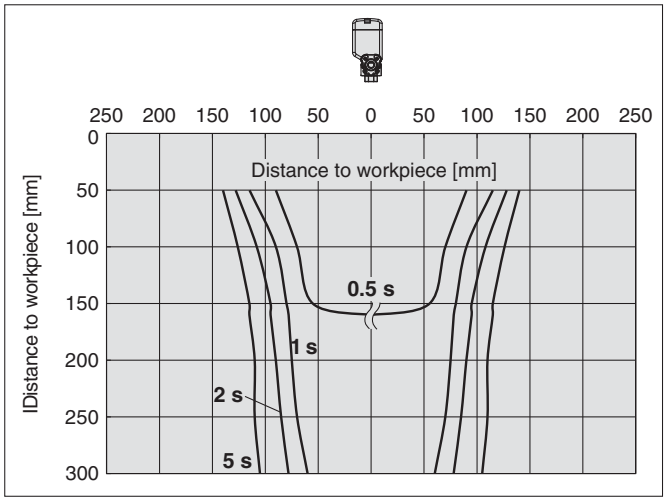


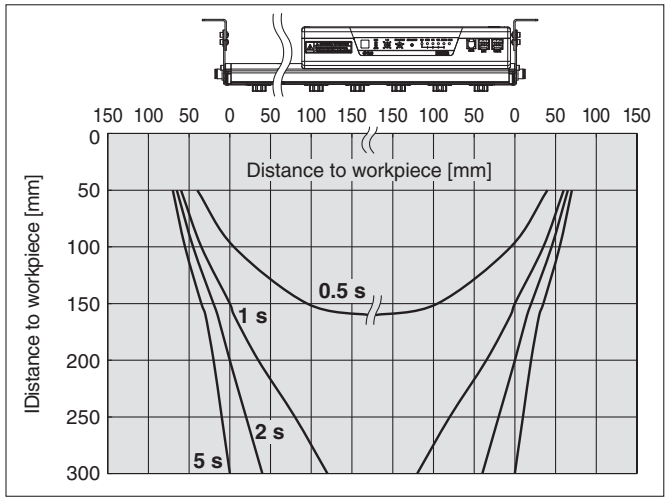
2) With high speed electrode cartridge, supply pressure: 0.3 MPa





3) With energy saving type electrode cartridge, supply pressure: 0.3 MPa





Static Electricity Elimination Characteristics

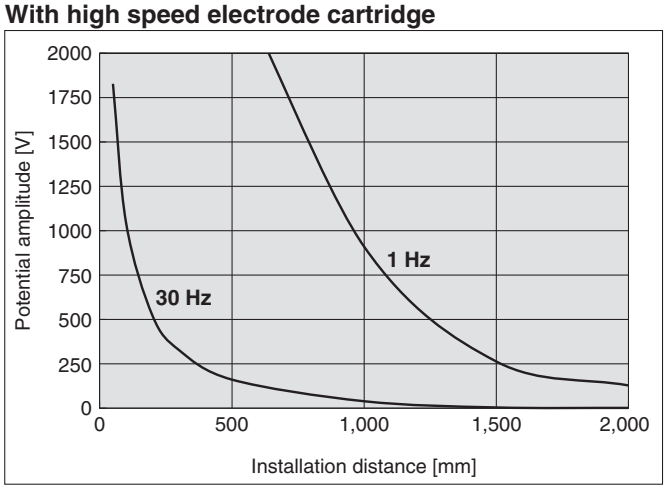
Note) Static electricity elimination characteristics are based on data using a charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use only as a guideline purpose only for model selection because the values vary depending on the material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

③ Potential Amplitude

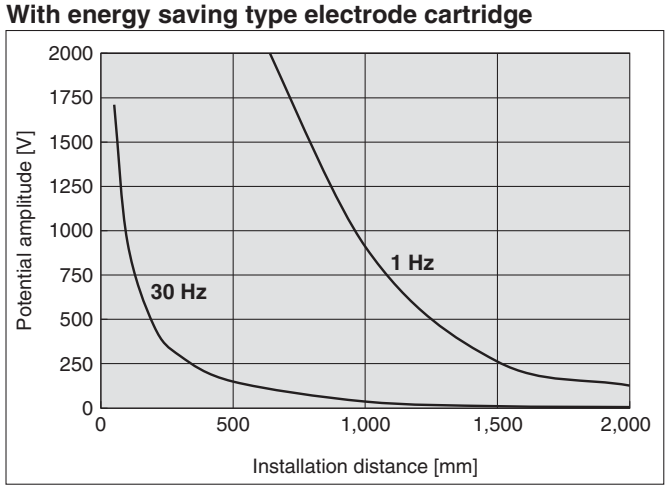
IZS40, 41

Supply pressure: 0.3 MPa, frequency: 30 Hz

With high speed electrode cartridge



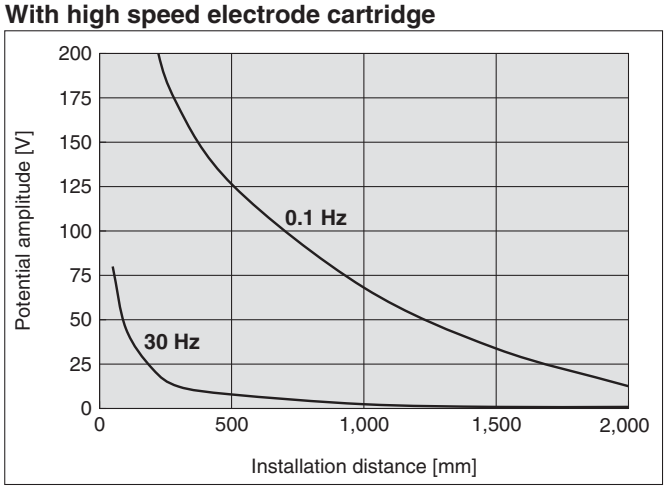
With energy saving type electrode cartridge



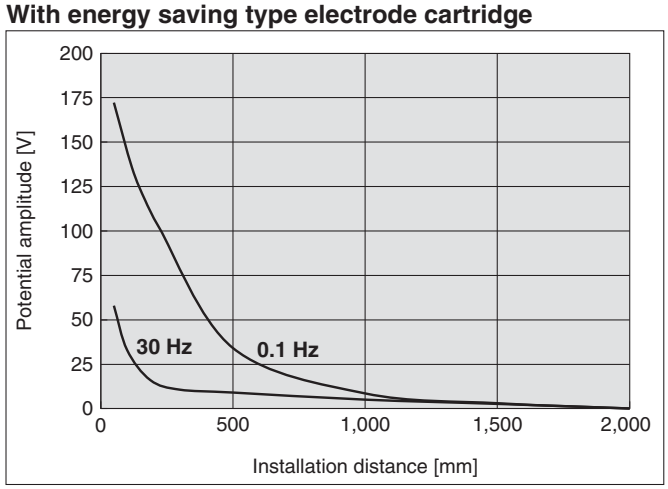
IZS42

Supply pressure: 0.3 MPa, frequency: 30 Hz

With high speed electrode cartridge

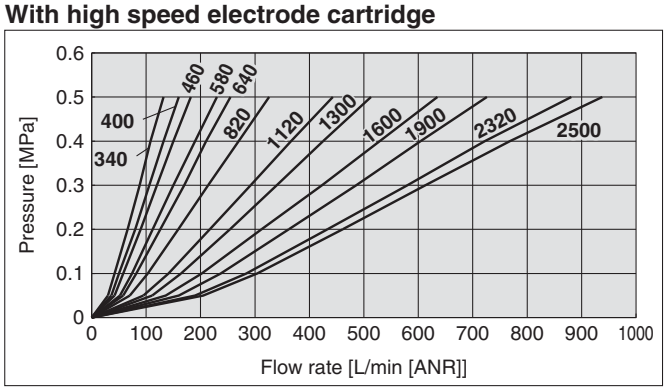


With energy saving type electrode cartridge

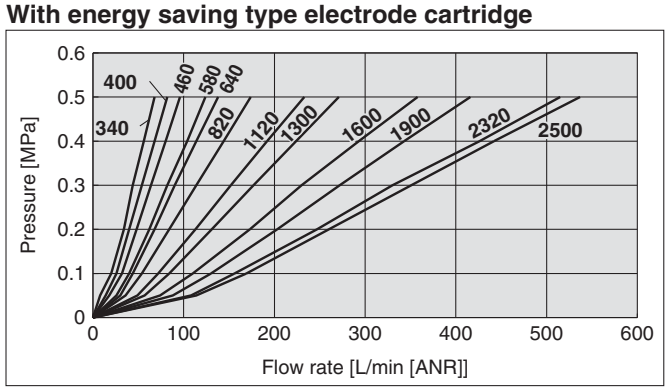


④ Flow Rate — Pressure Characteristics

With high speed electrode cartridge

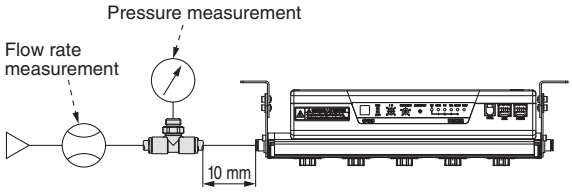


With energy saving type electrode cartridge

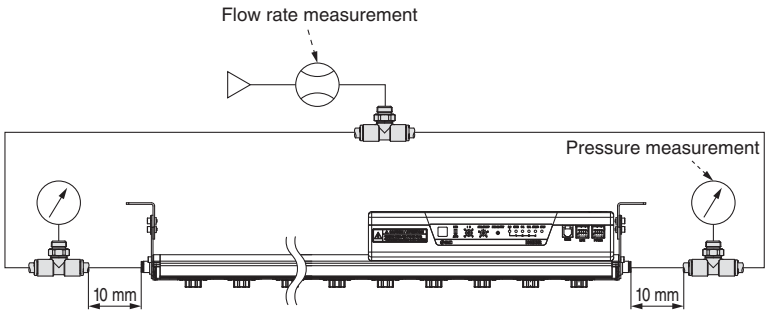


How to measure

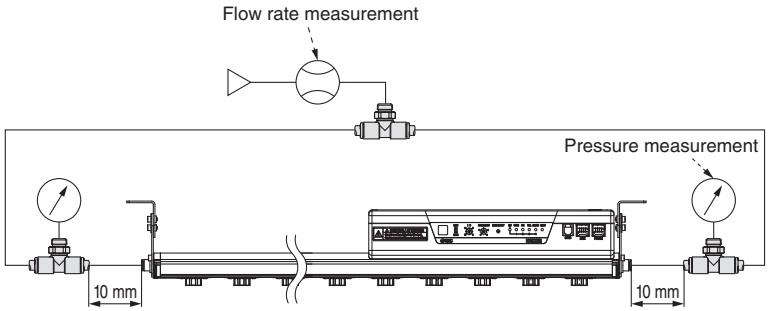
a) Single side air supply (Connecting tube: O.D. ø6 x I.D. ø4) (IZS4□-340, 400, 460, 580, 640)



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

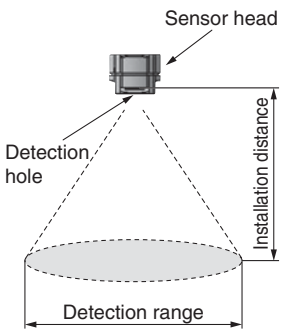


c) Double sided air supply (Connecting tube: O.D. ø8 x I.D. ø5) (IZS4□-1600, 1900, 2320, 2500)



Feedback Sensor Detection Range

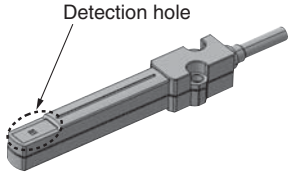
The relationship between the feedback sensor's installation distance and the detection range is as follows:



[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
–	Built-in sensor	●	●
F	Feedback sensor	●	–
G	Auto balance sensor [High accuracy type]	●	●

∗ Feedback sensor cannot be used with the IZS42.

Electrode cartridge type/Electrode material

Symbol	Electrode cartridge type	Electrode material
–	High speed cartridge	Tungsten
C		Silicon
J	Energy saving cartridge	Tungsten
K		Silicon

Bracket

–	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

–	NPN
P	PNP

∗ When using the AC adapter no input/output function is possible, so specify "–" for this option

Power supply cable

–	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 the connector (model: ZS-28-C) separately.
∗ To use the AC adapter, specify "N" and order separately (see page 10 for selection). The AC adapter comes with a cable.

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	Formula for calculating bar length: 460 + 60 x n (n: Integer from 1 to 34) For n = 2, 3, 6, 11, 14, 19, 24, 31 or 34 use the standard product.

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 electrode cartridge drop prevention cover(s) (the drop prevention cover(s) should be ordered separately).

Specifications

Ionizer model		IZS40	IZS41-□□ (NPN)	IZS41-□□P (PNP)	IZS42-□□ (NPN)	IZS42-□□P (PNP)
Ion generation method		Corona discharge type				
Electrode voltage type		AC, DC	AC, Sensing AC, DC		Dual AC	
Electrode 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 transition wiring		—	24 VDC to 26.4 VDC			
Input signal	**Discharge stop signal**	—	Connect to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less	Connect to +24 V Voltage range: 19 VDC to power supply voltage Current consumption: 5 mA or less	Connect to GND Voltage range: 5 VDC or less Current consumption: 5 mA or less	Connect 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 Voltage drop 1 V or less (at 100 mA load current) Max. applied voltage: 26.4 VDC	Max. load current: 100 mA Voltage drop 1 V or less (at 100 mA load current)	Max. load current: 100 mA Voltage drop 1 V or less (at 100 mA load current) Max. applied voltage: 26.4 VDC	Max. load current: 100 mA Voltage drop 1 V or less (at 100 mA load current)
	Error signal					
Function		High voltage error detection (Ion discharge stops if error found)	Ion balance control with the built-in sensor, electrode contamination detection, High voltage error detection (ion discharge stops if error found), ion discharge stop input, transition wiring, remote control (sold separately), external sensor connection			
Effective operating 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: Tungsten, Single crystal silicon				
Impact resistance		100 m/s²				
Standards/Directive		CE (EMC Directive: 2004/108/EC)				

Note) Conditions: installation distance = 300mm, air purge used

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

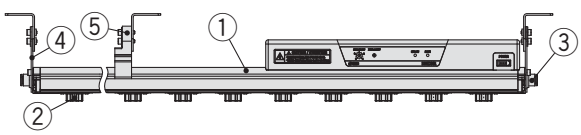
Remote controller (Sold separately)

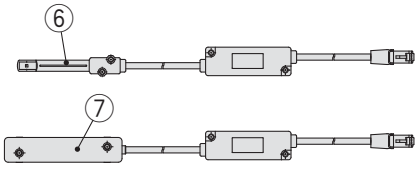
Model	**IZS41-RC**
Type	Infrared
Transmission capacity	5 m Note 1)
Power supply	2 AAA sized batteries (sold separately) Note 2)
Ambient temperature	0 to 45°C
Ambient humidity	35 to 80% Rh (with no condensation)
Weight	33 g (excluding dry cell batteries)
Standards/Directive	CE

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 control.

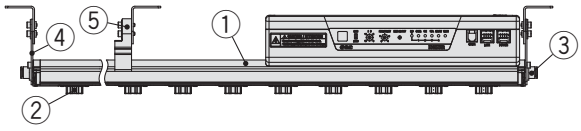
Construction

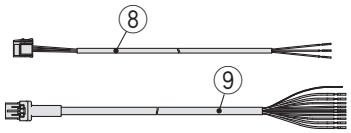
Series IZS40





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
⋮	⋮
09	9 m

Model with made-to-order power supply cable
Available in 1 m increments from 1 m to 9 m.
Note 1) Use standard power supply cables for 3 m and 10 m lengths.

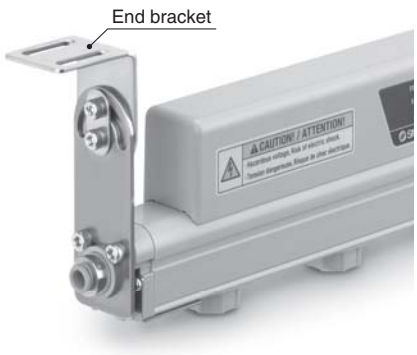
High speed electrode cartridge
- **IZS40-NT (Material: Tungsten)**
- **IZS40-NC (Material: Silicon)**

Energy saving electrode cartridge
- **IZS40-NJ (Material: Tungsten)**
- **IZS40-NK (Material: Silicon)**

Tungsten
(Cartridge colour: White)

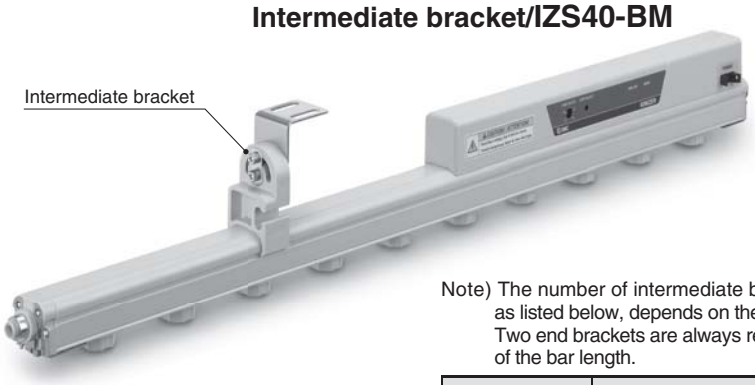
Silicon
(Cartridge colour: Grey)

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	2 pcs.	None
820 to 1600		1 pc.
1660 to 2380		2 pcs.
2440 to 2500		3 pcs.

Note) The model number is for a single bracket.

Sold Separately

Electrode cartridge drop prevention cover

IZS40-E 3

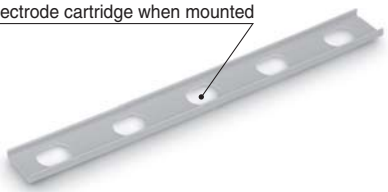
● **Number of fixed electrode cartridges**

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

Required number of drop prevention covers

Bar length symbol	Required number of 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

Location of electrode cartridge when mounted



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 control/IZS41-RC

AC adapter For IZS40

IZF10-C

● **AC adapter**

G2	AC adapter (without AC cable)
G2EU	Power supply cable with AC adapter (with AC cable)

∗ External input and output cannot be used when the AC adapter is being used.

For IZS40

For IZS41/42

IZS41-C

● **AC adapter**

G2	AC adapter (without AC cable)
G2EU	Power supply cable with AC adapter (with AC cable)

∗ 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
⋮	⋮
09	9 m

Model with Made-to-order transition wiring cable
Available in 1 m increments from 1 m to 9 m.
Note 1) Use standard power supply cables for 2 m, 5 m and 8 m lengths.
Note 2) Transition wiring is not possible for the IZS40.

Electrode cleaning kit/IZS30-M2

Wiring/IZS40

Wire cables in accordance with the wiring chart.

1. Grounding of F.G. cable

Ensure the F.G. cable (green) is grounded with a resistance less than 100 Ω.

The F.G. connection is used as the voltage reference point. If the F.G. terminal is not properly grounded, the ionizer will not achieve the optimal ion balance. Therefore, please connect to ground twith a resistance of less than 100 Ω.

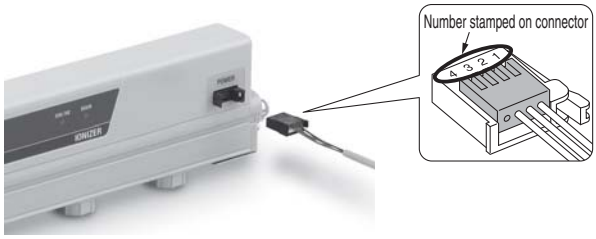
2. Connection circuit ("POWER" connector)

Wiring of the IZS40

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

The connector can be ordered complete with cable, or just the connector on its own.

When the e-con connector alone is required, order separately as an accessory.

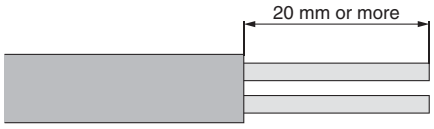


Wiring

Number stamped on connector	Description	Description
1	24 VDC	Power supply required to operate the ionizer.
2	GND	
3	F.G.	Ensure F.G. is grounded with less than 100 Ω for use as a voltage reference
4	—	Unused

How to connect the cable of the connector

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



Applicable wire

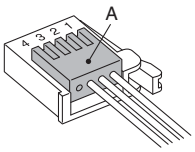
AWG No.	Conductor cross section [mm²]	Finish O.D. [mm]	Connector model
26-24	0.14-0.2	ø0.8-ø1.0	ZS-28-C

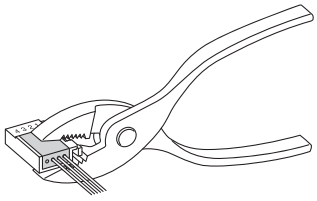
2) Insert the prepared cable into the appropriately numbered positions on the connector. Ensure the cable is inserted to the bottom of the connector.

3) Check that the above preparation has been performed correctly, then part A should be pressed in by hand to make a temporary connection.

4) Part A should then be pressed in using a suitable tool, such as pliers.

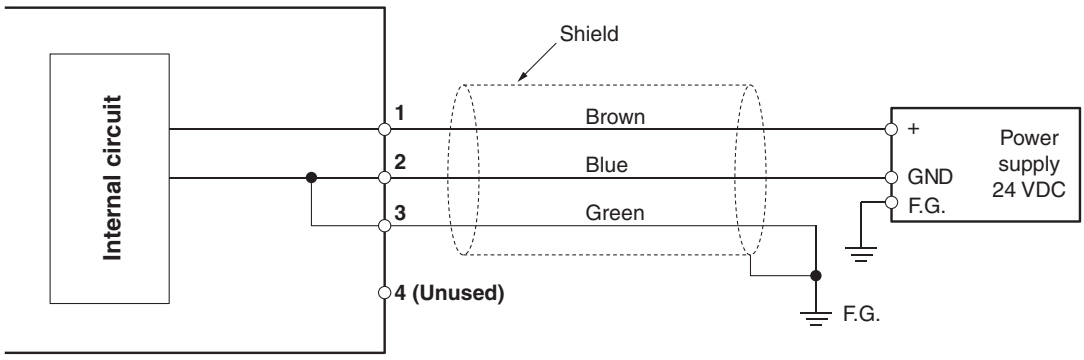
5) The e-con connector cannot be re-used once it has been fully crimped. In cases of connection failure such as incorrect order of wires or incomplete insertion, please use a new connector.





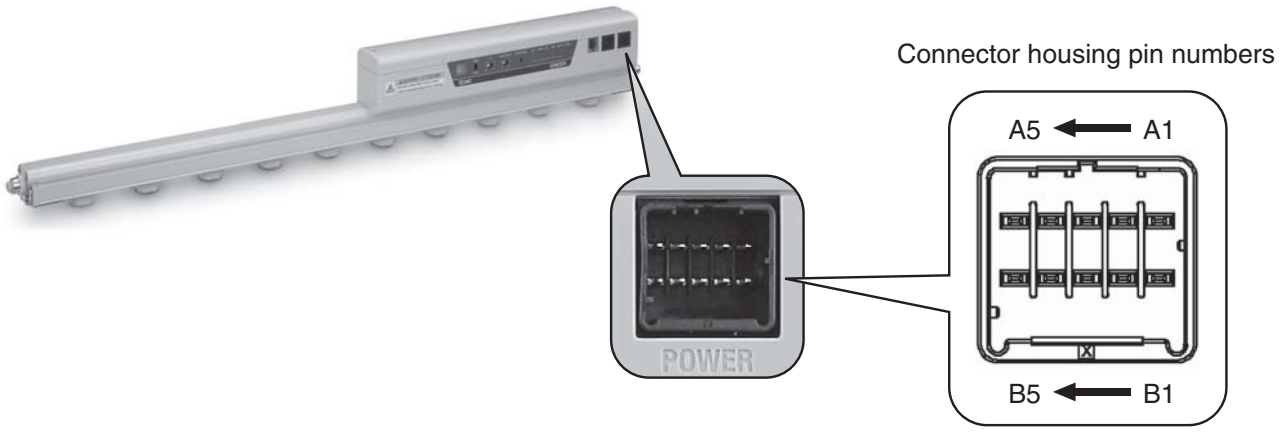
Connection Circuit/IZS40

Ionizer (IZS40)



If the cables are prepared by the user, the colours may differ from those shown in the diagram above.

Wiring/IZS41, 42

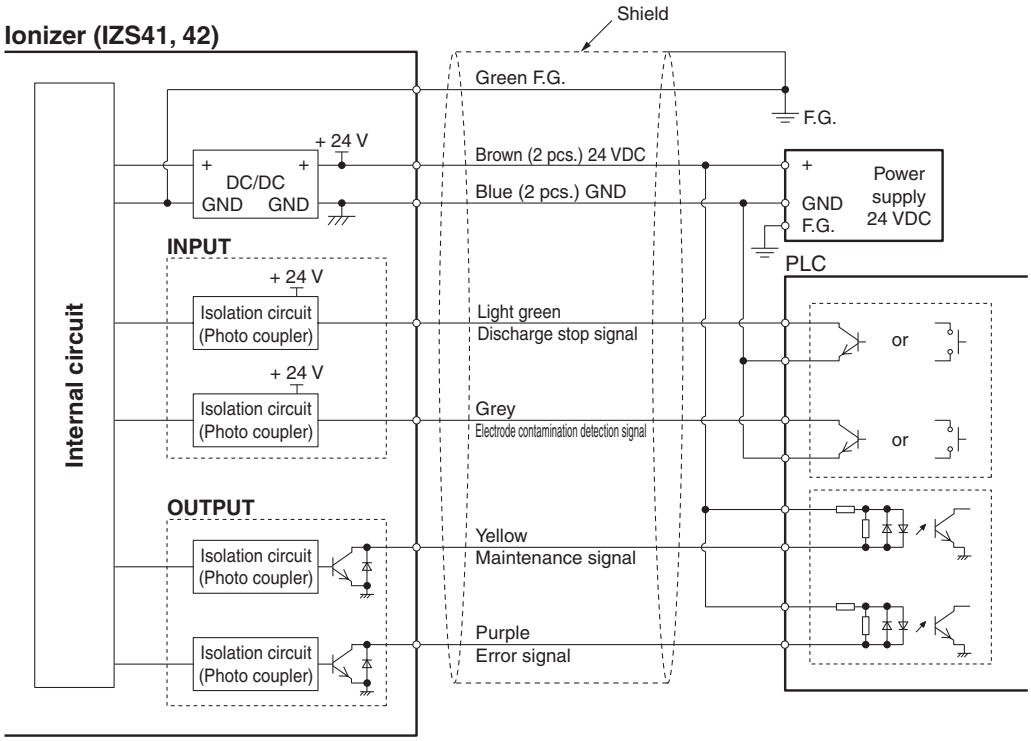


Wiring

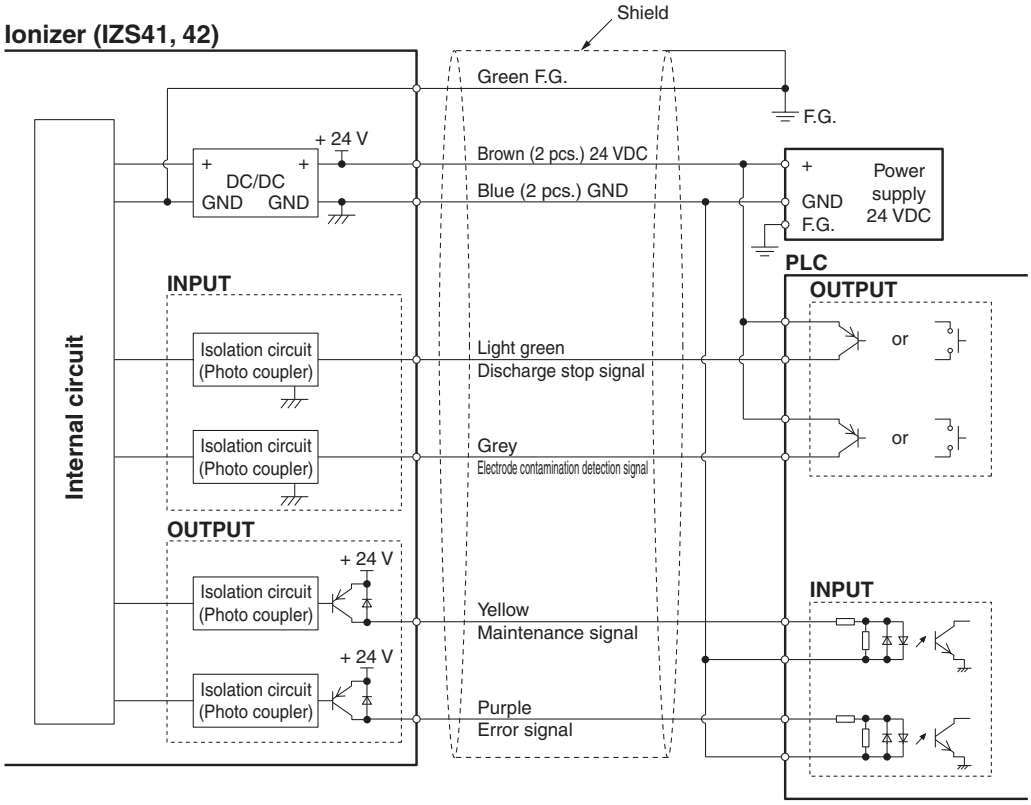
Pin no.	Cable colour	Description	Signal direction	Description
A1	Brown	24 VDC	IN	Power supply to operate the ionizer.
B1				
A2	Blue	GND	IN	
B2				
A3	Green	F.G.	—	Ensure F.G. is grounded with less than 100 Ω for use as a voltage reference.
B3	Light green	Discharge stop signal	IN	Signal input to turn 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	Grey	Electrode contamination detection signal	IN	Signal input to start the function that determines if electrode maintenance is necessary.
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 operation is normal.)
B5	White	Unused	—	

Wiring Circuit/IZS41, 42

NPN specification

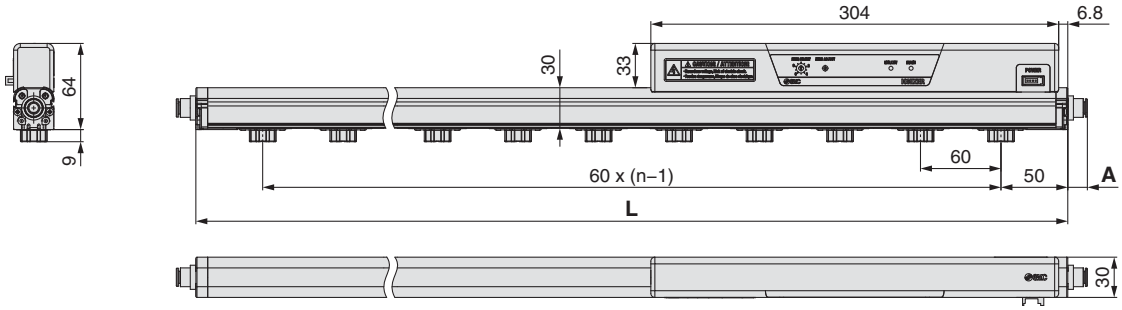


PNP specification



Dimensions

Ionizer/IZS40

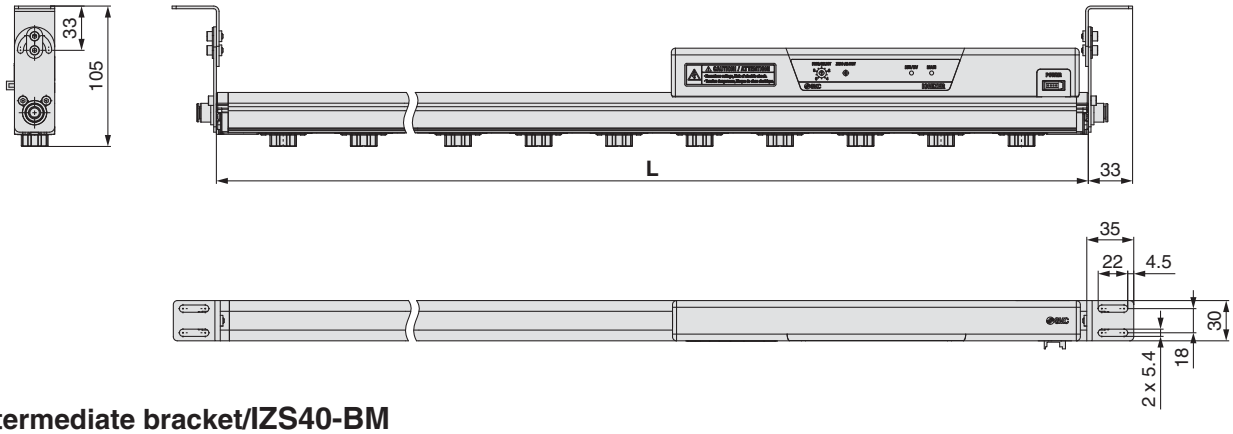


Applicable tube O.D.	A
06	13
08	15
10	22

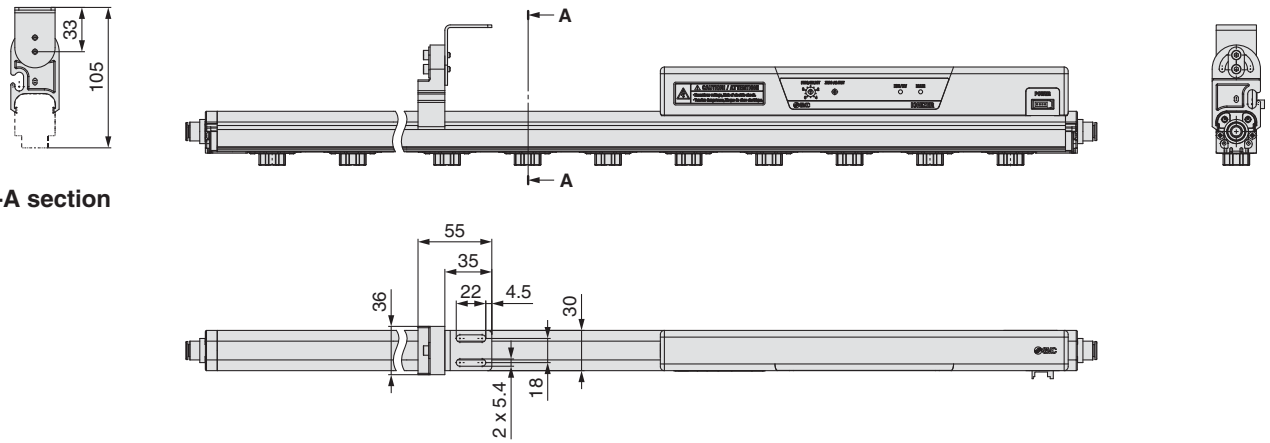
n (Number of electrode cartridges), L Dimension

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



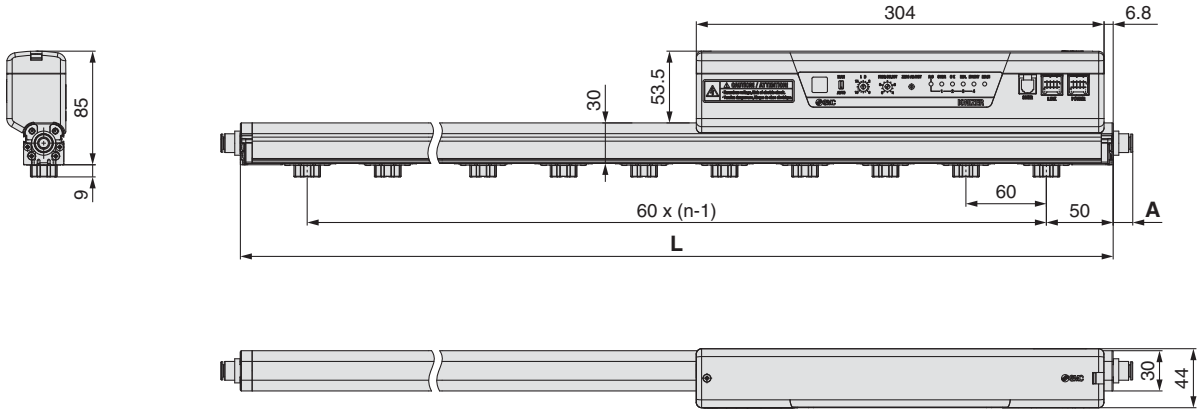
Intermediate bracket/IZS40-BM



A-A section

Dimensions

Ionizer/IZS41, 42

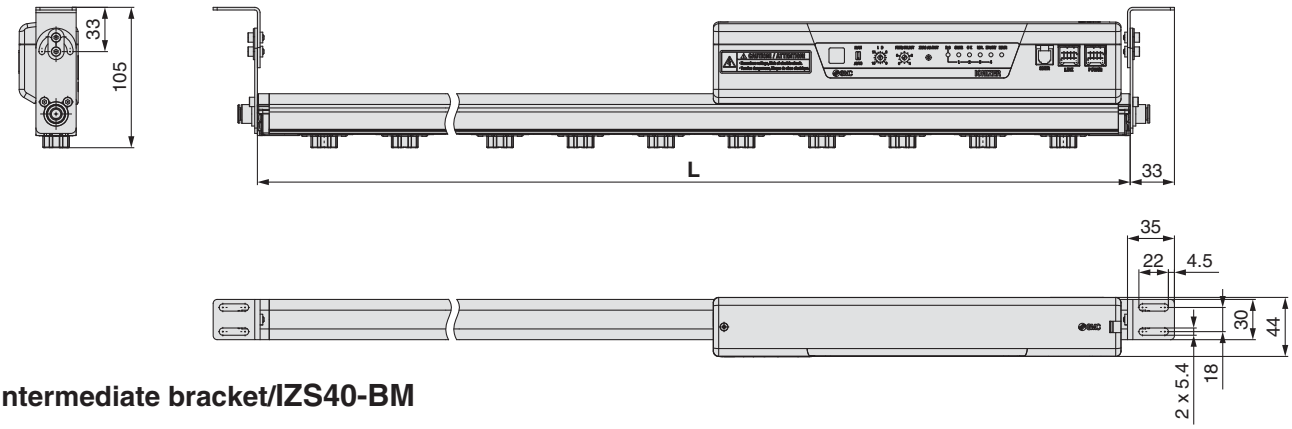


Applicable tube O.D.	A
06	13
08	15
10	22

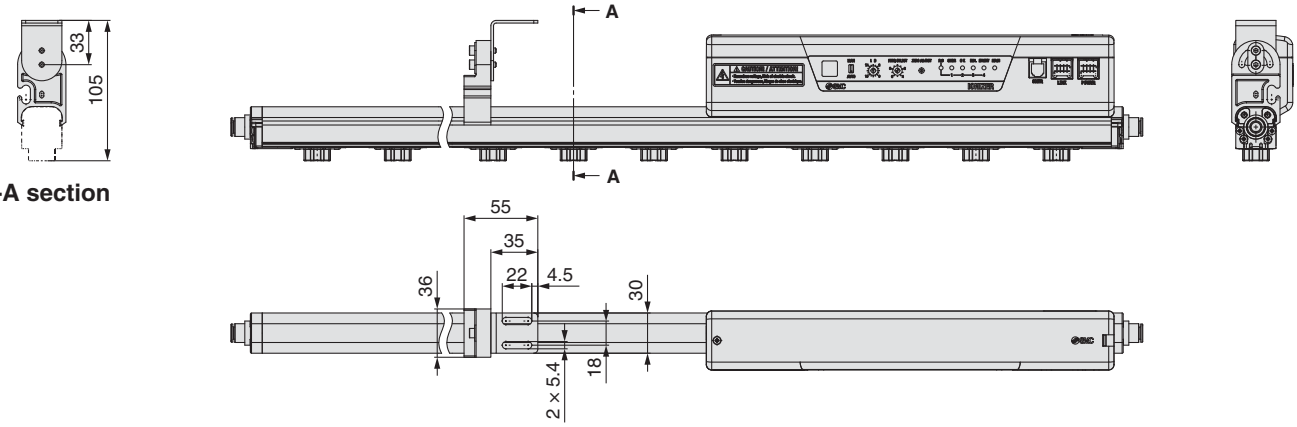
n (Number of electrode cartridges), L Dimension

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



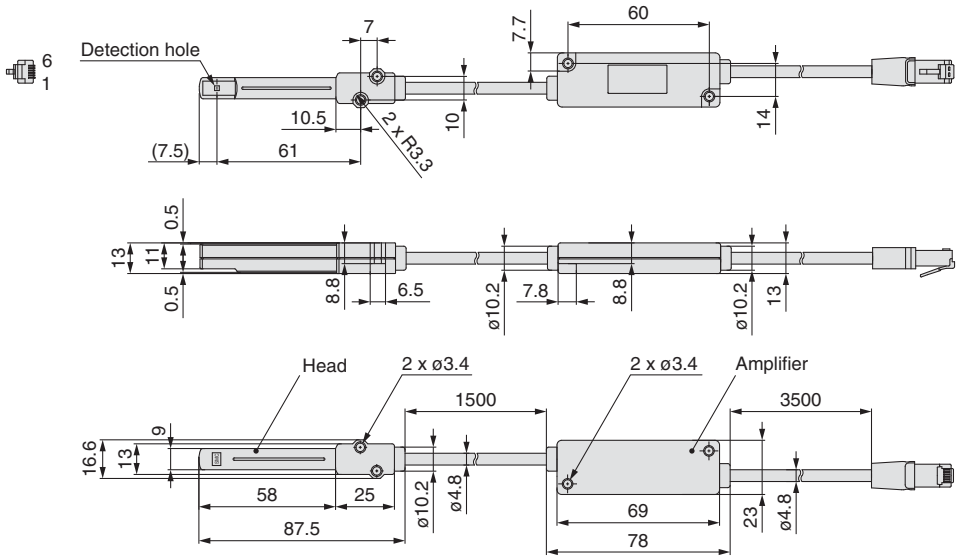
Intermediate bracket/IZS40-BM



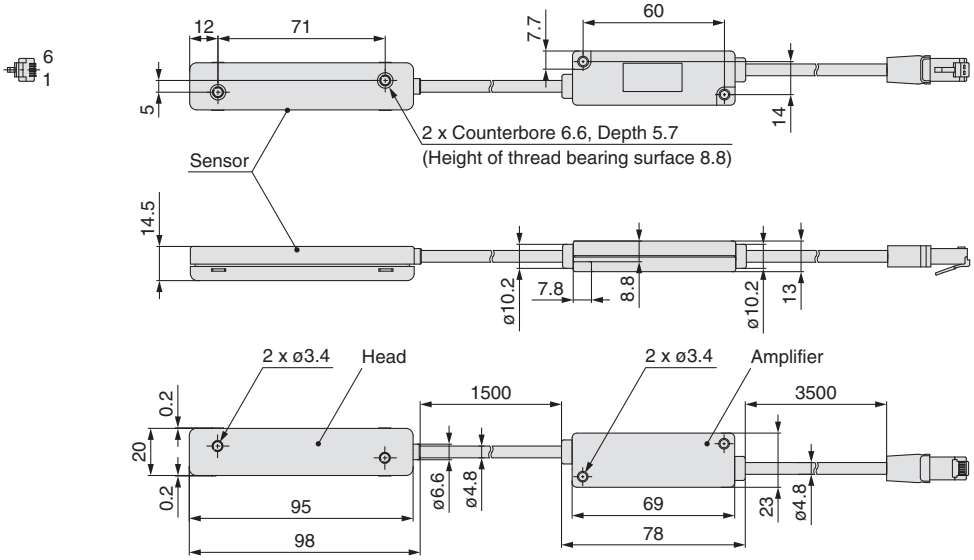
A-A section

Dimensions

Feedback sensor/IZS31-DF

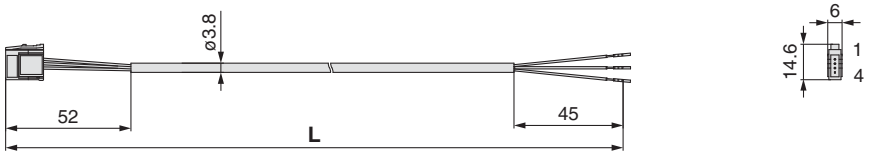


Auto balance sensor [High accuracy type]/IZS31-DG

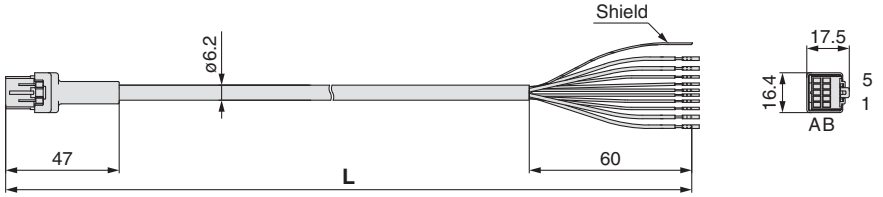


Power supply cable

IZS40-CP□



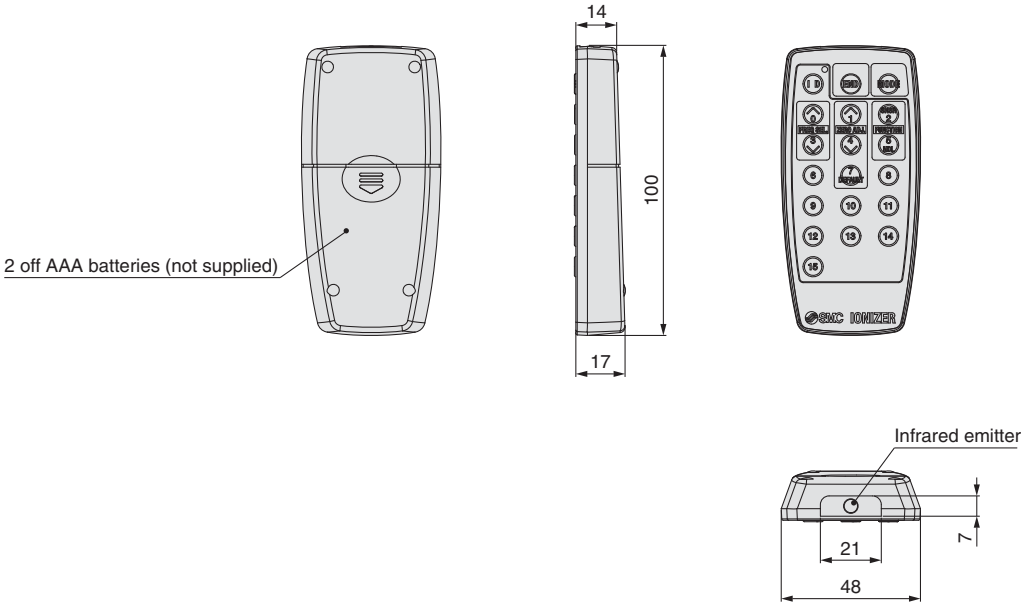
IZS41-CP□



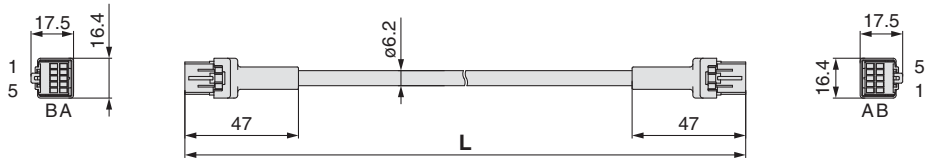
Part no.	**L** [mm]
IZS40-CP	3000
IZS41-CP	
IZS40-CPZ	9800
IZS41-CPZ	

Dimensions

Remote control



Transition wiring cable/IZS41-CF□



Part no.	**L** [mm]
IZF41-CF02	2000
IZF41-CF05	5000
IZF41-CF08	8000

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.

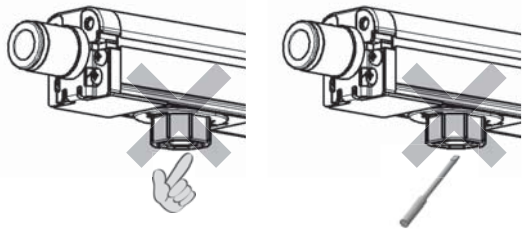
Refer to the operation manual for details.

6. Do not touch the electrode 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 or cartridge is damaged with a tool, the specification will not be met and damage and/or an accident may occur.

⚠Danger High Voltage

Electrodes 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 into the electrode cartridge or touching the electrode.



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

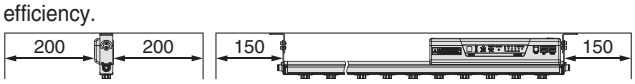
If the tape or seal contains any conductive adhesive or reflective paint, a dielectric phenomenon may occur due to ions arising from such substances, resulting in electrostatic charging or electric leakage.

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

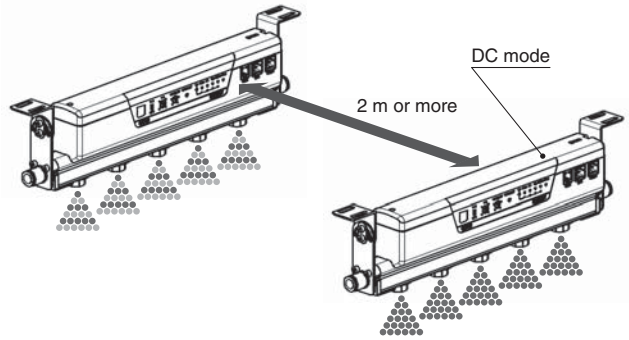
2. After installation, be sure to verify the effects of static electricity elimination.

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 an ionizer in DC mode, keep clearance of at least 2 m between them.

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



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				6 units																
1300												6 units								
1600			7 units																	
1900											7 units									
2320																			3 units	
2500																				

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

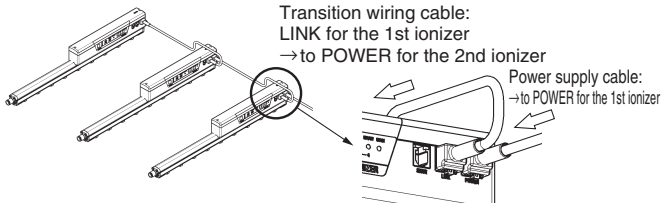
Bar length symbol	Power supply cable length: 3 m										Power supply cable length: 10 m									
	Transition wiring cable length (same cable length) m										Transition wiring cable length (same cable length) m									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
340																				
400																				
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.

An AC adapter must not be used for ionizers with 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) 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 lightning surge.

Maintenance

⚠Warning

1. Periodically inspect the ionizer and clean the electrodes.

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 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.

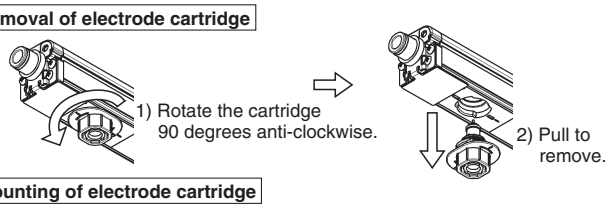
Maintenance

⚠Warning

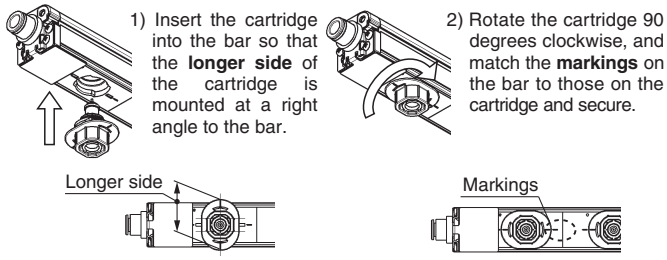
2. When cleaning the electrode or replacing the electrode cartridge, be sure to turn off the power supply or air supply to the body.

Touching an electrode 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.

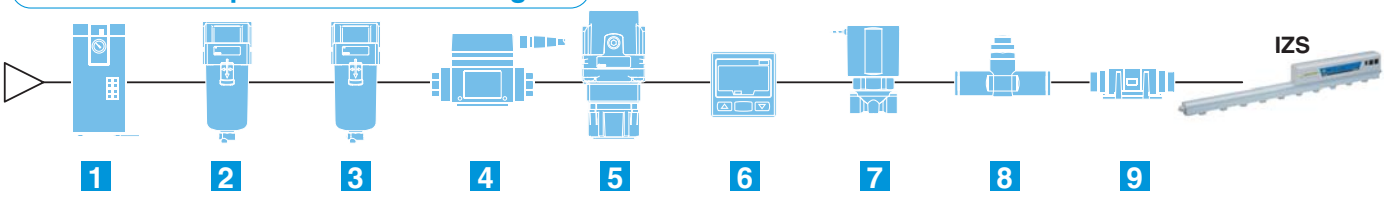
If the modular plug is at a difficult angle to attach/detach, the jack's mounting section may be damaged and cause a disorder.

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

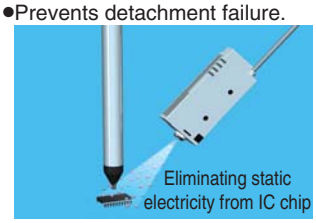
Ionizer/Nozzle type *Series IZN10*

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: Only 16 mm thick

❶ Electrode contamination detector

Continuous monitoring of electrode wear and contamination, with maintenance output signal.

Detects optimal maintenance time, reduced labor for maintenance.

❷ Built-in power supply

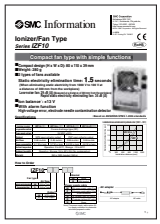
No need for high voltage power supply and cabling.

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 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 an analogue 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 + Analogue 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

⚠ 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 catalogue 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 catalogue.
   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, wichever 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 catalogue 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.

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1st printing RS printing RS 00 Printed in Spain