Static Electricity Elimination Equipment

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Ionizer/Bar Type
IZS40/41/42

P.32

Ionizer/Nozzle Type
IZN10

P.55

Ionizer/Fan Type
IZF10

P.58

Electrostatic Sensor
IZD10/IZE11

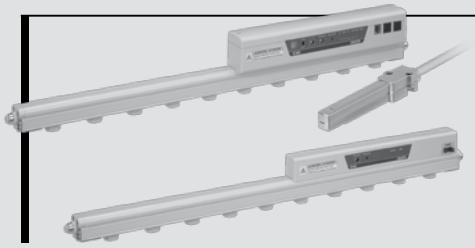
P.74

Handheld Electrostatic Meter
IZH10

SMC

CAT.NE103A

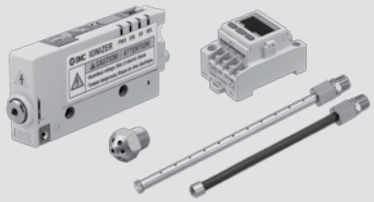
Static Electricity Elimination Equipment



Ionizer/Bar Type

Series IZS40/41/42

P.4



Ionizer/Nozzle Type

Series IZN10

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Ionizer/Fan Type

Series IZF10

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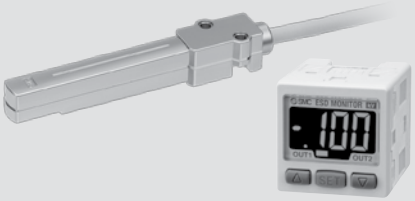

Electrostatic Sensor

Series IZD10/IZE11

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Handheld Electrostatic Meter

Series IZH10

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Ionizer

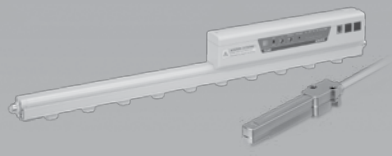
Series IZS40/41/42

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.

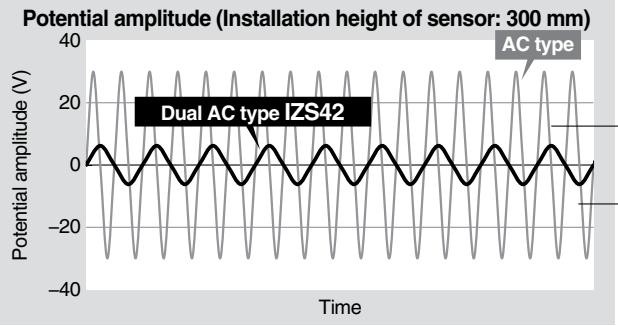
Note 1) IZS42, Installation height: 300 mm
Note 2) Conditions/With feedback sensor
Charged voltage: 1000 V→100 V
Discharged object: Charged plate (150 mm x 150 mm, capacitance 20 pF)
Installation distance: 200 mm (Tungsten electrode needle with air purge)

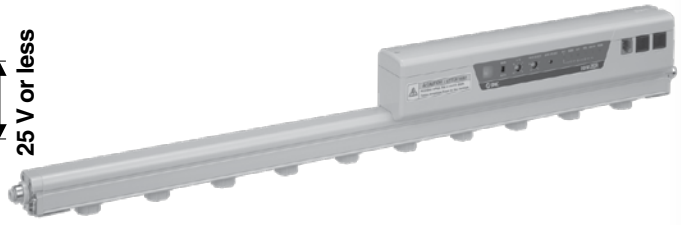
Dual AC type *Series IZS42* (Potential amplitude reduction specification)

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)

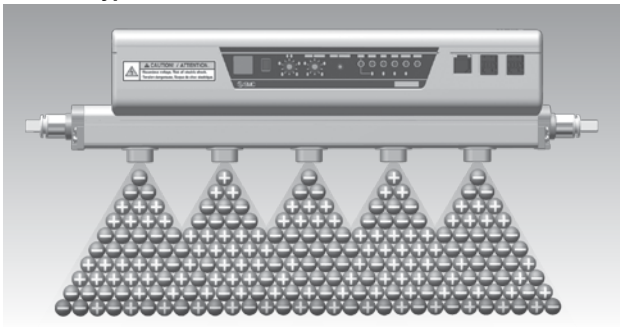
Potential amplitude is reduced with **SMC independent Dual AC type sensor**.
Static electricity elimination may be achieved without causing damage to a device which is sensitive to electrostatic discharge (ESD).
Potential amplitude applied to the applicable workpiece is reduced even if it the workpiece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





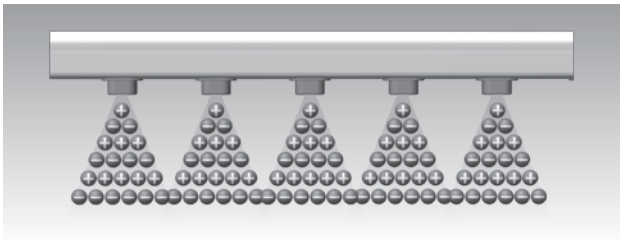
Independent Dual AC type is implemented.

Dual AC type/IZS42



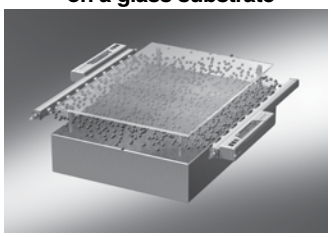
Discharges + ions and – ions at the same time to allow the + and – ions to reach the workpiece evenly, thereby reducing the potential amplitude.

AC type



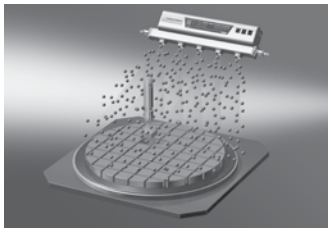
+ ion and – ion layers reach the workpiece within the same cycle, which increases the potential amplitude.

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.

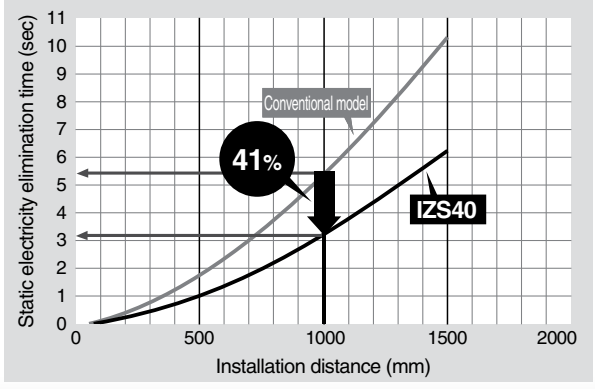
Standard type *Series IZS40*

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: 15 psi (0.1 MPa)
The IZS40 has a high speed static electricity elimination cartridge.

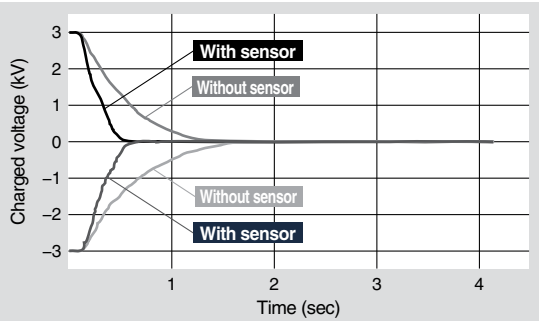


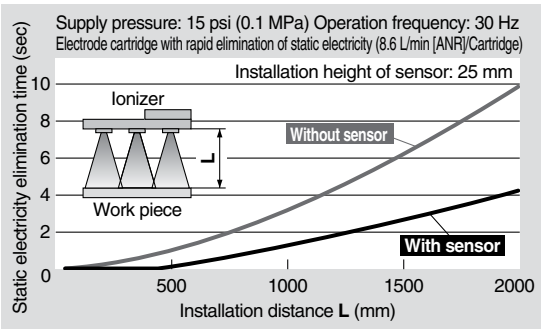
Feedback sensor type *Series IZS41* (High speed static electricity elimination specification)

Rapid elimination of static electricity by a feedback sensor

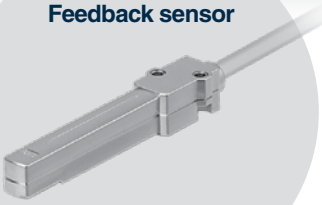
Note) An ion balance sensor is installed.

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.

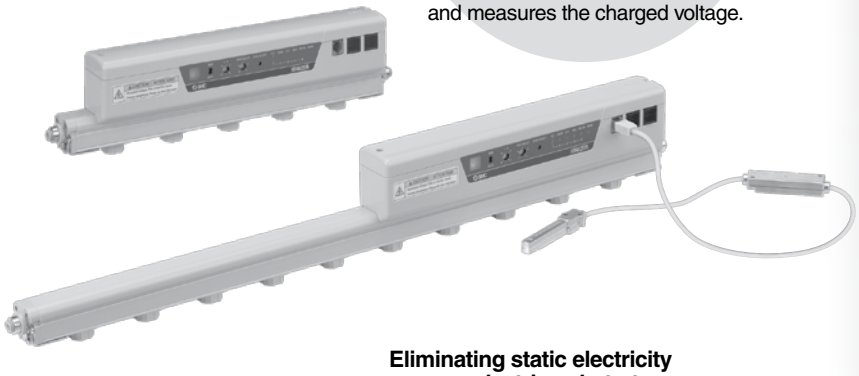




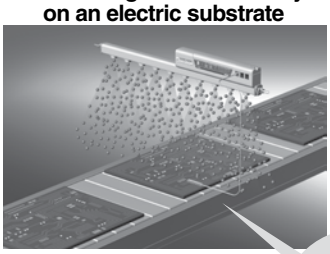
Feedback sensor



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

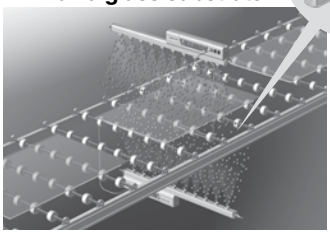


Eliminating static electricity on an electric substrate



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

Eliminating static electricity on a glass substrate



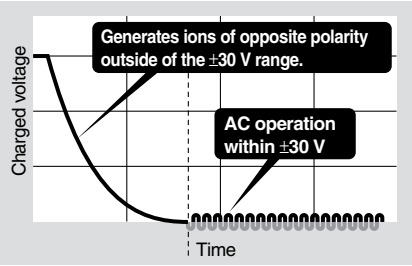
·Prevents breakage due to adhesion and discharge.
·Prevents adhesion of dust.

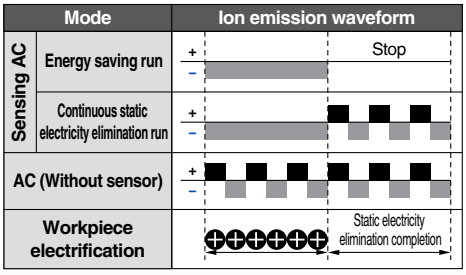
Run mode after static electricity elimination (ion balance: within ±30 V) can be selected.

■ **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.

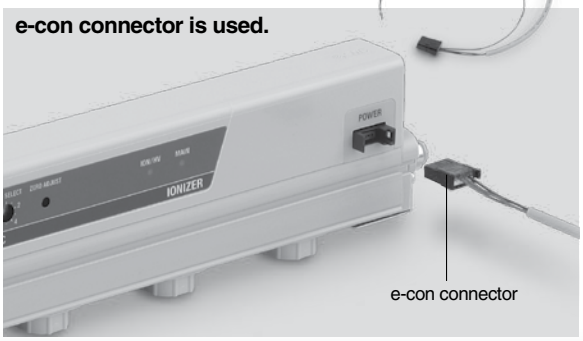
Continuous static electricity elimination run mode





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

e-con connector is used.

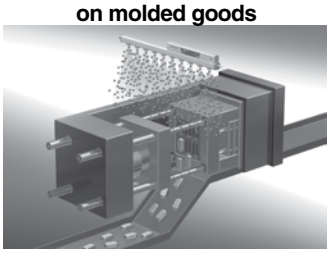


Suitable for static electricity elimination of resin and rubber pieces (small parts).

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

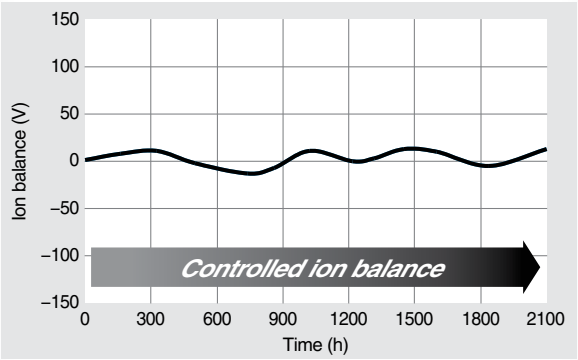
IZS 41 IZS 42

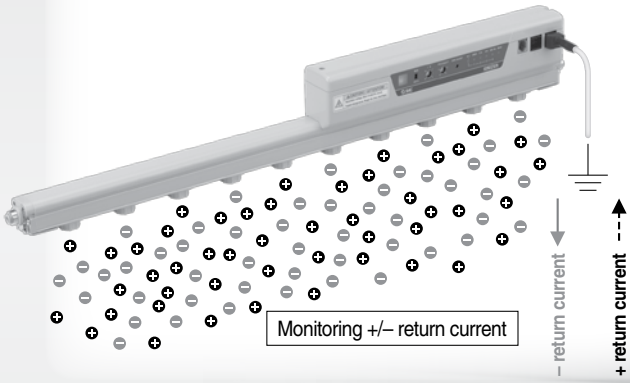
Built-in type (Standard)

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

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

Ion balance (image)



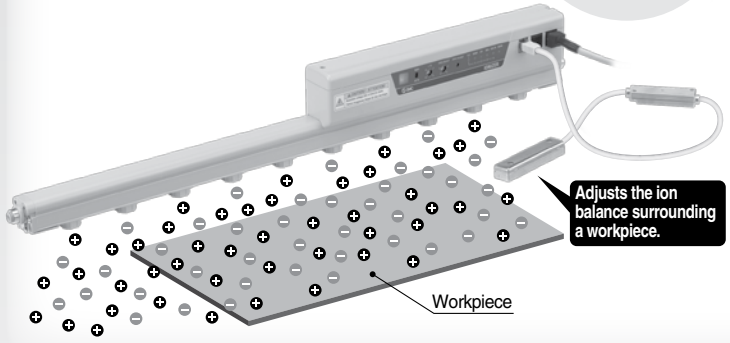


High accuracy type (Option)

- **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

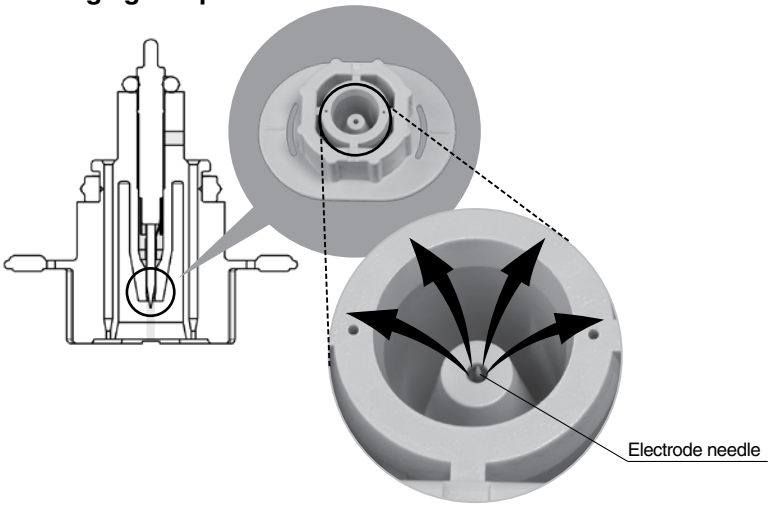
Measures the ion balance condition.



Low maintenance electrode cartridges are used.

IZS 40 IZS 41 IZS 42

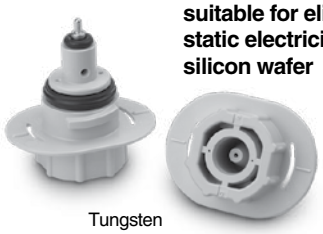
- **Minimizes contamination of electrode needles by discharging compressed air at the surface of the needles.**



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)

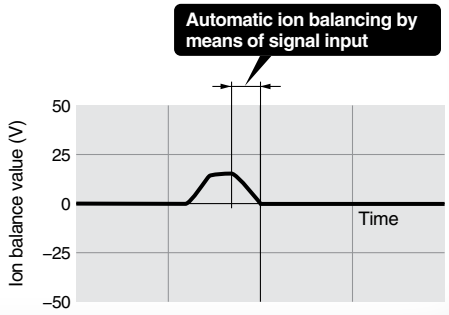
SMC

Refer to page 9 for Models and Functions.

Setting ionizer with remote controller IZS41 IZS42

- "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.

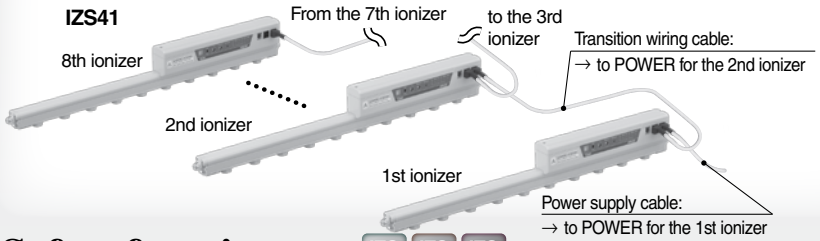


- **May be used to adjust and set several ionizers remotely.**
- **Can recognize and control up to 16 ionizers through address setting.**
- **Frequency setting**
- **Ion balance adjustment**
- **Electrode contamination detection alarm level can be adjusted (3 levels).**
- **Built-in sensor valid/invalid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

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

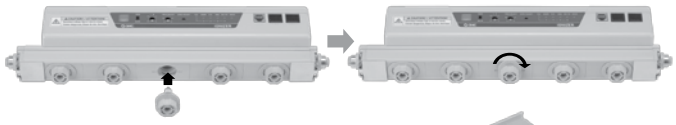
Reduces man hours required for connecting wires to the power supply.



Safety functions IZS40 IZS41 IZS42

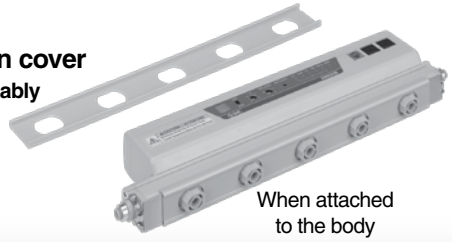
- **Electrode cartridge drop prevention function**

Locking by double-action



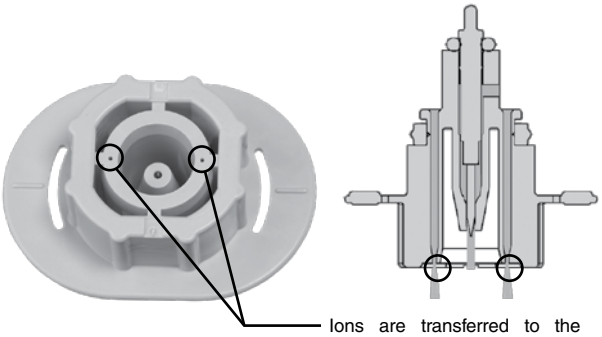
- **Drop prevention cover**

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

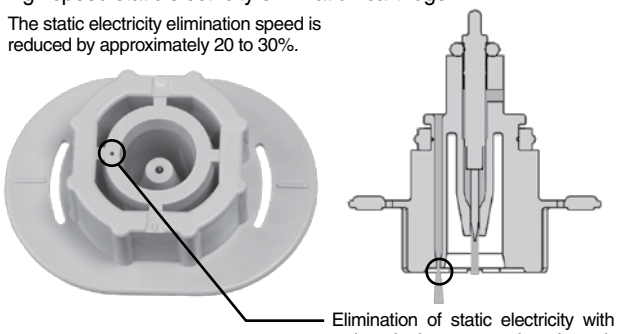


Ions are transferred to the workpieces efficiently by using two pneumatic nozzles to improve the static electricity elimination performance.

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.

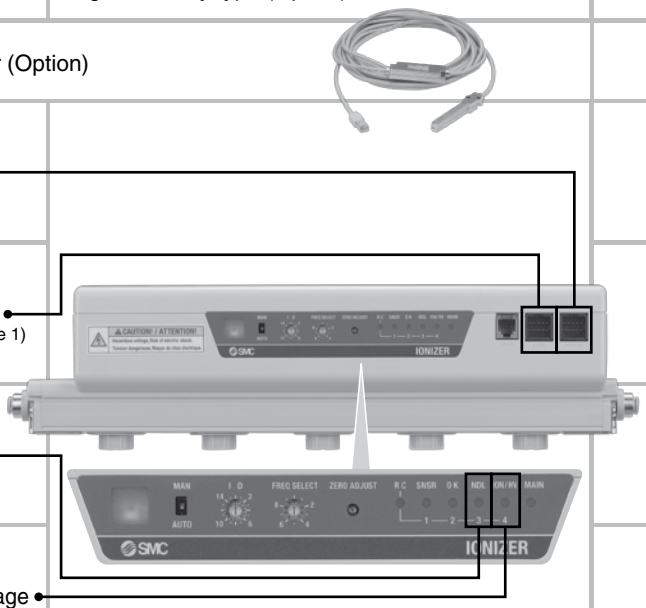
The static electricity elimination speed is reduced by approximately 20 to 30%.



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

Ionizer *Series IZS40/41/42*
Models and Functions

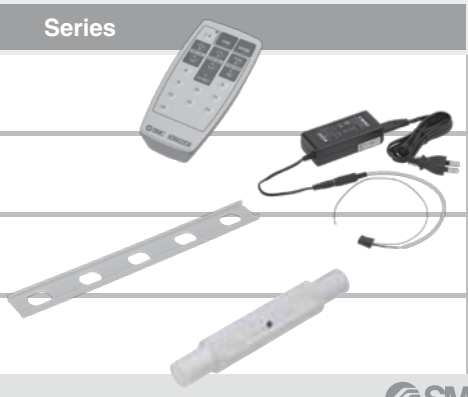
Series		IZS42	IZS41	IZS40
Method of applying voltage		Dual AC	AC, Sensing AC, DC	AC, DC
Sensor (Auto balance)	Built-in type (Standard)	●	●	—
	High accuracy type (Option)	●	●	
Feedback sensor (Option)		—	●	—
I/O		●	●	—
Transition wiring may be used. Note 1)		●	●	—
Electrode needle contamination detector		●	●	—
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.

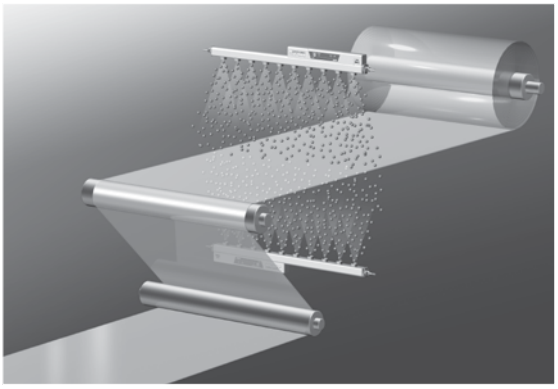
Accessories sold separately (per series)

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

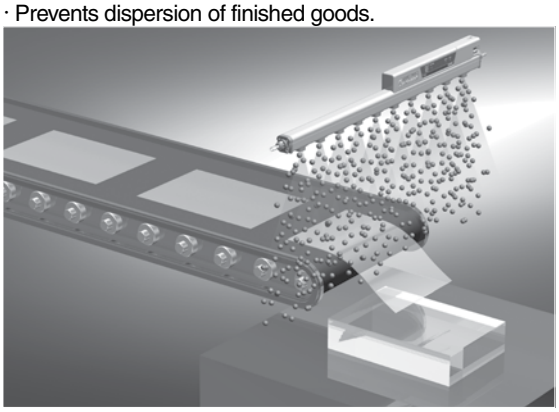


Application Examples

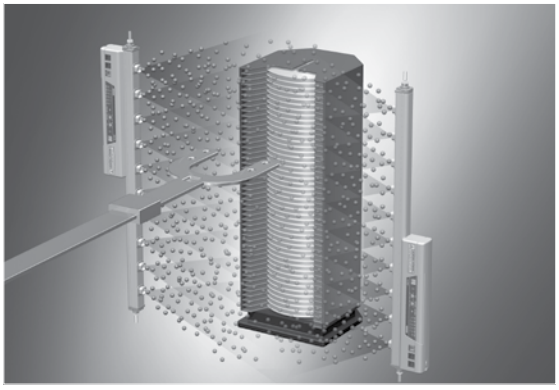
Eliminating static electricity from films
· Prevents adhesion of dust. · Prevents winding failure due to wrinkles etc.



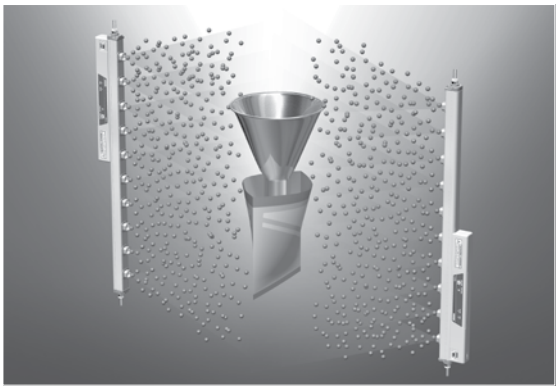
Eliminating static electricity on film molded goods
· Prevents attaching to conveyer.
· Prevents dispersion of finished goods.



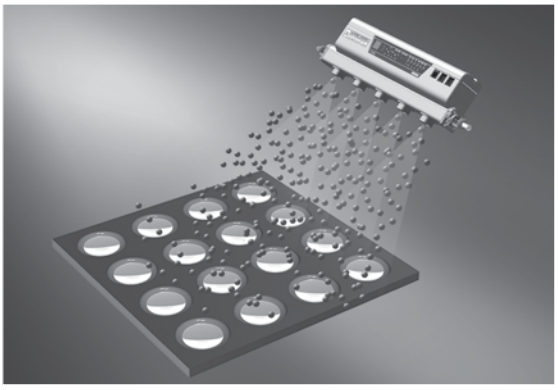
Eliminating static electricity during wafer transfer
· Prevents breakage due to discharge between wafers and hands.



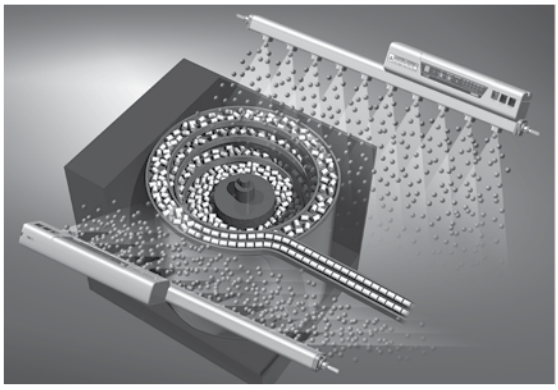
Eliminating static electricity from packing films
· Prevents the filled substance from adhering to the packing film.
· Reduces packing mistakes.



Eliminating static electricity from lens
· Removes dust from lens. · Prevents adhesion of dust.



Eliminating static electricity from parts feeder
· Prevents clogging of parts feeder.



Technical Data

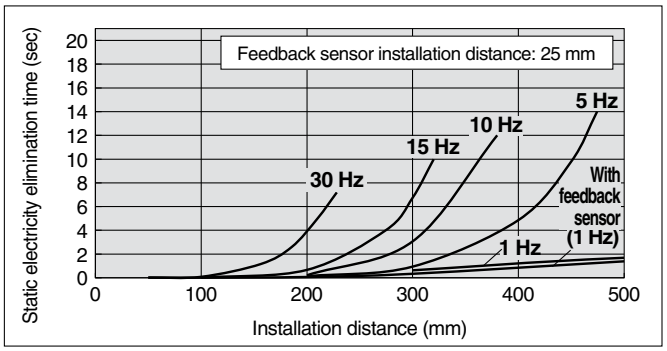
Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material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

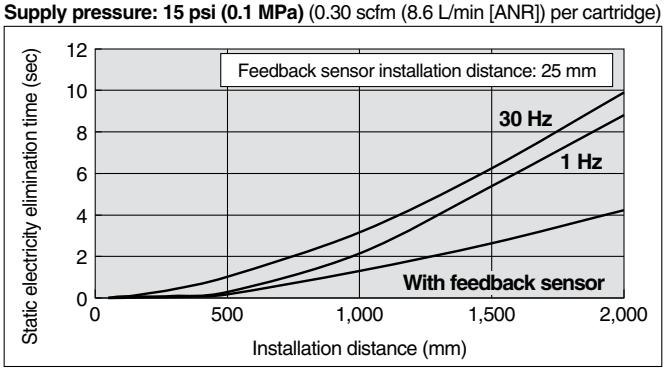
IZS40, 41

1) Without air purge

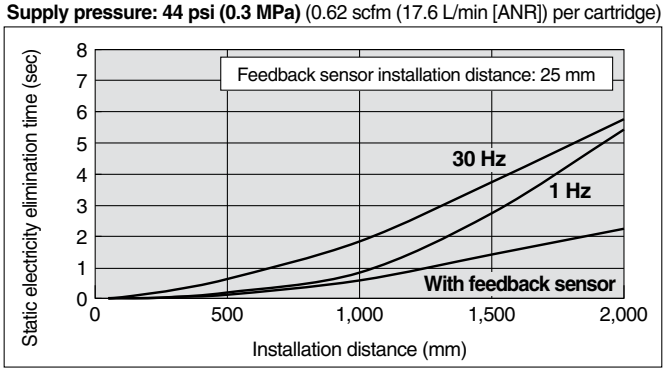


2) With high speed de-ionizing cartridge, With air purge

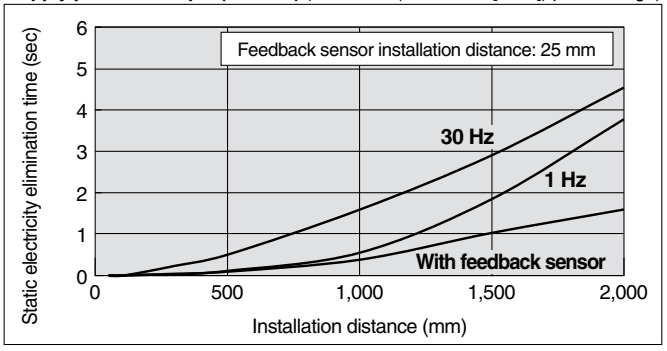
Supply pressure: 15 psi (0.1 MPa) (0.30 scfm (8.6 L/min [ANR]) per cartridge



Supply pressure: 44 psi (0.3 MPa) (0.62 scfm (17.6 L/min [ANR]) per cartridge

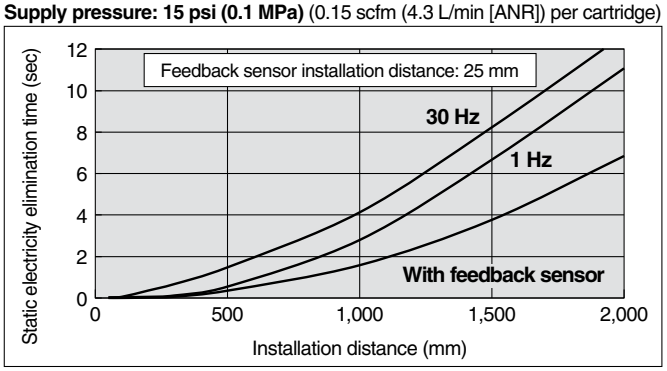


Supply pressure: 44 psi (0.5 MPa) (0.93 scfm (26.4 L/min [ANR]) per cartridge

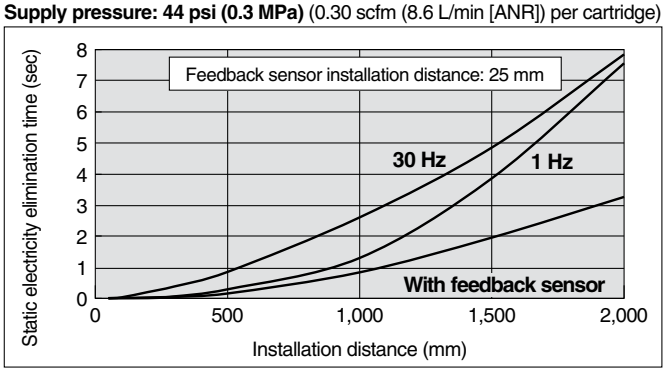


3) With energy saving type de-ionizing cartridge, With air purge

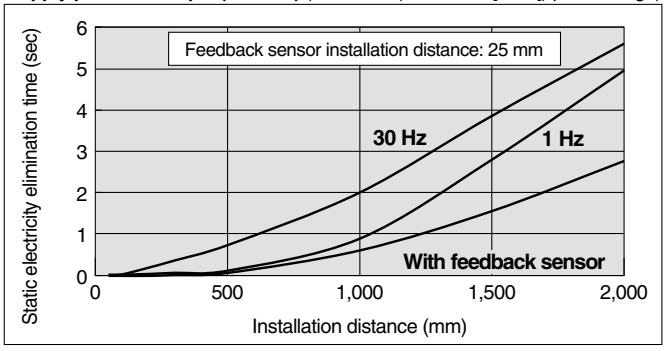
Supply pressure: 15 psi (0.1 MPa) (0.15 scfm (4.3 L/min [ANR]) per cartridge



Supply pressure: 44 psi (0.3 MPa) (0.30 scfm (8.6 L/min [ANR]) per cartridge

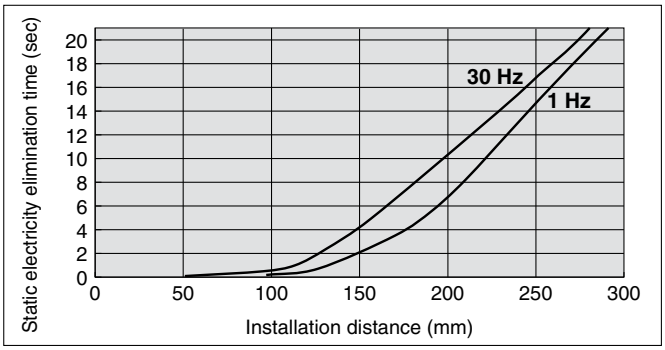


Supply pressure: 73 psi (0.5 MPa) (0.47 scfm (13.3 L/min [ANR]) per cartridge



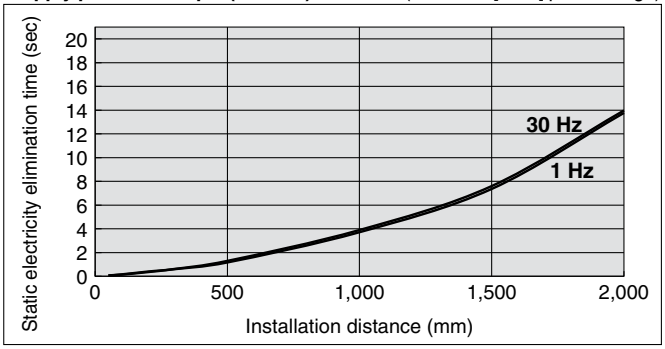
IZS42

1) Without air purge

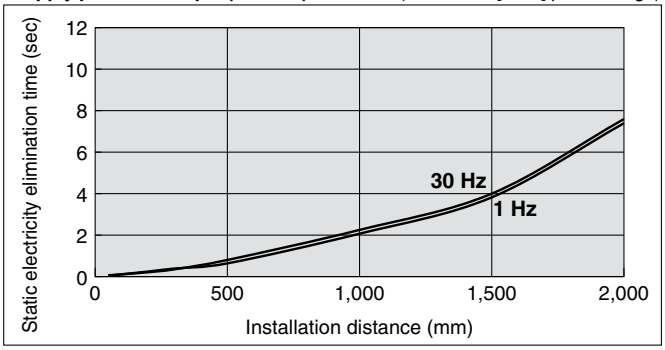


2) With high speed de-ionizing cartridge, With air purge

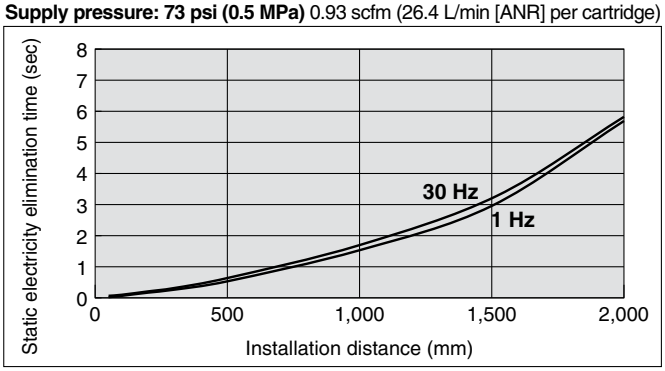
Supply pressure: 15 psi (0.1 MPa) 0.30 scfm (8.6 L/min [ANR] per cartridge)



Supply pressure: 44 psi (0.3 MPa) 0.62 scfm (17.6 L/min [ANR] per cartridge)

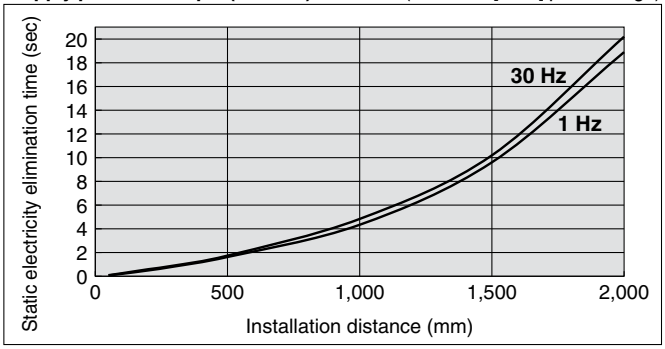


Supply pressure: 73 psi (0.5 MPa) 0.93 scfm (26.4 L/min [ANR] per cartridge)

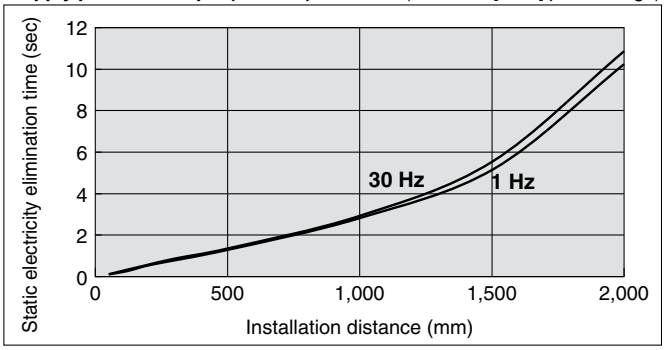


3) With energy saving type de-ionizing cartridge, With air purge

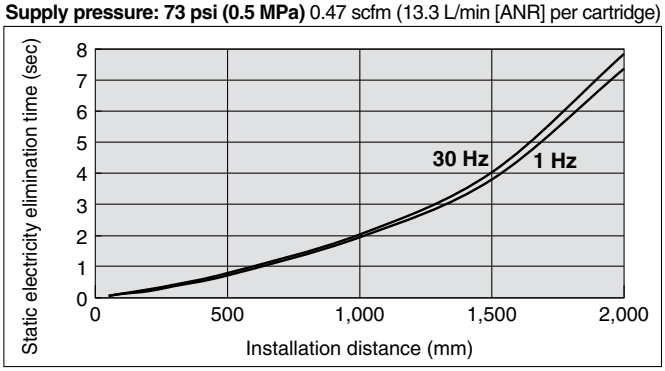
Supply pressure: 15 psi (0.1 MPa) 0.15 scfm (4.3 L/min [ANR] per cartridge)



Supply pressure: 44 psi (0.3 MPa) 0.30 scfm (8.6 L/min [ANR] per cartridge)



Supply pressure: 73 psi (0.5 MPa) 0.47 scfm (13.3 L/min [ANR] per cartridge)



Static Electricity Elimination Characteristics

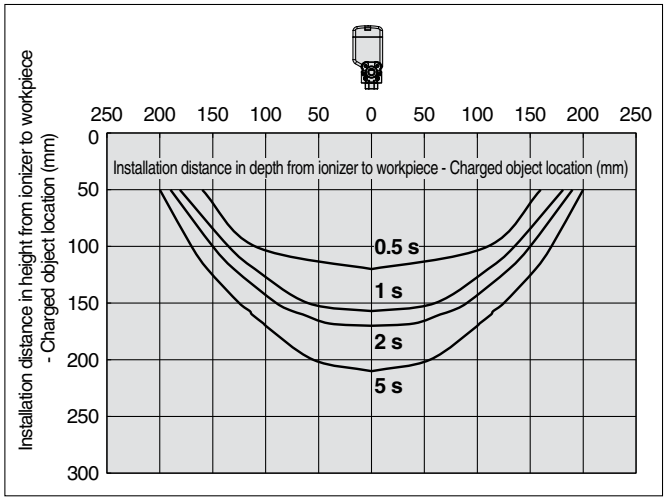
Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material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

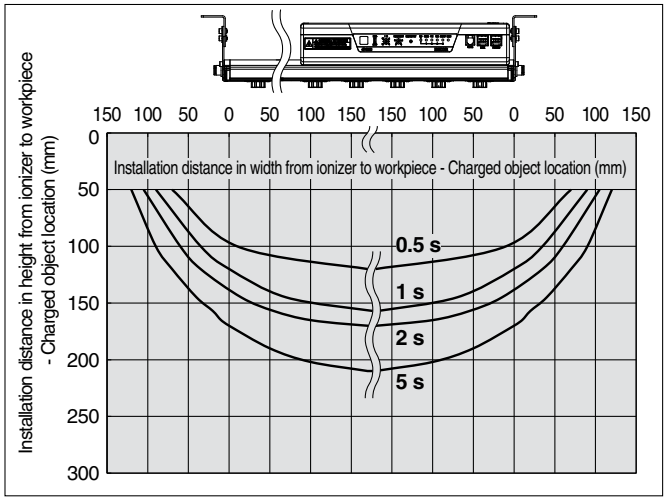
② Static Electricity Elimination Range

IZS40, 41

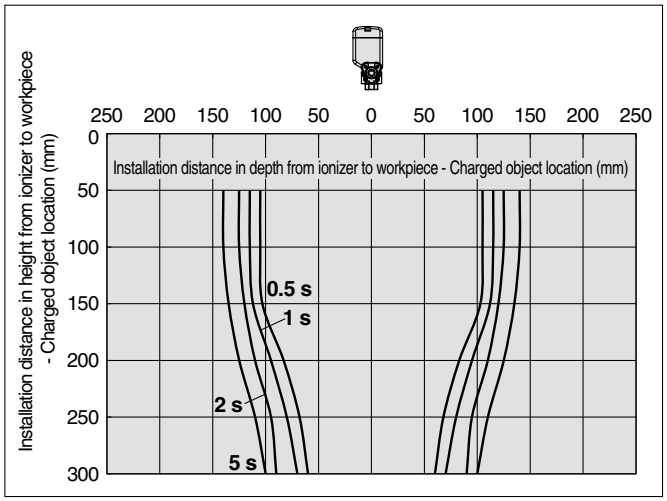
Frequency: 30 Hz

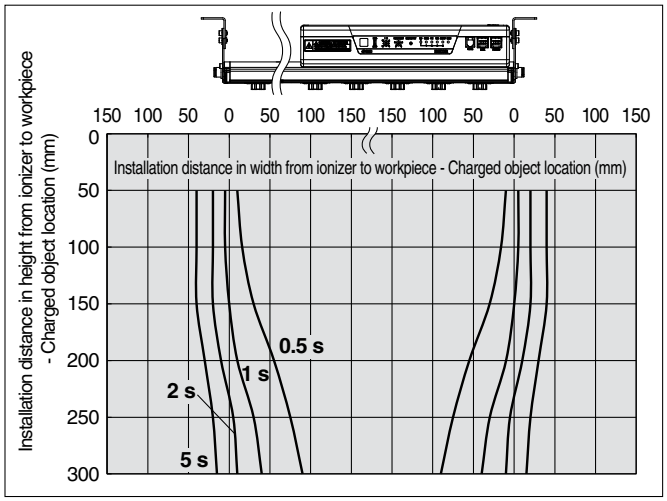
1) Supply pressure: 0 psi (0 MPa)



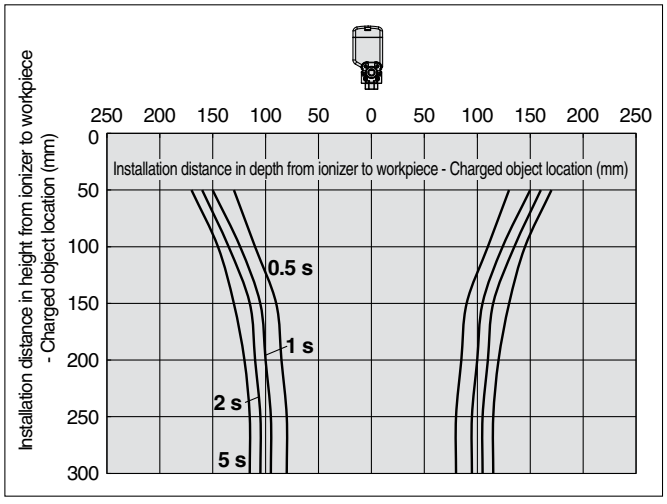


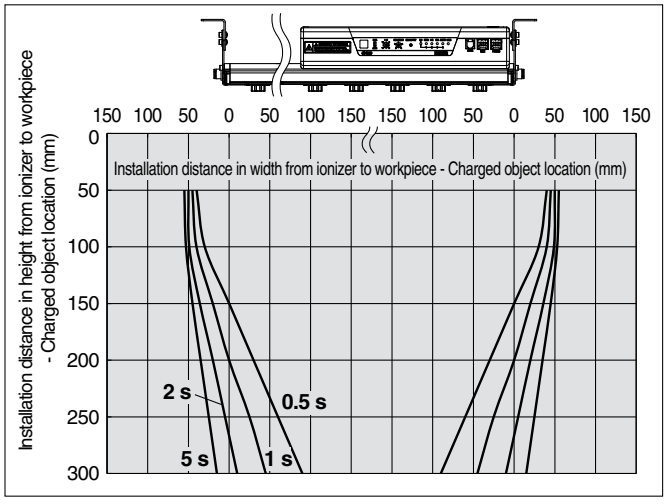
2) With high speed de-ionizing cartridge, Supply pressure: 44 psi (0.3 MPa)





3) With energy saving type de-ionizing cartridge, Supply pressure: 44 psi (0.3 MPa)

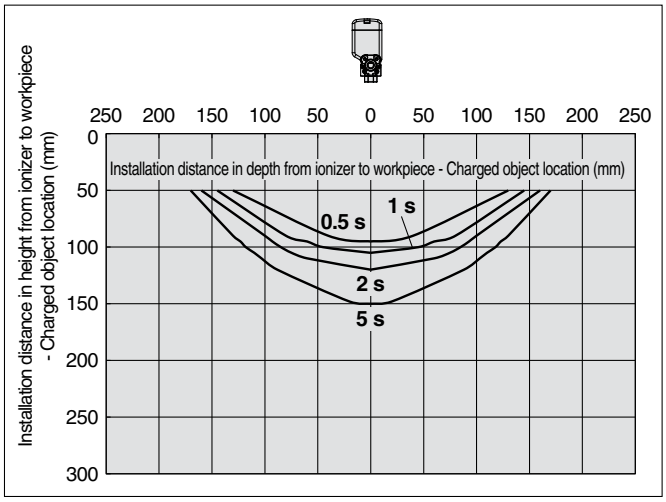


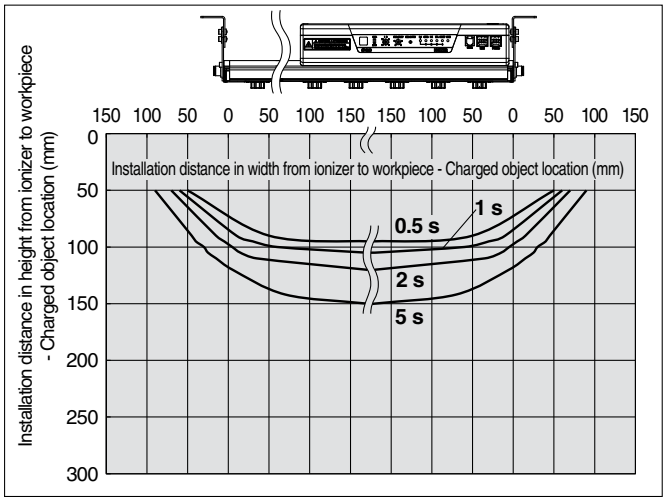


IZS42

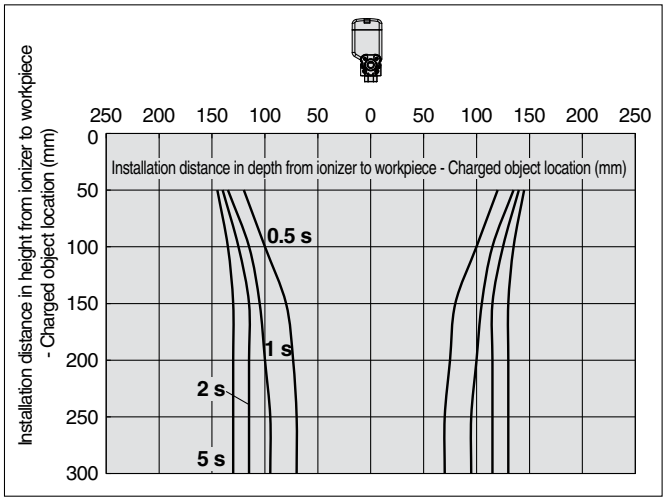
Frequency: 30 Hz

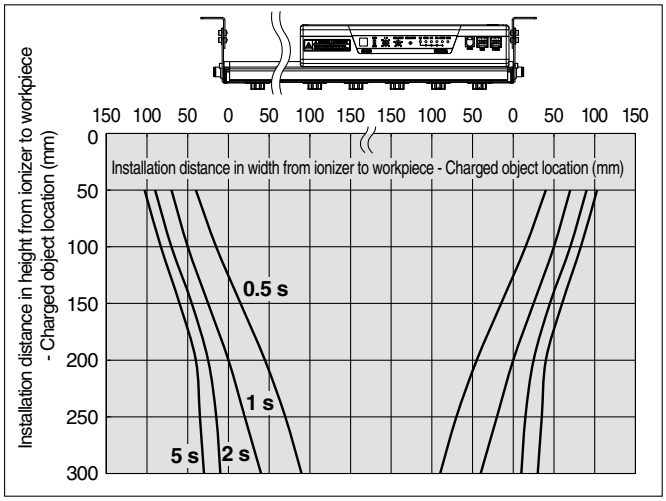
1) Supply pressure: 0 psi (0 MPa)



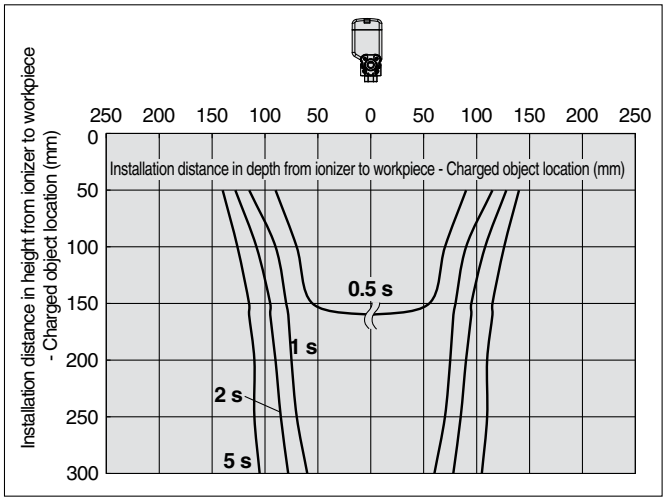


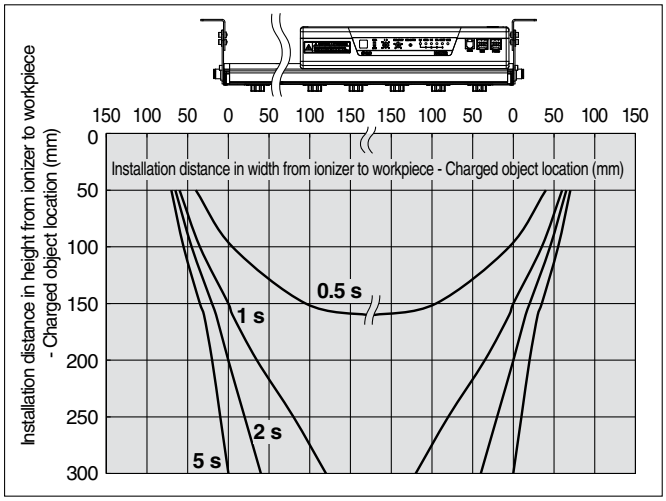
2) With high speed de-ionizing cartridge, Supply pressure: 44 psi (0.3 MPa)





3) With energy saving type de-ionizing cartridge, Supply pressure: 44 psi (0.3 MPa)





Static Electricity Elimination Characteristics

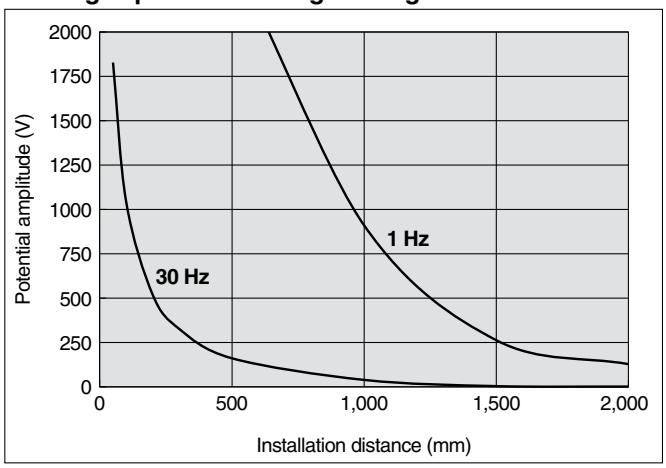
Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3.1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material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

③ Potential Amplitude

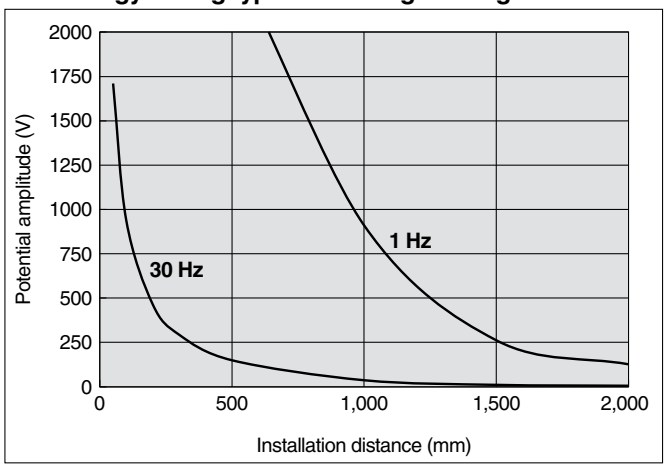
IZS40, 41

Supply pressure: 44 psi (0.3 MPa), Frequency: 30 Hz

With high speed de-ionizing cartridge



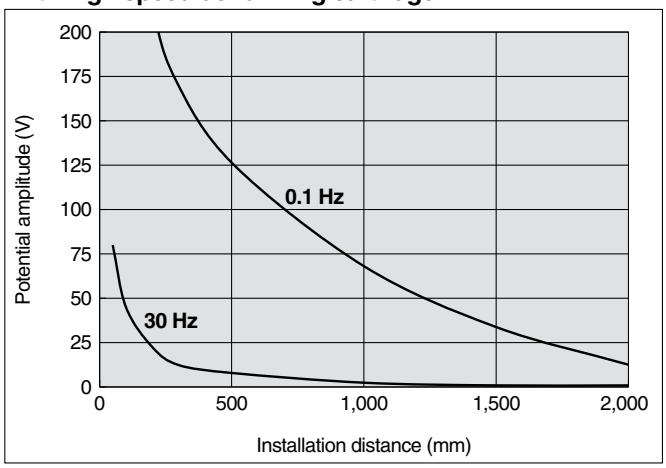
With energy saving type de-ionizing cartridge



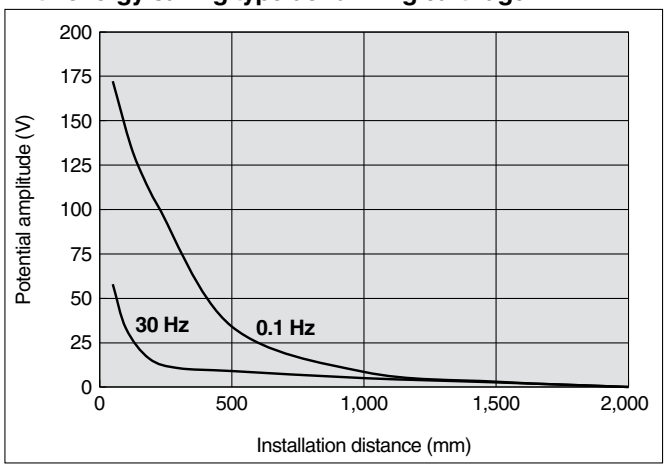
IZS42

Supply pressure: 0.3 MPa, Frequency: 30 Hz

With high speed de-ionizing cartridge

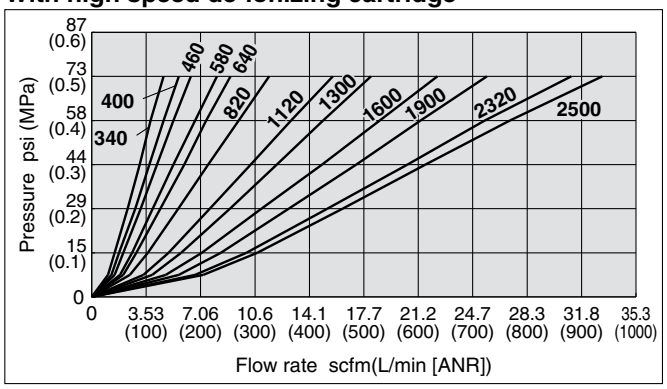


With energy saving type de-ionizing cartridge

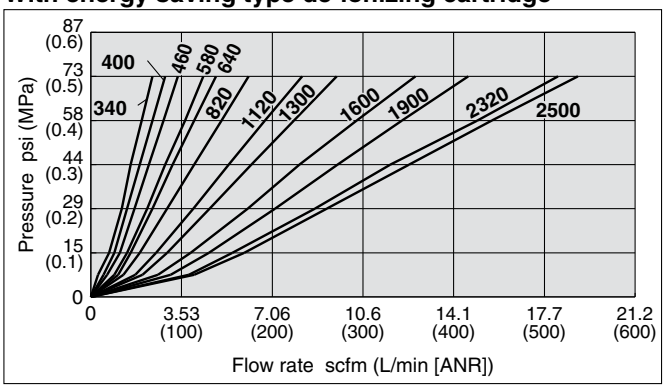


④ Flow Rate — Pressure Characteristics

With high speed de-ionizing cartridge

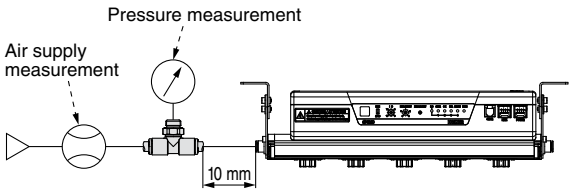


With energy saving type de-ionizing cartridge

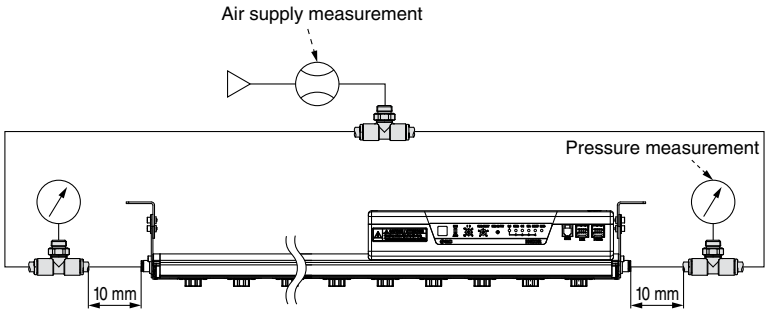


How to measure

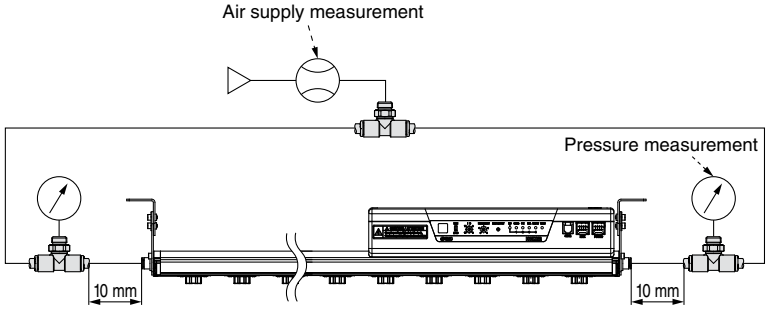
a) Single side air supply (Connecting tube: O.D. ø6 x I.D. ø4) (IZS4□-340, 400, 460, 580, 640)



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

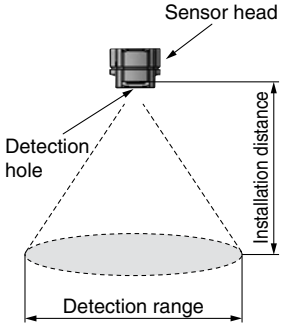


c) Both sides air supply (Connecting tube: O.D. ø8 x I.D. ø5) (IZS4□-1600, 1900, 2320, 2500)



Feedback Sensor Detection Range

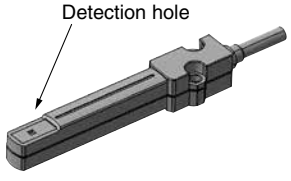
The relationship between the feedback sensor's installation distance and the detection range is as follows:



(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**

41	Feedback sensor type
42	Dual AC type

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

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 20). (A cord is attached to the AC adapter.)

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.

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.

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	73 psi (0.5 MPa) or less				
	Proof pressure	101 psi (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		32 to 104°F (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/s^2				
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	32 to 122°F (0 to 50°C)	
Ambient humidity	35 to 80% Rh (with no condensation)	
Case material	ABS	ABS, Stainless steel
Impact resistance	100 m/s^2	
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	32 to 104°F (0 to 40°C)
Ambient humidity	35 to 65% Rh (with no condensation)
Weight	220 g
Standards/Directive	CE, UL, CSA

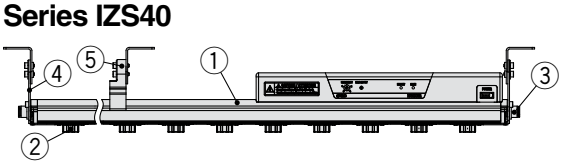
Remote controller (Sold separately)

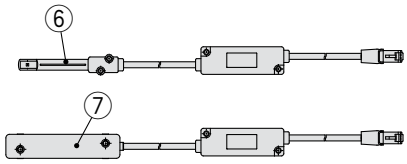
Model	IZS41-RC
Type	Infrared ray type
Transmission capacity	5 m Note 1)
Power supply	2 AAA sized batteries (sold separately) Note 2)
Ambient temperature	32 to 113°F (0 to 45°C)
Ambient humidity	35 to 80% Rh (with no condensation)
Weight	33 g (excluding dry cell batteries)
Standards/Directive	CE

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.

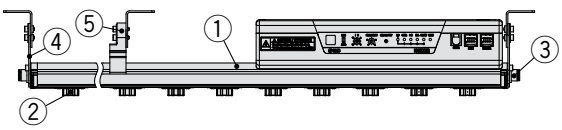
Construction

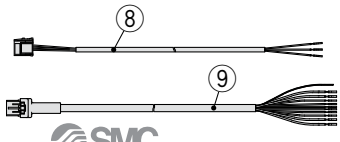
Series IZS40





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

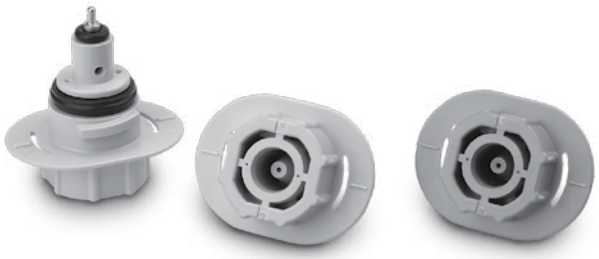
For IZS41/42

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)

Made to Order

How to Order

IZS□-CP□-X13

Type

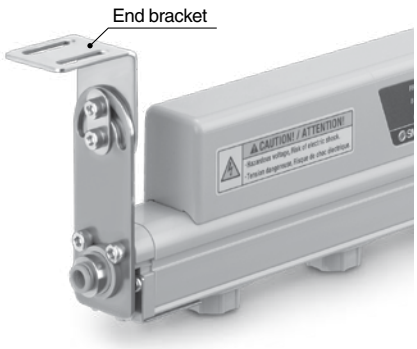
40	For IZS40
41	For IZS41/42

Power supply cable full length

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

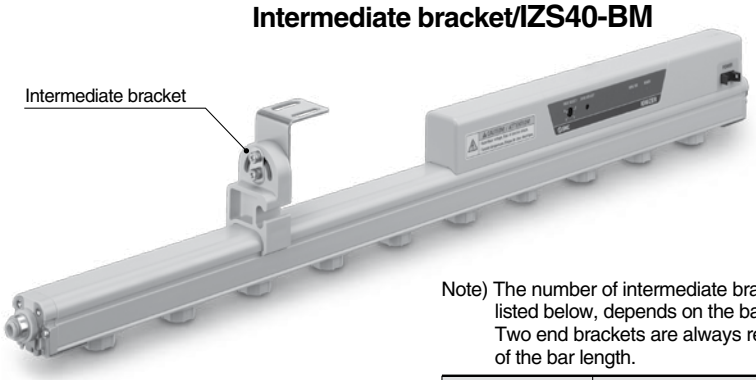
Model with made-to-order power supply cable
Available in 1 m increments from 1 m to 20 m.
Note 1) 10 m or longer power cables are not CE Marking-compliant.
Note 2) Use standard power supply cables for 3 m and 10 m lengths.

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

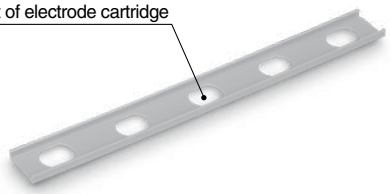
Number of fixed electrode cartridges

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

Number of required drop prevention covers

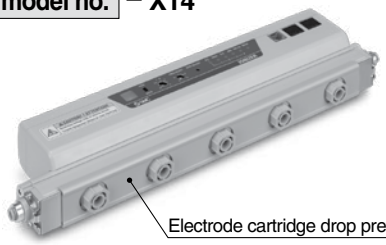
Bar length symbol	Number of required drop prevention covers		
	IZS40-E3	**IZS40-E4**	**IZS40-E5**
340	—	—	1
400	2	—	—
460	1	1	—
580	—	1	1
640	—	—	2
820	1	—	2
1120	1	—	3
1300	2	—	3
1600	2	—	4
1900	2	—	5
2320	1	—	7
2500	2	—	7

Mounted part of electrode cartridge



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



Electrode cartridge drop prevention cover

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.

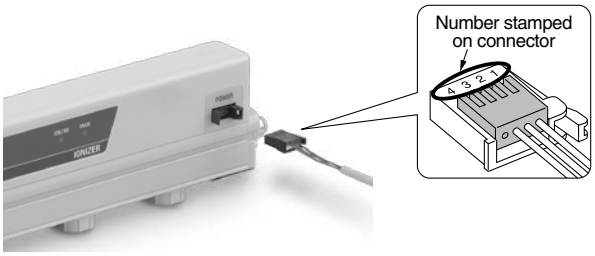
2. Connection circuit ("POWER" connector)

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.)

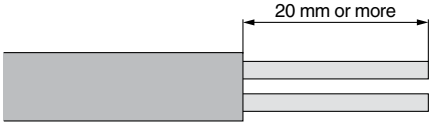


Wiring

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

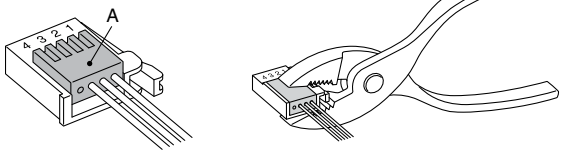
AWG No.	Conductor cross section mm²	Finish O.D. mm	Model
26-24	0.14-0.2	ø0.8-ø1.0	ZS-28-C

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.

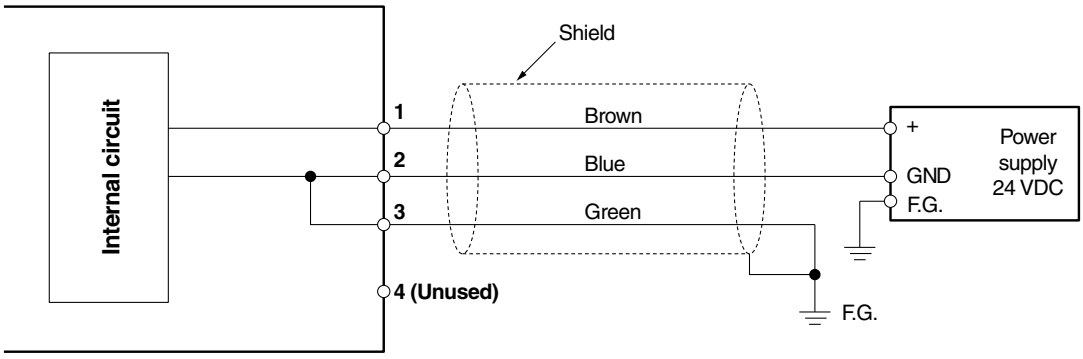
4) Use a tool such as pliers to firmly tighten the center of Part A.

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



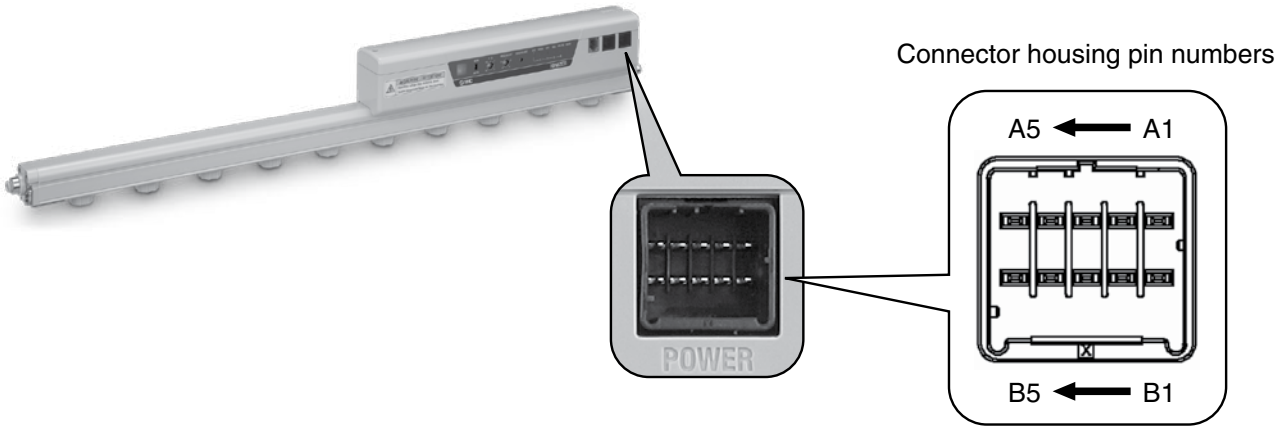
Connection Circuit/IZS40

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

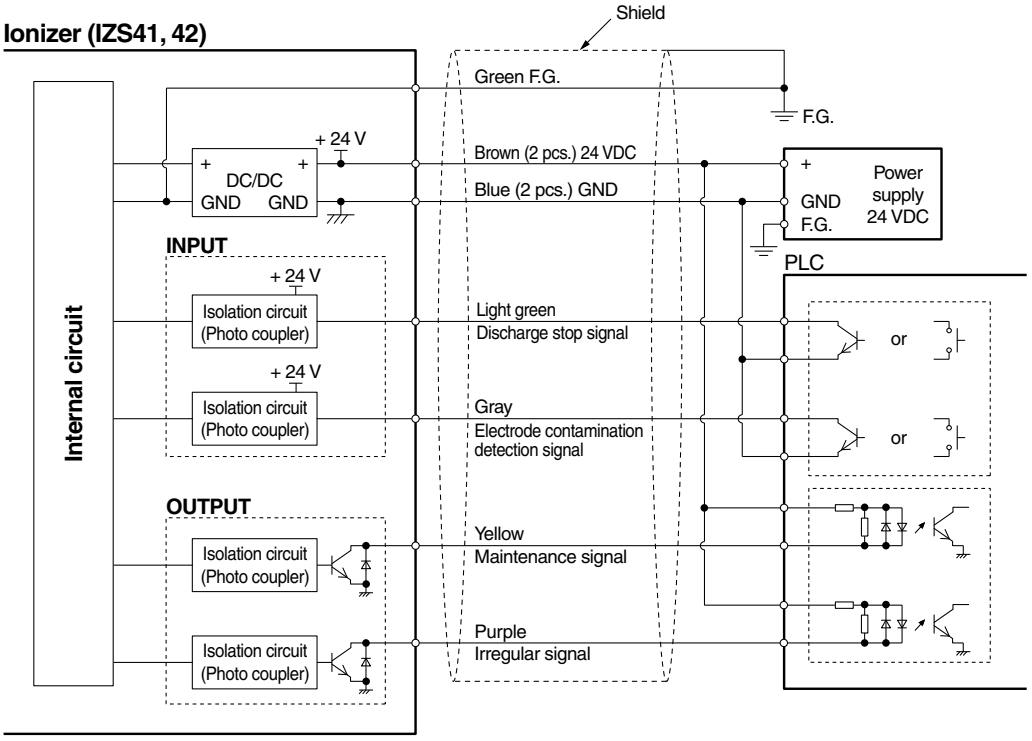


Wiring

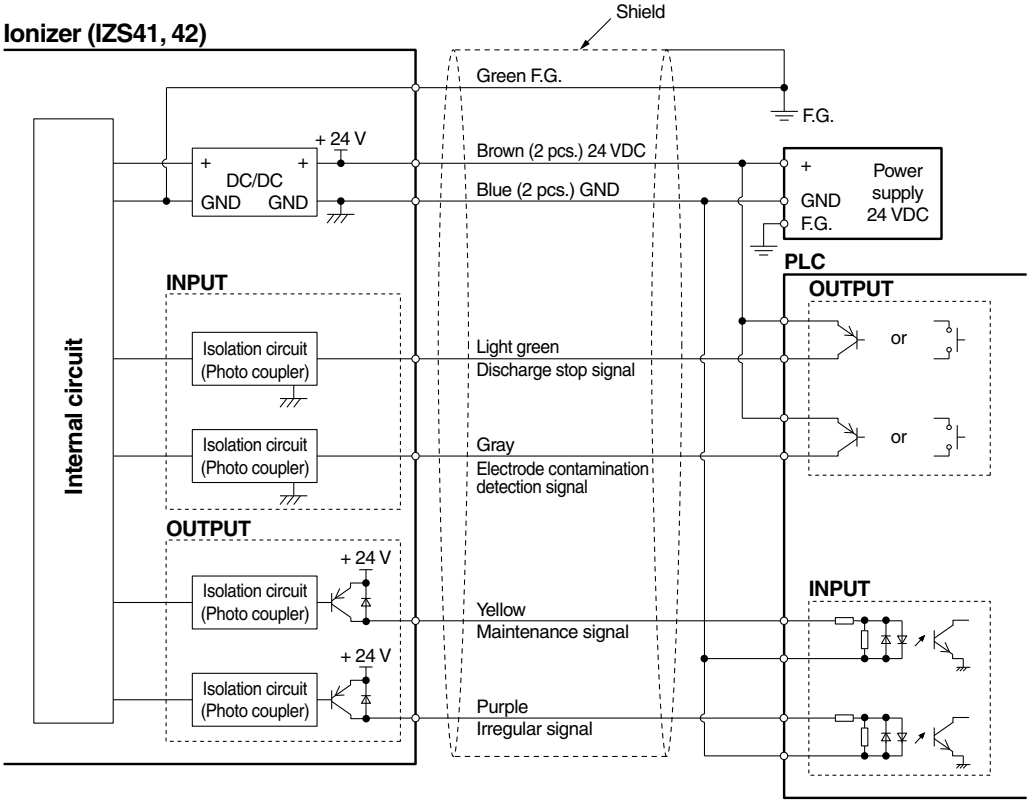
Pin no.	Cable color	Description	Signal direction	Description
A1	Brown	24 VDC	IN	Power supply is connected to operate the ionizer.
B1				
A2	Blue	GND	IN	
B2				
A3	Green	F.G.	—	Make sure to ground with a resistance of 100 Ω or less to use it as a reference electric potential for ionizer.
B3	Light green	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

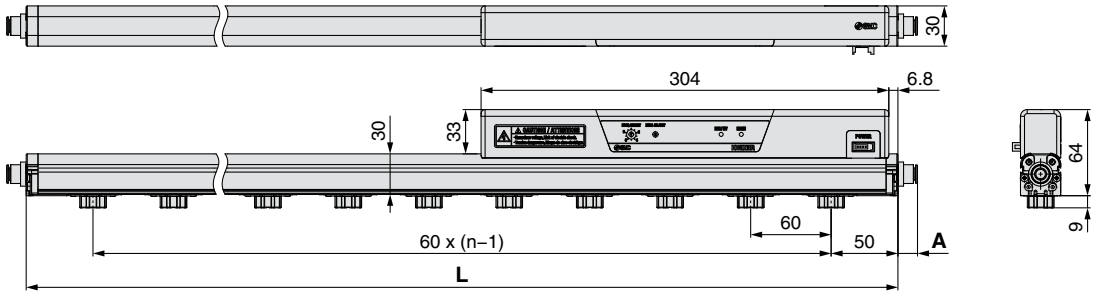


PNP specification



Dimensions

Ionizer/IZS40

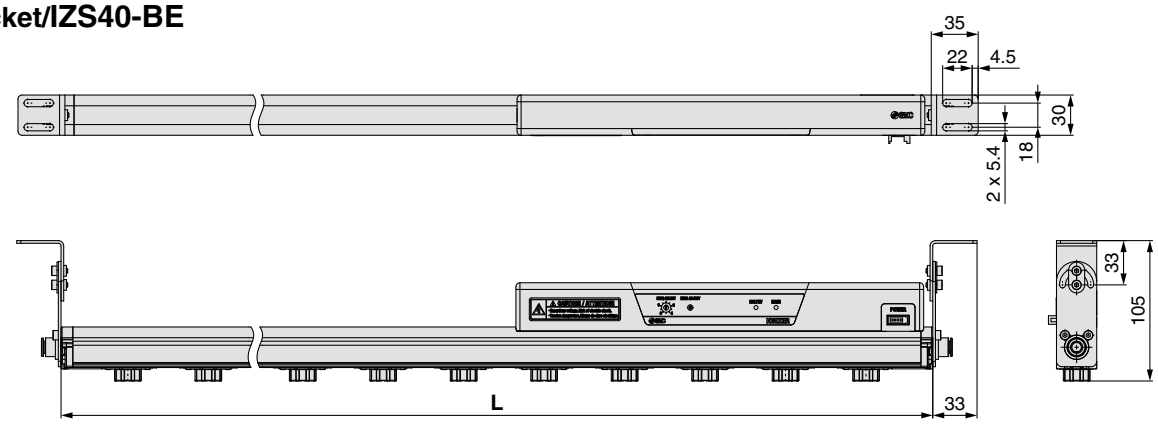


Applicable tube O.D.	A
06	13
08	15
10	22

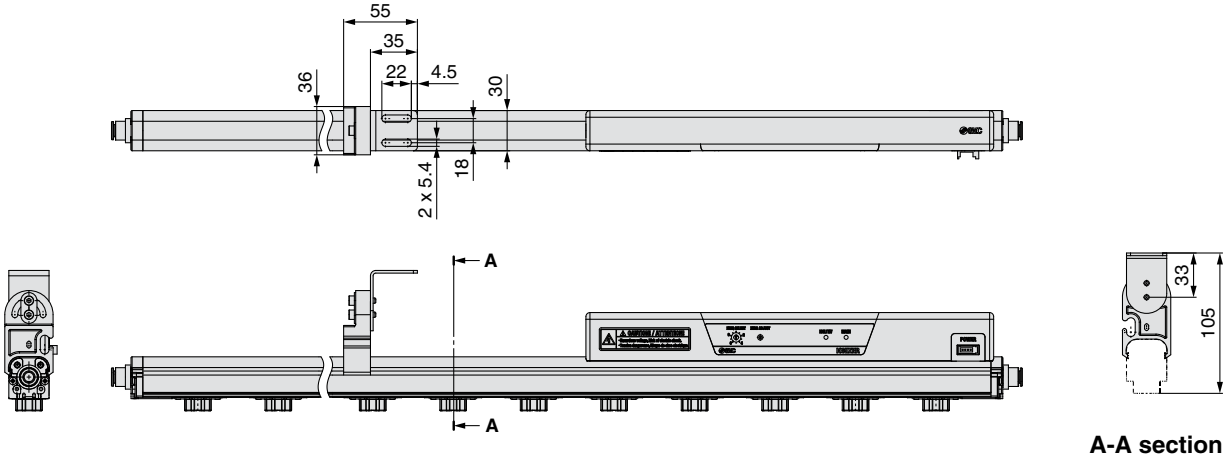
n (Number of electrode cartridges), L Dimension

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



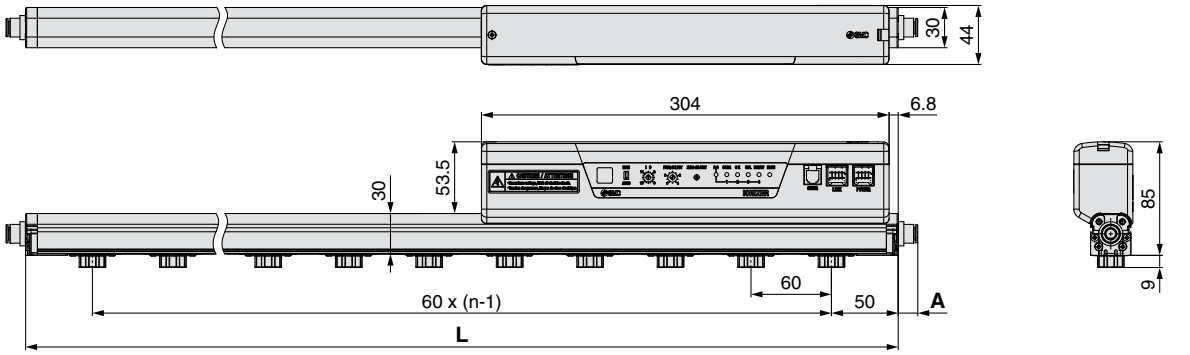
Intermediate bracket/IZS40-BM



A-A section

Dimensions

Ionizer/IZS41, 42

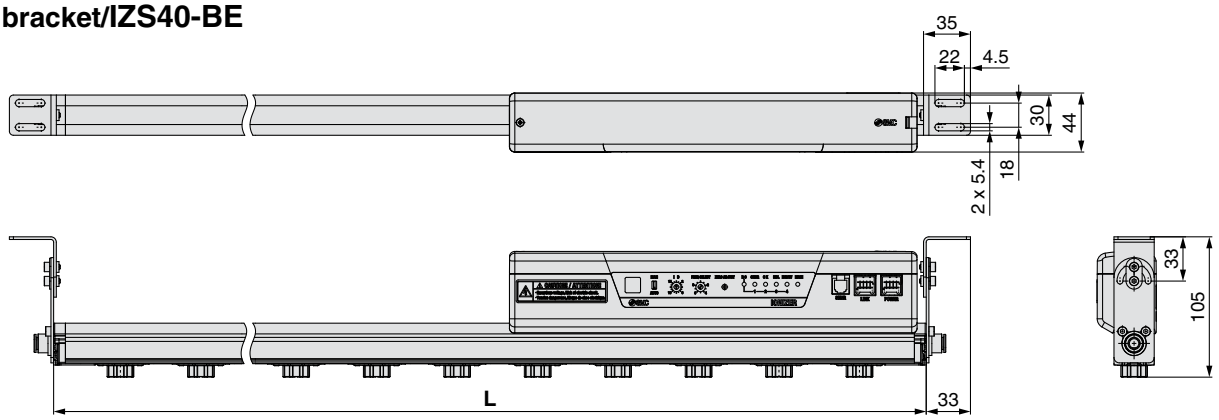


Applicable tube O.D.	A
06	13
08	15
10	22

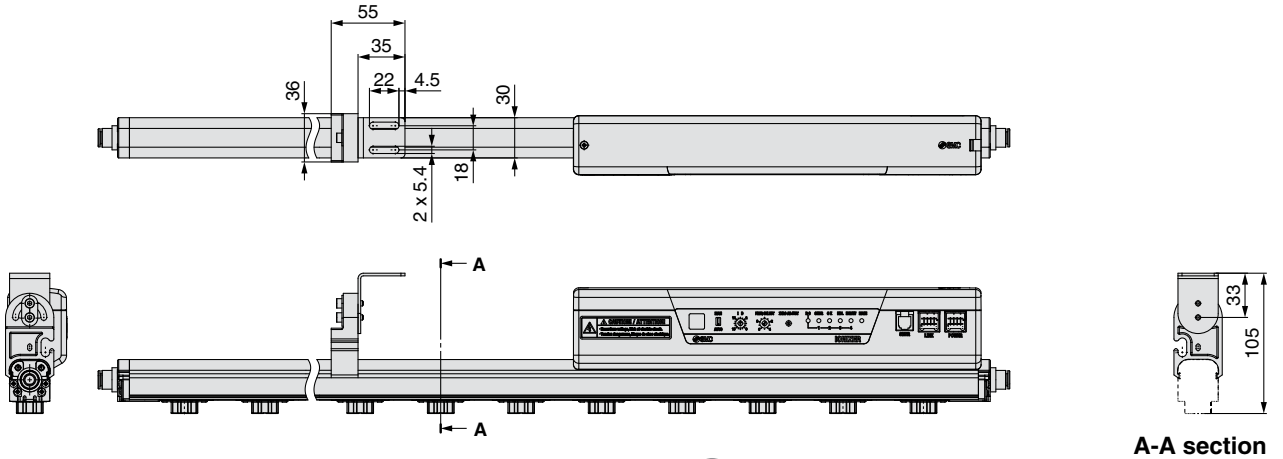
n (Number of electrode cartridges), L Dimension

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



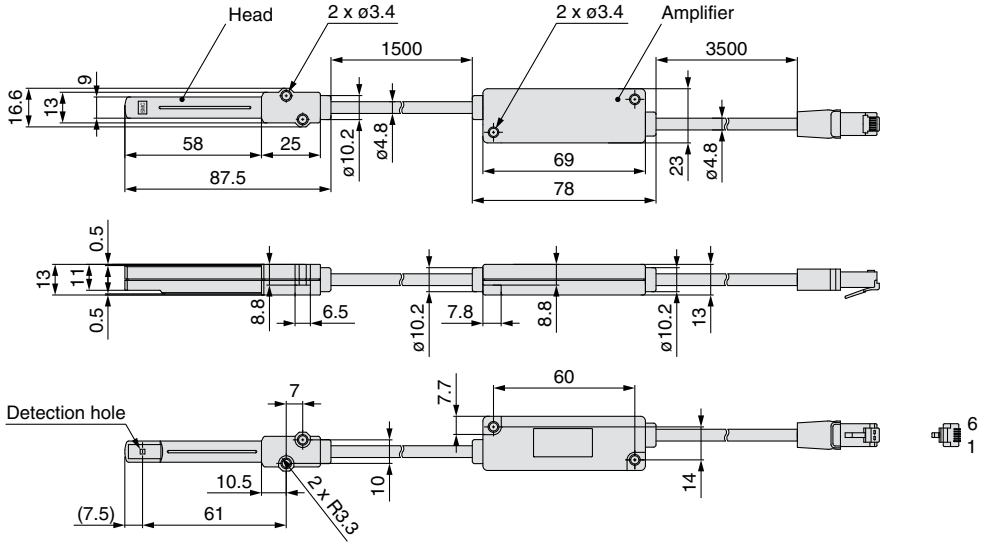
Intermediate bracket/IZS40-BM



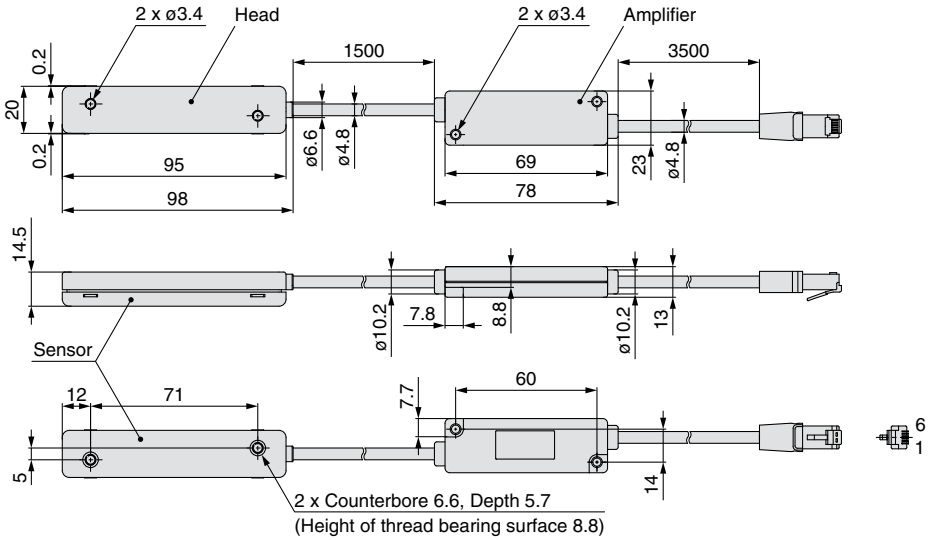
A-A section

Dimensions

Feedback sensor/IZS31-DF

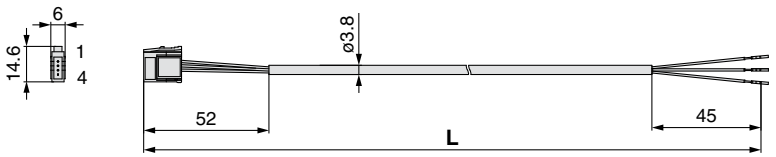


Auto balance sensor [High accuracy type]/IZS31-DG

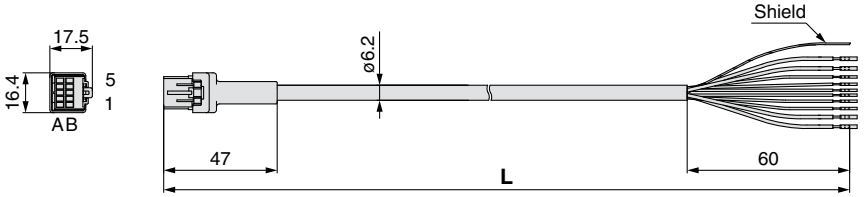


Power supply cable

IZS40-CP□



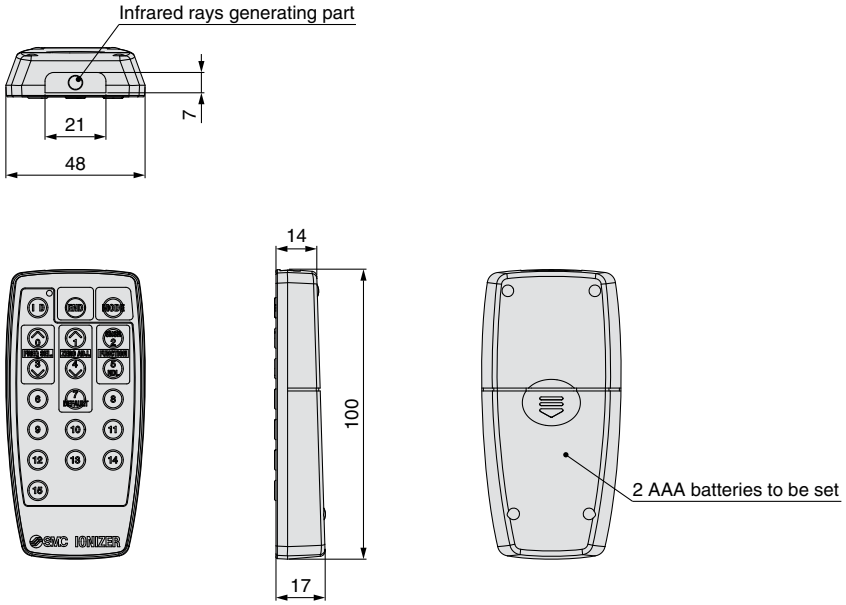
IZS41-CP□



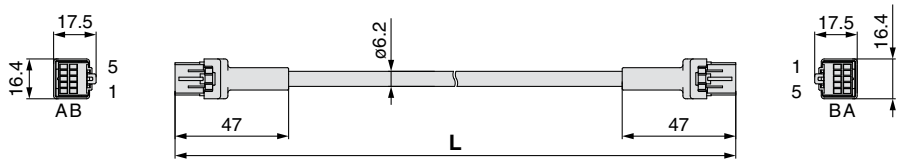
Part no.	**L** (mm)
IZS40-CP	3000
IZS41-CP	
IZS40-CPZ	9800
IZS41-CPZ	

Dimensions

Remote controller



Transition wiring cable/IZS41-CF□



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

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 Safety Instructions), please consult SMC beforehand.

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

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

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

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

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

4. This product is not explosion-protected.

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

⚠Caution

1. Clean specification is not available with this product.

This product is not washed. When bringing into a clean room, flush for several minutes and confirm the required cleanliness before using. A minute amount of particles are generated due to wearing of the 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 68°F (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.

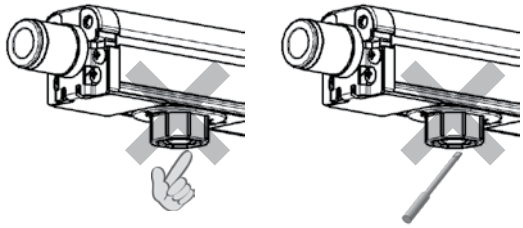
Refer to the operation manual for details.

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

If a finger is used to touch the electrode, it may get stuck or an injury or electrical shock may occur from touching the surrounding equipment. In addition, if the electrode 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

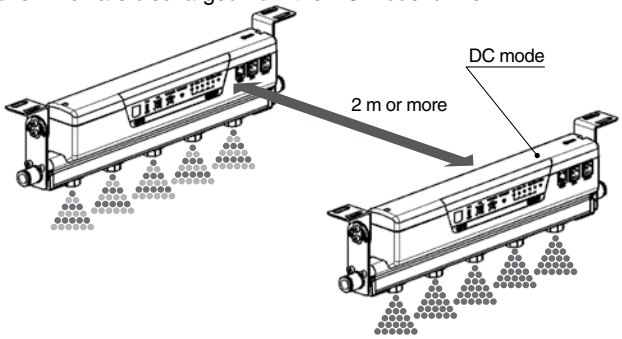
2. After installation, be sure to verify the effects of static electricity elimination.

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				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)

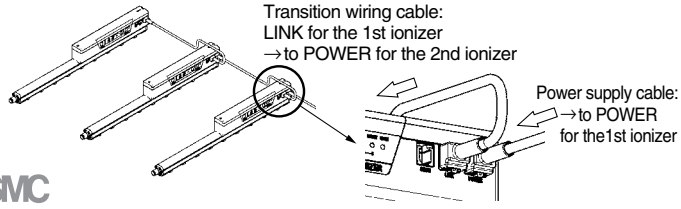
Bar length symbol	Power supply cable length: 3 m										Power supply cable length: 10 m									
	Transition wiring cable length (same cable length) m										Transition wiring cable length (same cable length) m									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
340																				
400						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

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; 32 to 104°F (0 to 40°C) for ionizer, 32 to 122°F (0 to 50°C) for feedback sensor and auto balance sensor (high accuracy type), 0 to 40°C for AC adapter, and 32 to 113°F (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.

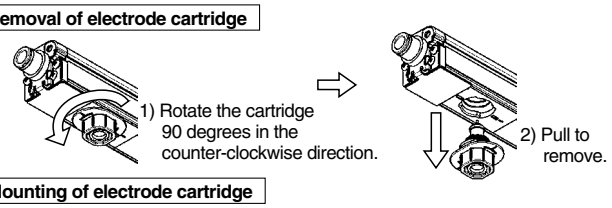
Maintenance

⚠Warning

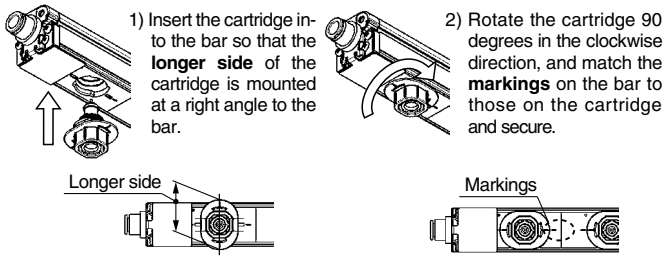
2. When cleaning the electrode needle or replacing the electrode cartridge, be sure to turn off the power supply or air supply to the body.

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 modified products may not achieve the performances guaranteed in the specifications, and exercise caution because the product will not be warranted.

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.

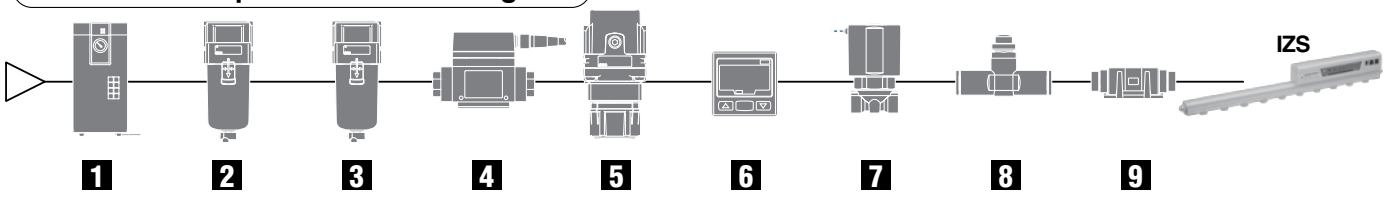
If the modular plug is at a difficult angle to attach/detach, the jack's mounting section may be damaged and cause a disorder.

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.

Best Pneumatics No.5

2 Air Filter/Series AF

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

Best Pneumatics No.5

3 Mist Separator/Series AFM

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

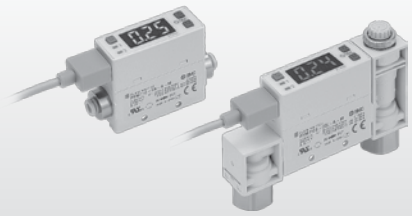
Best Pneumatics No.5

4 Digital Flow Switch/Series PF2A

Decreases the air consumption by flow control.

Best Pneumatics No.6

2-Color Display Digital Flow Switch/Series PFM



Best Pneumatics No.6

5 Regulator/Series AR

Decreases the air consumption by setting to an appropriate pressure.

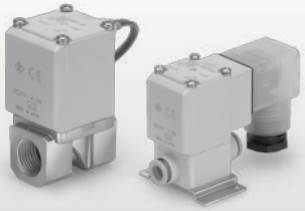
Best Pneumatics No.5

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.

Best Pneumatics No.6

7 2 Port Solenoid Valve/Series VX



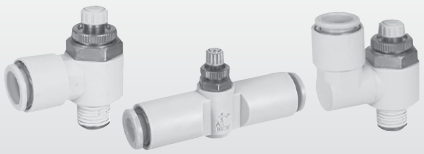
Best Pneumatics No.7

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

Best Pneumatics No.7

8 Restrictor/Series AS-X214

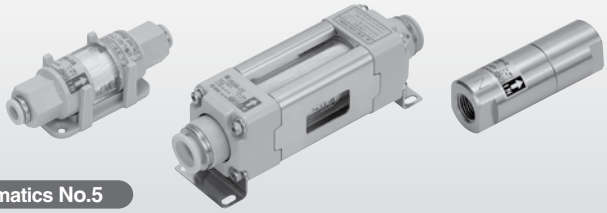
Regulates to the appropriate air volume depending upon the installation condition.
Decreases the air consumption.



Best Pneumatics No.6

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.



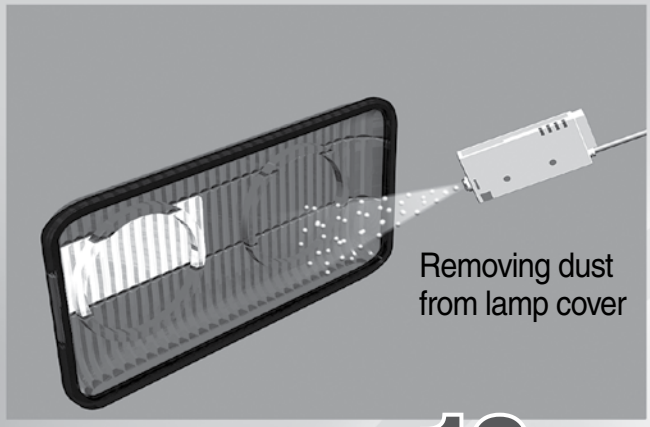
Best Pneumatics No.5

Ionizer Nozzle type

Series IZN10

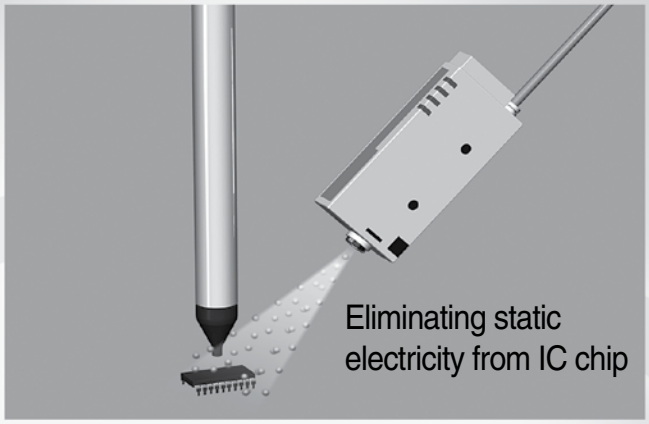
Dust removal and static electricity elimination by air blow

• 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

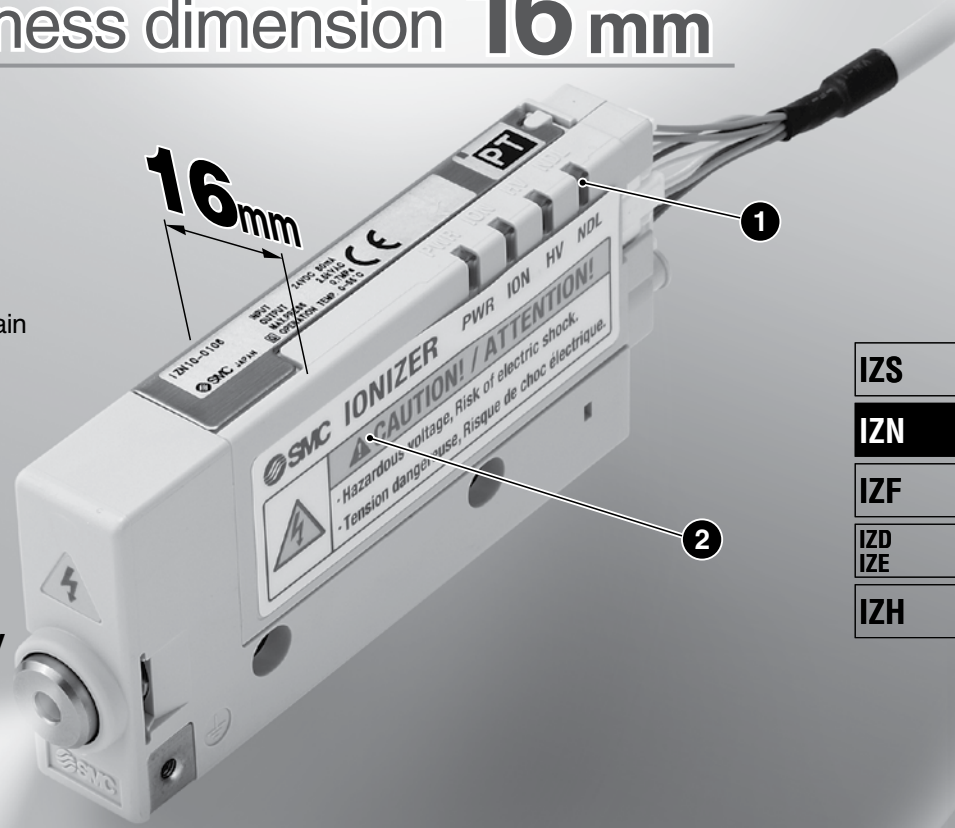
RoHS compliant

❶ 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.

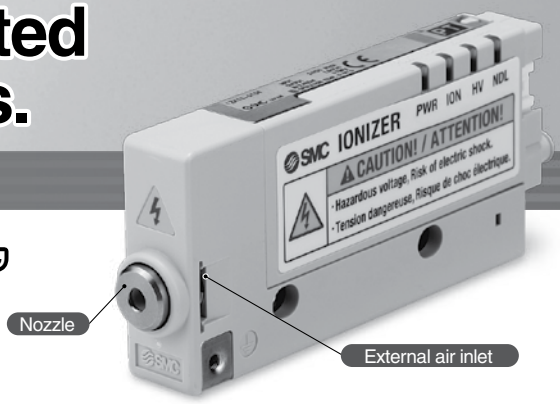
❷ With built-in power supply substrate

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



Nozzle type can be selected according to applications.

Energy saving static electricity elimination nozzle

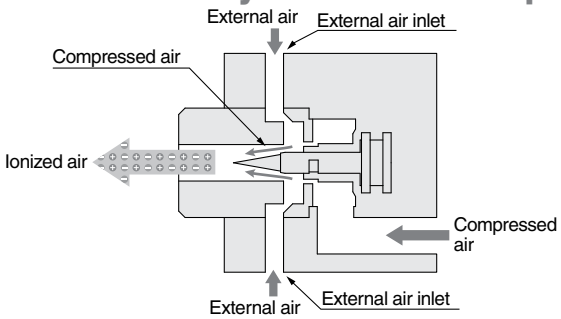


Short range static electricity elimination, Design focuses on ion balance.

Ion balance: ±10 V

Increases flow volume by external air intake

Static electricity elimination is possible with minimal air consumption.



In cases with same air consumption, static electricity is eliminated in half the time.

(Supply pressure 44 psi (0.3 MPa))

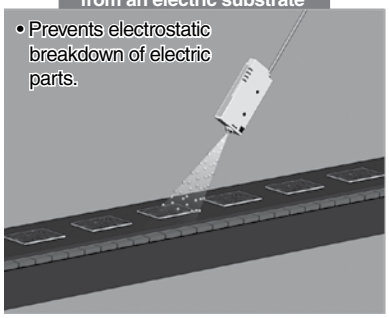
External air inlet	None	Yes
Air consumption flow rate scfm (L/min (ANR)	0.35 (10)	**0.35 (10)**
Static electricity elimination time* sec	5	**2.5**
Ionized air flow velocity* m/s	0.4	**2.5**

Reduced by 50%

Improved 6 times

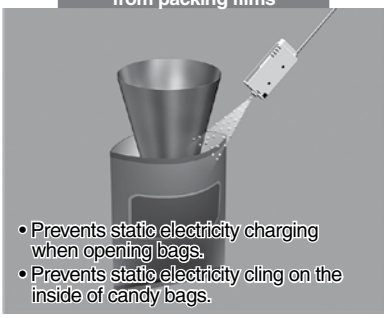
* At 300 mm distance

Eliminating static electricity from an electric substrate



Eliminating static electricity from lens

Eliminating static electricity from packing films



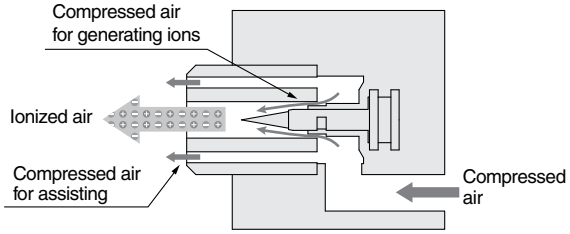
High flow static electricity elimination nozzle

Long range static electricity elimination and dust removal

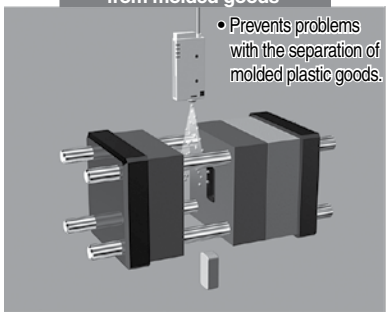
Ionized air assisted by the compressed air

- Improved dust removal performance by the energy of compressed air.
- Suitable for static electricity elimination at a long distance (max. 500 mm).

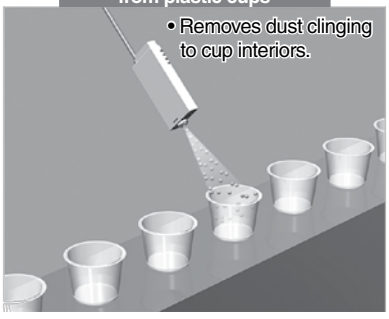
Ion balance: ±15 V



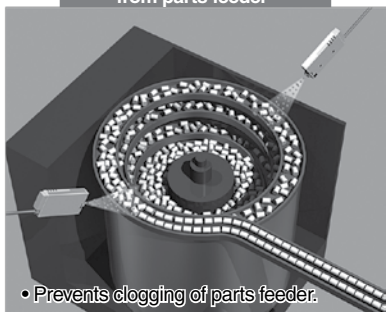
Eliminating static electricity from molded goods



Eliminating static electricity from plastic cups



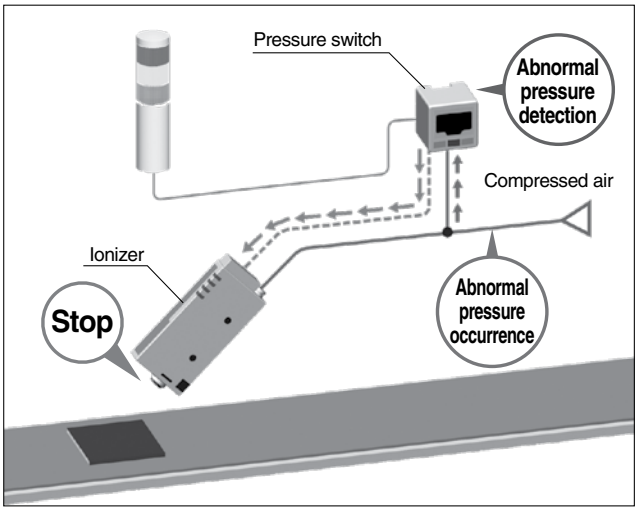
Eliminating static electricity from parts feeder



External switch input function (2 inputs)

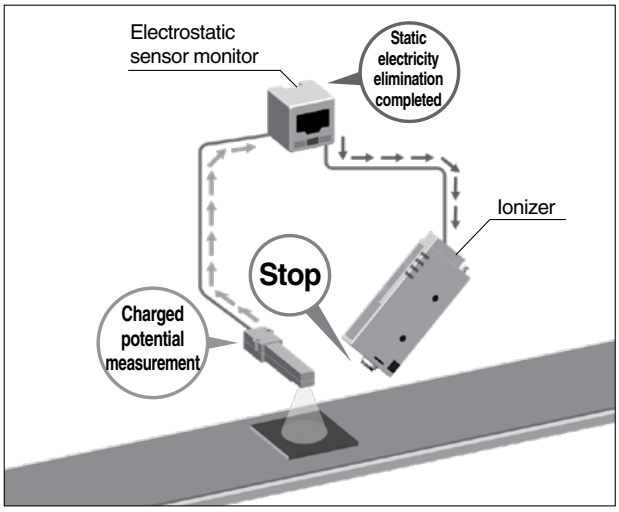
Prevents static electricity elimination trouble due to pressure drop of compressed air.

Emission of static electricity is suspended when abnormal purge air pressure is detected by pressure switch.



Energy saving with electrostatic sensor

Emission of static electricity is suspended when an electrostatic sensor detects that static electricity elimination is completed.



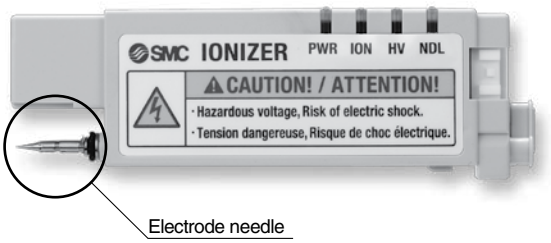
Easy maintenance

Possible to conduct maintenance on the electrode needle without removal of body.
No need to readjust the nozzle angle when the ionizer is restarted.

Body

● Possible to conduct maintenance without removal of body.

Cartridge



● Tools unnecessary for the installation or removal of the cartridge!

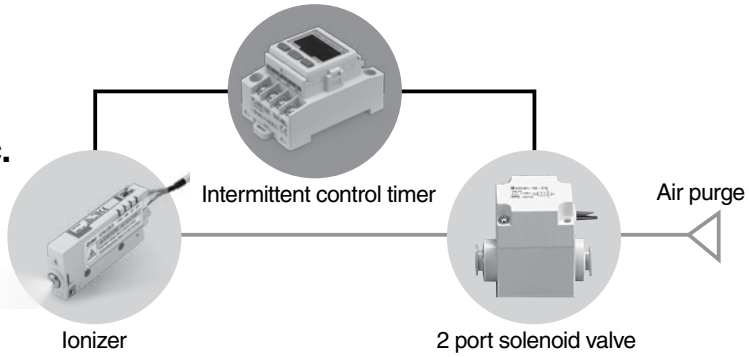
Intermittent control timer

Made to Order

IZE110-X238

A digital timer that can control ON/OFF switches of valves etc.

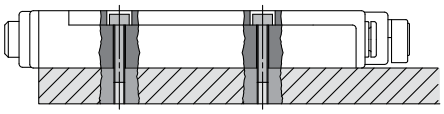
Improved dust removal effect under low air consumption by intermittent ion blowing



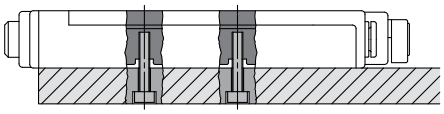
Mounting variations

Direct mount

▶ Top through-hole mounting

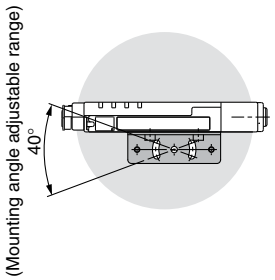


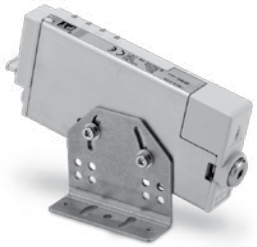
▶ Bottom tapped mounting

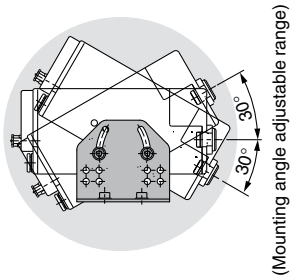


Bracket mount

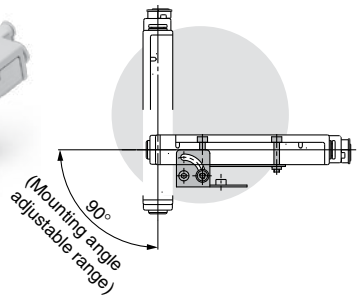
▶ L-bracket



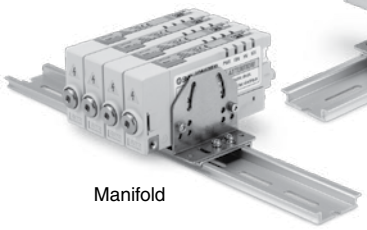


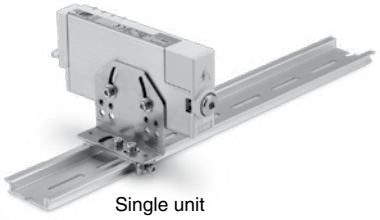


▶ Pivoting bracket



▶ DIN rail mounting bracket

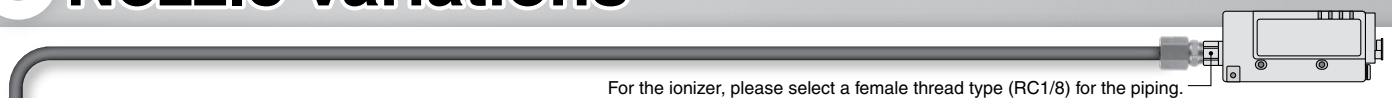




• The L-bracket and the DIN rail mounting bracket can be used with the manifold.

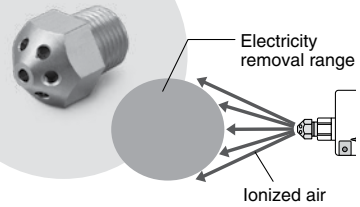
Nozzle variations

Made to Order

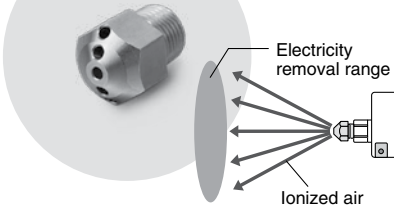


For the ionizer, please select a female thread type (RC1/8) for the piping.

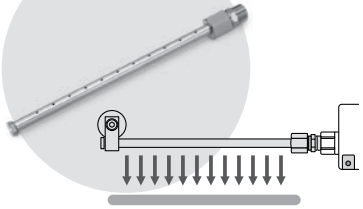
Circular diffusion nozzle



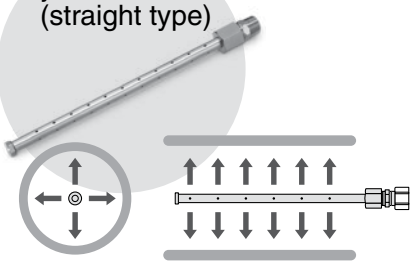
Flat diffusion nozzle



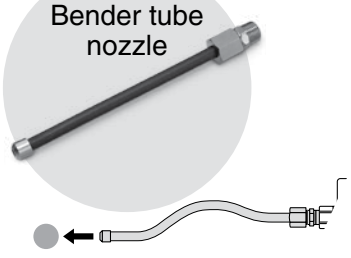
Bar nozzle (straight type)



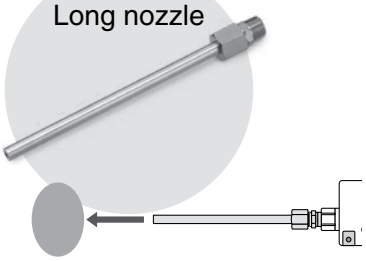
Circumferential jet bar nozzle (straight type)



Bender tube nozzle



Long nozzle

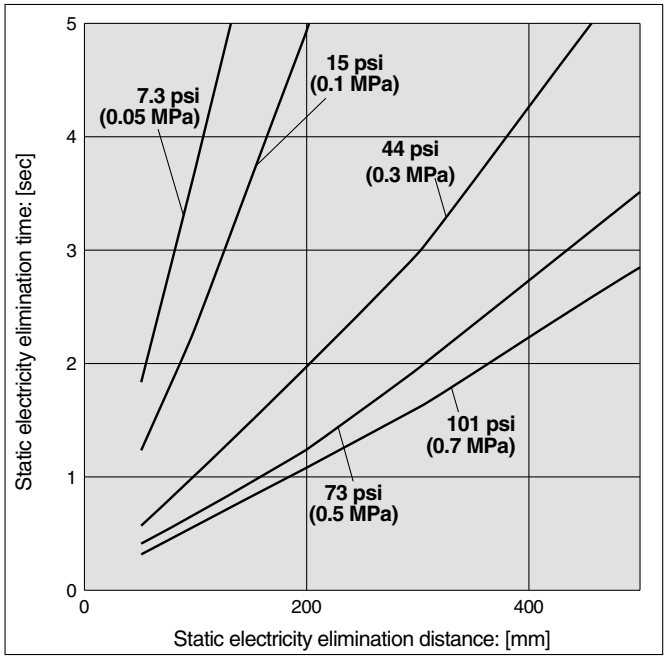


Technical Data 1

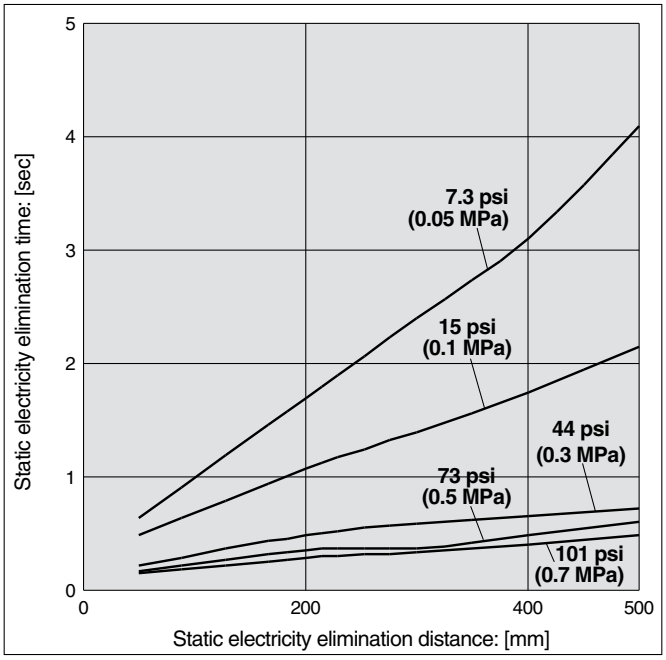
Note) Static electricity elimination features are based on the data using the charged plate (size: 150 mm x 150 mm, capacitance: 20 pF) as defined in the U.S. ANSI standards (ANSI/ESD, STM3, 1-2006). Use this as a guideline purpose only for model selection because the value varies depending on the material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

Static Electricity Elimination Characteristics (Static Electricity Elimination Time from 1000 V to 100 V)

(1) Energy saving static electricity elimination nozzle/IZN10-01



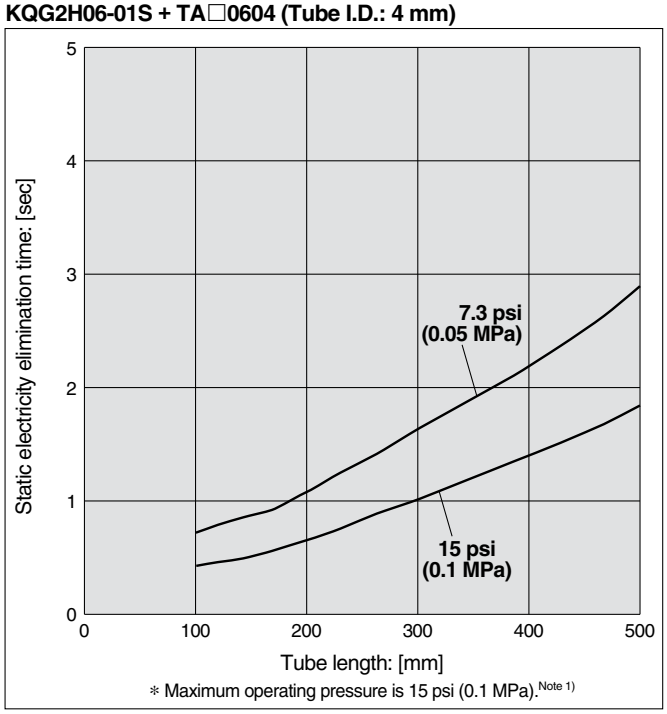
(2) High flow rate nozzle/IZN10-02



(3) Female threads for piping/IZN10-11 With Stainless steel 316 One-touch fitting/KQG2 + Anti-static tubing/TA□

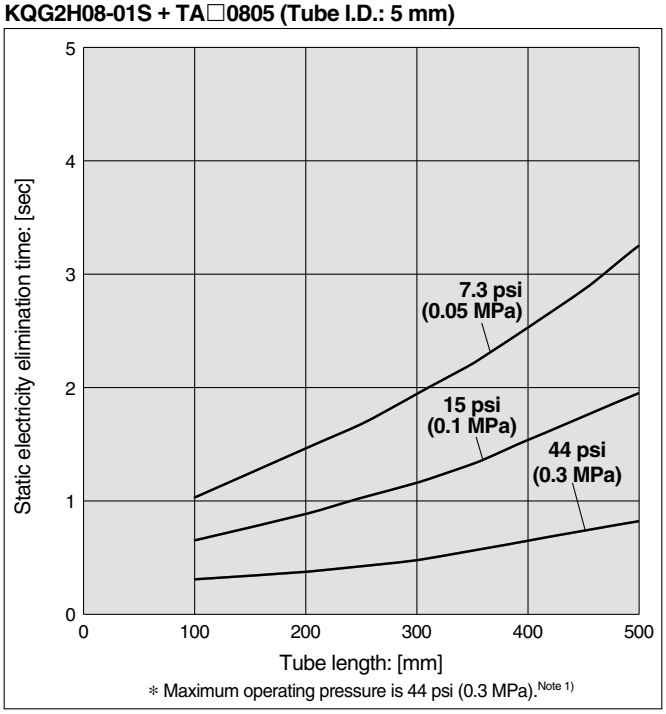
∗ Static electricity elimination time at a distance of 50 mm from the end of tube.

KQG2H06-01S + TA□0604 (Tube I.D.: 4 mm)



∗ Maximum operating pressure is 15 psi (0.1 MPa).[Note 1)]

KQG2H08-01S + TA□0805 (Tube I.D.: 5 mm)



∗ Maximum operating pressure is 44 psi (0.3 MPa).[Note 1)]

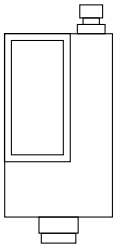
Note 1) If a pressure over the maximum operating pressure is applied, the electrode needle contamination detector will work and turn on the LED.
- The ion generating efficiency of the high frequency AC type ionizer will decrease when the pressure around the electrode needle reaches 15 psi (0.1 MPa) or more, due to its ion generating mechanism. This means that even when the electrode needle is not contaminated, the electrode needle contamination detector may work depending on the condition of the connected tube and other reasons.
- In the range where the contamination detection signal is generated, a small amount of ions are still generated, so it can be used in some operating conditions. In this case, please consider using a type without the contamination detector. (Page 40)
- When the tube is connected using the female threads for piping / IZN10-11, be sure to check static electricity elimination performance beforehand.

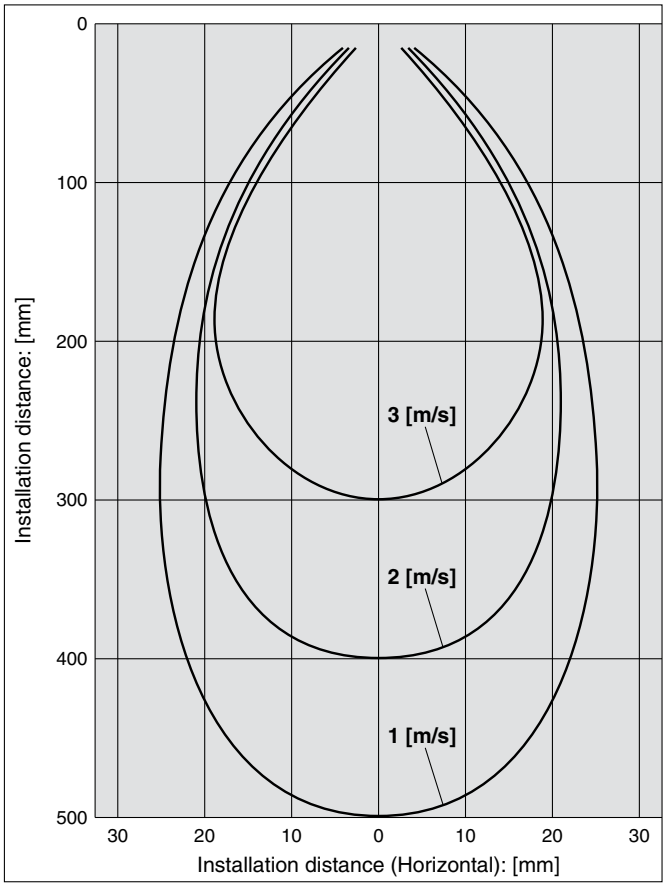
Note 2) The ionizer generates a small amount of ozone. Select ozone-resistant fittings for the female threads for piping. Also, regularly check there is no deterioration due to ozone.

Technical Data 2

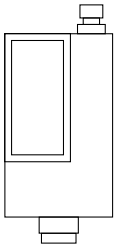
Blow Velocity Distribution (Supply Pressure: 44 psi (0.3 MPa))

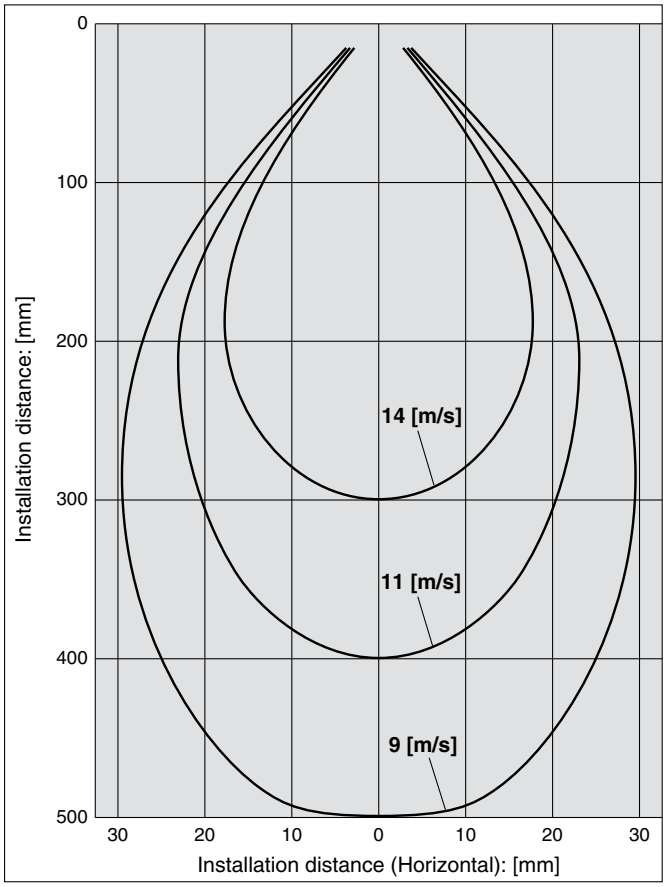
(1) Energy saving static electricity elimination nozzle/IZN10-01





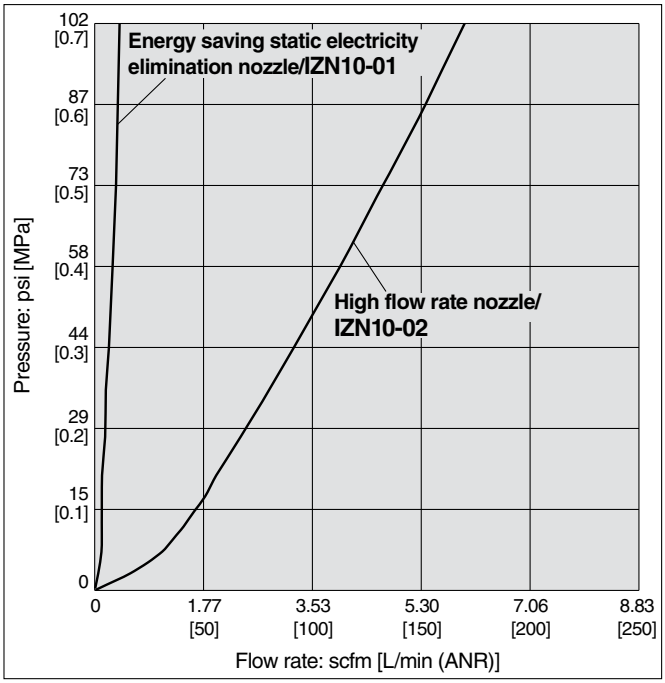
(2) High flow rate nozzle/IZN10-02



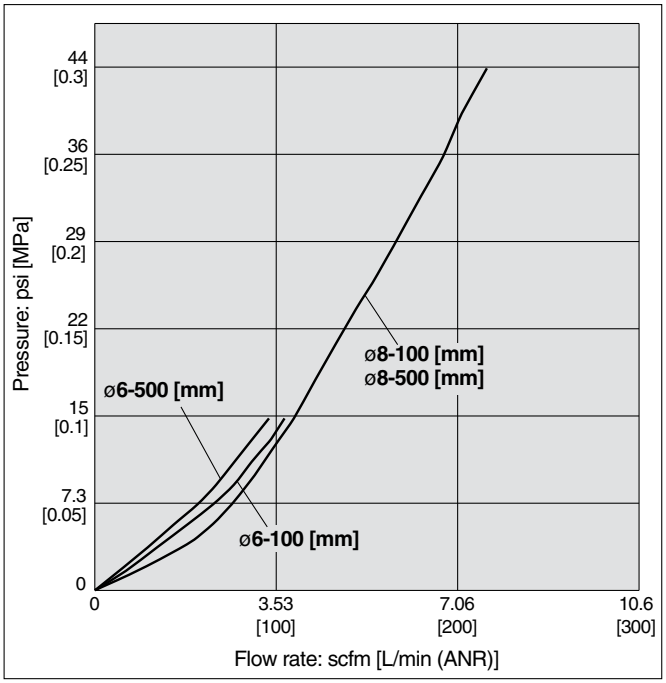


Flow Characteristics

(1) Energy saving static electricity elimination nozzle/IZN10-01
(2) High flow rate nozzle/IZN10-02



(3) Female threads for piping/IZN10-11
With Stainless steel 316 One-touch fitting/KQG2
+ Anti-static tubing/TA□



Note) When a pressure above each line is used, the electrode needle contamination detector will work and turn on the LED.
(Refer to the bottom note 1 on page 36.)

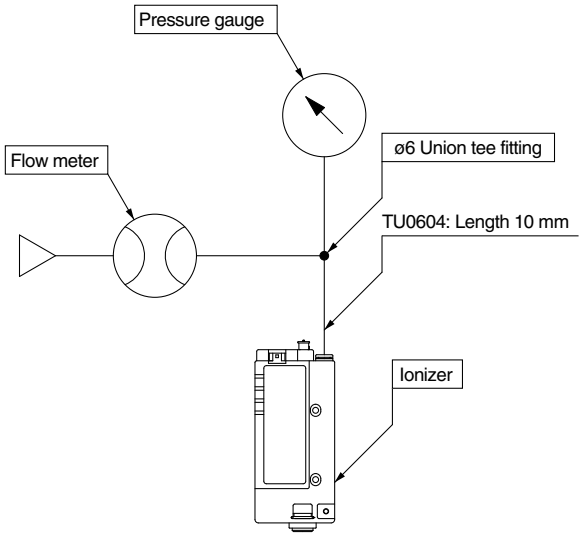
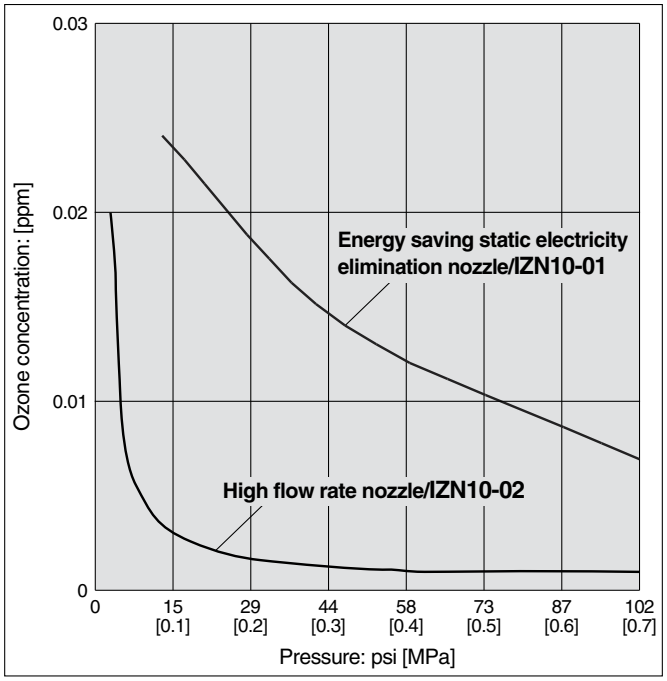


Fig. 1: Flow characteristics measuring circuit

Technical Data 3

Ozone Concentration

(1) Energy saving static electricity elimination nozzle/IZN10-01
(2) High flow rate nozzle/IZN10-02



Note) Ozone condensation can increase in an enclosed space.
Check the ozone condensation of the operating environment before using.

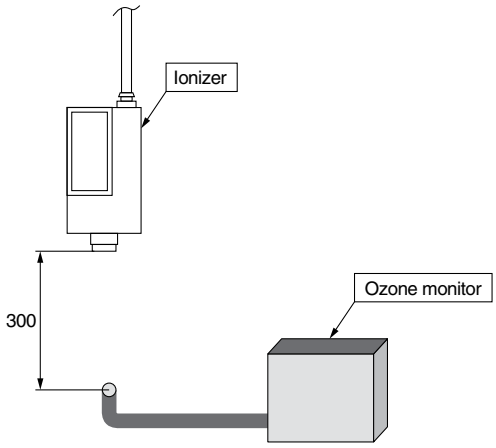


Fig. 2: Ozone condensation measuring circuit

Ionizer

Series IZN10

How to Order

IZN10 – 01 P 06 □ – □ – □

High frequency AC nozzle type

Nozzle type

Symbol	Type	
01	Energy saving static electricity elimination nozzle	
02	High flow rate nozzle	
11	Female threads for piping Note)	Rc1/8

Note) Nozzle shape: When using the female thread for the piping, connect the fitting and the tube or nozzle to the female thread.

Output specification

Nil	NPN output
P	PNP output

Port size

06	ø6: Metric size
07	ø6.35 (1/4): Inch size
16	ø6: Metric size (Elbow)
17	ø6.35 (1/4): Inch size (Elbow)

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
B1	With L-bracket
B2	With pivoting bracket
B3	With DIN rail mounting bracket

∗ Refer to page 41.

Made to Order

X194	Without electrode needle contamination detector

∗ Refer to the description below.

Made to Order

■ Without electrode needle contamination detector

How to Order	Contents/Specifications
IZN10 – 11 □ □ □ – □ – X194 ● Fill in the standard model type shown above. **Without electrode needle contamination detector**	With this specification, contamination detection signal is not generated when the pressure around the electrode needle increases due to tube piping etc. This specification is recommended when the tube needs to be extended. • The ion generating efficiency of the high frequency AC type ionizer will decrease when the pressure around the electrode needle reaches 15 psi (0.1 MPa) or more, due to its ion generating mechanism, and the contamination detection signal will be generated. However, in the range where the contamination detection signal is generated, a small amount of ions are still generated, so it can be used in some operating conditions.

■ Nozzle Variations (P.50)

Various nozzles are available according to the installation conditions or applications.
- Circular diffusion nozzle
- Flat diffusion nozzle
- Bar nozzle (straight type)
- Bender tube nozzle
- Circumferential jet bar nozzle (straight type)

■ Intermittent control timer (P.51)

It is possible to perform the intermittent ion blow through the ON/OFF control of the valve, etc.

Accessories

Bracket

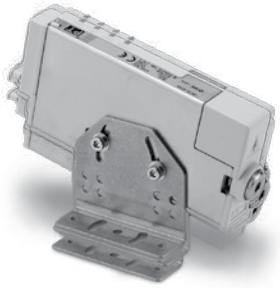
• L-bracket/IZN10-B1

Fixed mounting

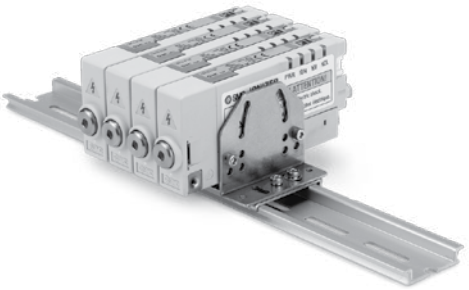
Pivot mounting

• Pivoting bracket/IZN10-B2

• DIN rail mounting bracket/IZN10-B3



Single unit



Manifold*

* The L-bracket and the DIN rail mounting bracket can be used with the manifold.

Power supply cable

[Standard length]
• IZN10-CP (3 m)
• IZN10-CPZ (10 m)

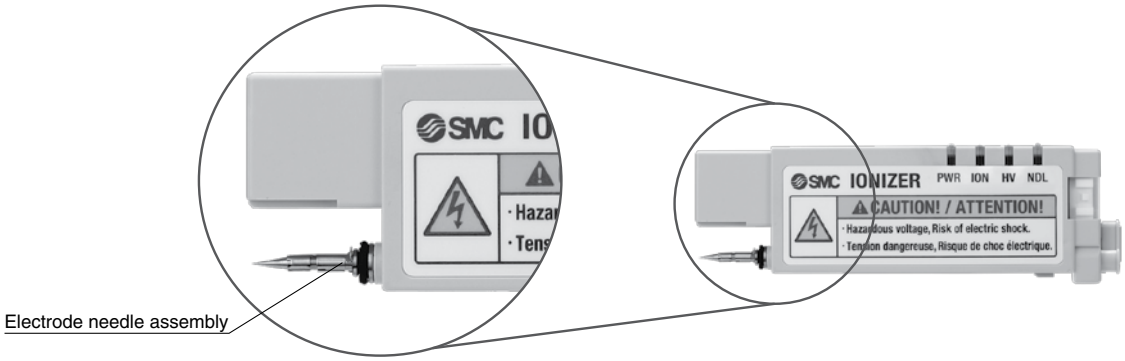
[Non-standard length]
• IZN10-CP 01 -X13

Cable length

01	1m
02	2m
⋮	⋮
20	20m

Repair Parts

Electrode needle assembly/IZN10-NT



Body assembly: IZN10-A002- 01 06

Nozzle type

Symbol	Type
01	Energy saving static electricity elimination nozzle
02	High flow rate nozzle
11	Female threads for piping Rc1/8

Port size

06	ø6: Metric size
07	ø6.35 (1/4): Inch size
16	ø6: Metric size (Elbow)
17	ø6.35 (1/4): Inch size (Elbow)

Cartridge assembly: IZN10-A003-□

Output Type

Nil	NPN output
P	PNP output

Options

Manifold mounting parts set

This set consists of a hexagon socket head cap screw, spacer and hexagon nut.

Note) The ionizer, L-bracket and DIN rail mounting bracket need to be prepared separately.

How to Order

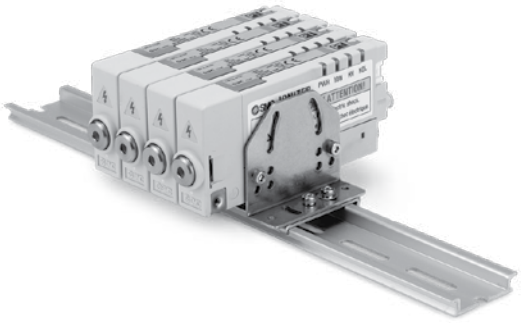
IZN10-ES□

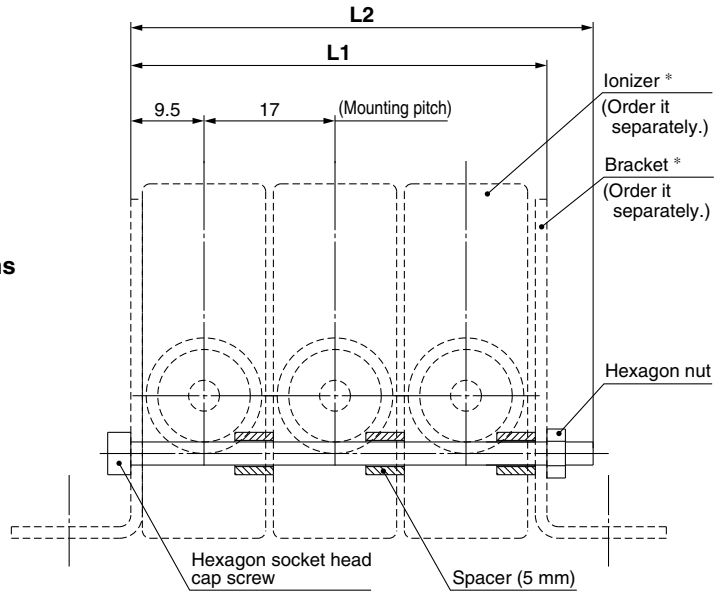
Mounting pitch

Symbol	Pitch
ES	17 mm

Mounting stations

Symbol	Stations
2	2
3	3
4	4





* Prepare two brackets and ionizer separately.

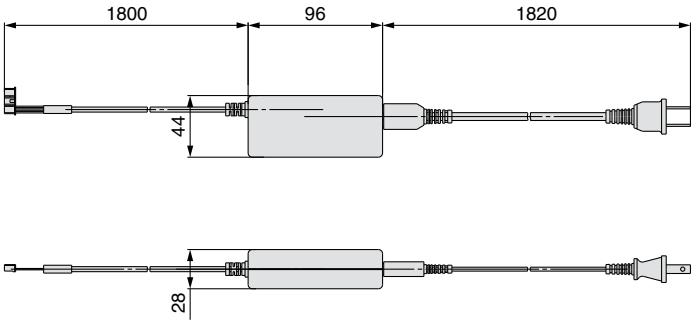
Part no.	L1	L2	Number of spacers
IZN10-ES2	37	40	4
IZN10-ES3	54	60	6
IZN10-ES4	71	75	8

How to Order

AC adapter/IZN10-F□-X196

Output signal specifications

Nil	For NPN output
P	For PNP output



Electrode needle cleaning kit/IZS30-M2

Specifications

Ionizer model		IZN10-□□ (NPN specification)	IZN10-□□P (PNP specification)
Ion generation method		Corona discharge type	
Method of applying voltage		High frequency AC type	
Discharge output Note 1)		2.5 kVAC	
Ion balance Note 2)	**Energy saving static electricity elimination nozzle**	Within ±10 V	
	High flow rate nozzle	Within ±15 V	
Ozone generation Note 3)		0.03 ppm (0.05 ppm for energy saving static electricity elimination nozzle)	
Air purge	**Fluid**	Air (Clean dry air)	
	Operating pressure Note 4) Note 5)	7.3 to 102 psi (0.05 MPa to 0.7 MPa)	
	Connecting tube size	ø6, ø1/4 inch	
Power supply voltage		24 VDC ±10%	
Current consumption		80 mA	
Input signal	**Discharge stop signal**	Connected to GND (ON voltage: 0.6 V or less) Current consumption: 5 mA or less	Connected to +24 V (ON voltage: Between +19 V and power supply voltage) Current consumption: 5 mA or less
	Reset signal		
	External switch signal		
Output signal	**Discharge signal**	Max. load current: 40 mA Residual voltage: 1 V or less (load current at 40 mA) Max. applied voltage: 28 VDC	Max. load current: 40 mA Residual voltage: 1 V or less (load current at 40 mA)
	Error signal		
	Maintenance signal		
Effective static electricity elimination distance		20 mm to 500 mm	
Ambient and fluid temperature		32 to 131°F (0 to 55°C)	
Ambient humidity		35 to 65%Rh	
Material		Housing: ABS, Stainless steel Nozzle: Stainless steel Electrode needle: Tungsten	
Vibration resistance		Durability: 50 Hz, Amplitude: 1 mm, XYZ each 2 hours	
Shock resistance		10 G	
Weight		120 g	
Standards/Directive		CE (EMC Directive: 2004/108/EC)	

Note 1) Measured with a probe of 1000 MΩ and 5 pF.

Note 2) Measured with a distance of 100 mm between the charged object and ionizer at an air purge pressure of 44 psi (0.3 MPa).
For the static electricity elimination time, refer to technical data on page 36.

Note 3) Value above background level, measured with a distance of 300 mm from the front of the nozzle at an air purge pressure of 44 psi (0.3 MPa).

Note 4) Static electricity cannot be eliminated without air purge.
Also, failure of air purge can increase internal ozone condensation, adversely affecting the ionizer and peripheral equipment. Be sure to perform air purge while energizing the ionizer.
When the air purge is stopped temporarily during operation of the ionizer, the discharge is stopped with the discharge stop signal input turned OFF to avoid increase in internal ion concentration.

Note 5) Nozzle shape: The operating pressure upper limit of the female thread for the piping (IZN10-11□□□-□) may vary depending on the mounting material. Since the ion generation efficiency decreases if the pressure around the electrode needle is 15 psi (0.1 MPa) or more as described in Note 1) on page 36, check the static electricity elimination performance with the mounting material to be used and use the nozzle at a pressure level that maintains the static electricity elimination performance.

Functions

1. Electrode needle contamination detection

Detects lowered static electricity elimination performance due to contamination or wear of the electrode needle. The maintenance LED lights up and maintenance signal is generated.

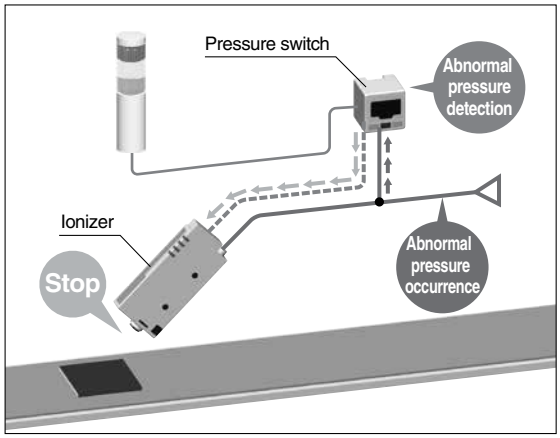
2. Signal inputs by external switch

There are 2 ports for external switch signal inputs.

Example

Emission of static electricity is suspended when abnormal purge air pressure is detected by pressure switch.

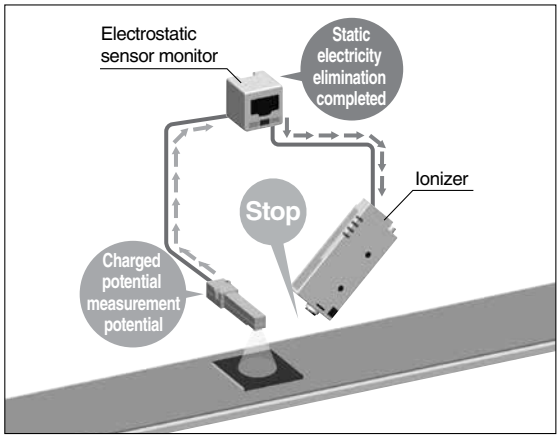
- Prevents static electricity elimination trouble due to pressure drop of compressed air.



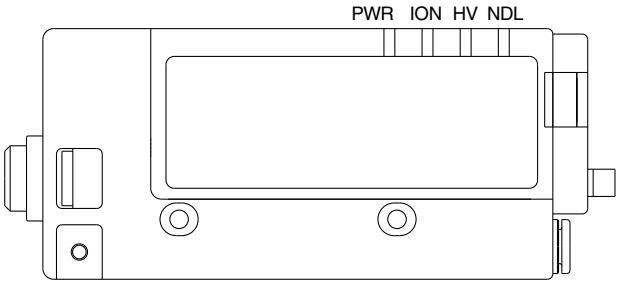
Example

An electrostatic meter is connected to stop discharge when static electricity elimination is completed.

- Energy can be saved by stopping discharge when static electricity elimination is completed.



3. Description of LEDs



Description	Symbol	Color	Contents
Power supply display	PWR	Green	Lights up when the power supply is turned on.
Discharge	ION	Green	Lights up when static electricity is discharged.
Irregular high voltage display	HV	Red	Lights up when an irregular current flows on an electrode needle.
Maintenance display	NDL	Orange	Lights up when electrode needle contamination is detected.

Behavior of LEDs

Items	PWR	ION	HV	NDL	Note
Normal operation (with discharge stop signal on)	○	○			Ions are being generated.
Normal operation (with discharge stop signal off)	○				Discharge stops.
Abnormal high voltage detected	○		○		Discharge stops when error is detected.
External switch signal 1	○				Discharge stops when the signal is turned on.
External switch signal 2	○				
Electrode needle contamination detected	○	○		○	Ions keep being generated even after the contamination is detected.

4. Alarm

Alarm item	Description	Corrective actions
High voltage error	Gives notification of the occurrence of an irregular current, such as high-voltage leakage. The ionizer stops discharging, turns on the HV LED. When error occurred, the signal output is turned off.	Turn off the power, solve the problem, then turn the power on again. If the error is solved during operation, turn the reset signal off and then on.
Maintenance electrode needle	Gives notification that electrode needle maintenance is necessary. The NDL LED turns on and a maintenance output signal is turned on.	Turn off the power, clean the electrode needles, and turn the power on again.

Wiring

No.	Cable color	Description	I/O	Wiring requirement Note)	I/O	Specifications
1	Brown	Power supply +24 V	–	○	–	–
2	Blue	Power supply GND	–	○	–	–
3	Orange	Discharge stop signal	Input	○	Input	When the signal is turned off, discharge stops.
4	Pink	Reset signal	Input		Input	When the signal is turned on and then off, the error signal is reset. When the signal is turned off, normal operation continues.
5	White	Discharge signal	Output		Output	The signal stays on during discharge
6	Purple	Error signal	Output		Output	The signal is turned off when an error occurs
7	Yellow	Maintenance signal	Output		Output	The signal is turned on when maintenance is due.
8	Gray	External switch signal 1	Input		Input	When the signal is turned on, discharge stops.
9	Light blue	External switch signal 2	Input		Input	When the signal is turned on, discharge stops.

Note) **Wiring requirement**
○: Minimum wiring requirement for ionizer operation.

• Input signal

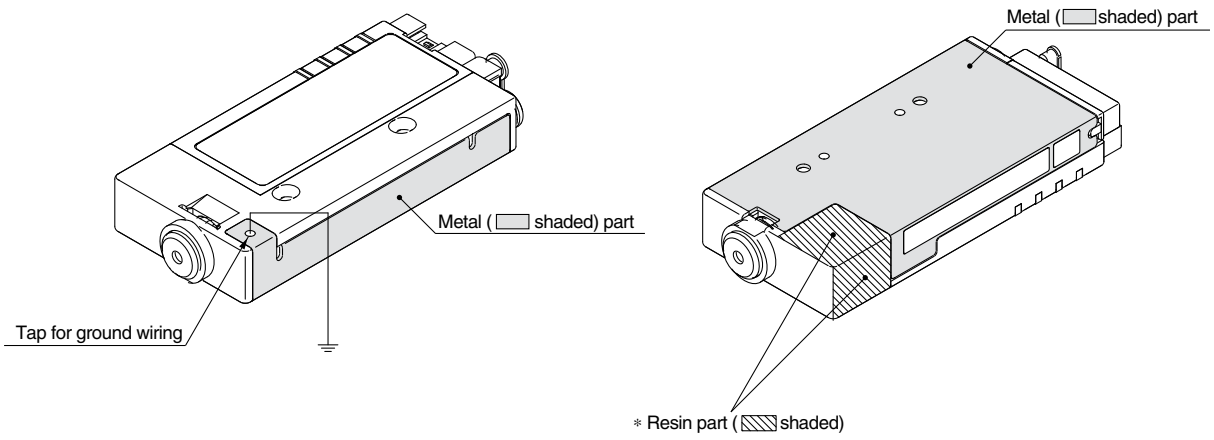
NPN: The signal is turned on when the power supply GND is connected, and turned off when disconnected.
PNP: The signal is turned on when the power supply 24 V is connected, and turned off when disconnected.

• Output signal

NPN: The signal is turned on when the output transistor is energized (by the power supply GND inside the ionizer), and turned off when de-energized.
PNP: The signal is turned on when the output transistor is energized (by the 24 V power supply inside the ionizer), and turned off when de-energized.

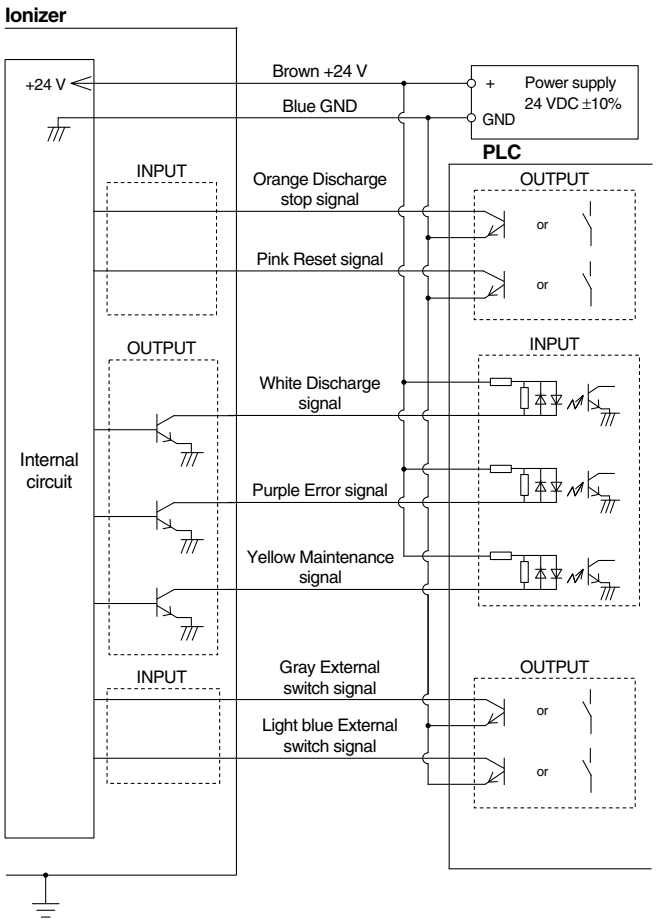
Provide Grounding.

1. Ground the tap for ground wiring or metal (shaded) parts around the external face of the ionizer with a resistance of 100 Ω or less.
   If grounding is not provided or is incomplete, the ionizer will not be able to achieve its specified static electricity elimination performance. Also, the maintenance signal will be generated.
2. If the product is used under the conditions that the pressure around the electrode needle becomes 15 psi (0.1 MPa) or more depending on the piping conditions stated in Note 1) on page 36, avoid to mount the grounded base or workpiece on the resin part (shaded) at locations marked with an asterisk shown in the Fig. below. If the grounded base or workpiece is mounted on the resin part (shaded) under these operating conditions, the ozone concentration around the high-voltage generation substrate inside the ionizer chassis increases, causing the substrate to break. For details about the dimensions of the resin part (shaded), refer to the dimensions on page 47.



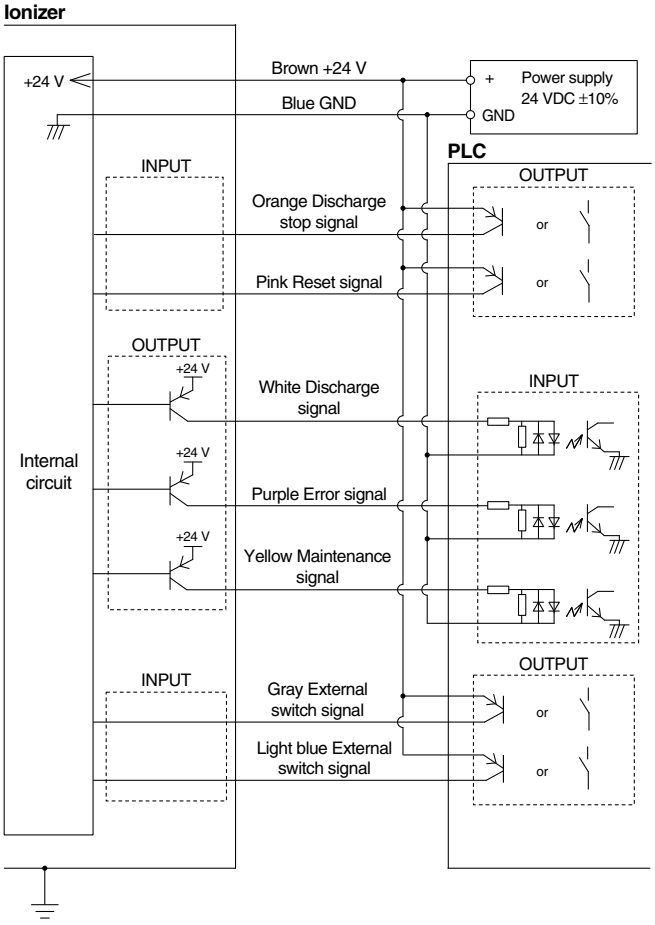
Power Supply Cable Connection Circuit

■ **NPN**



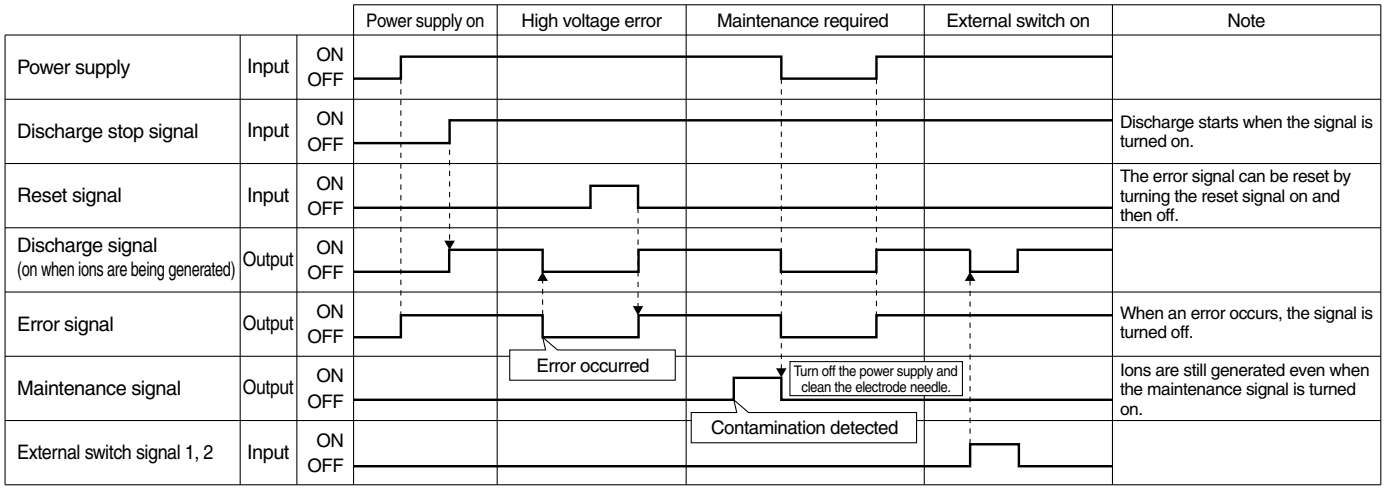
Class D grounding to external metal parts
(no electrical connection to internal circuit)

■ **PNP**



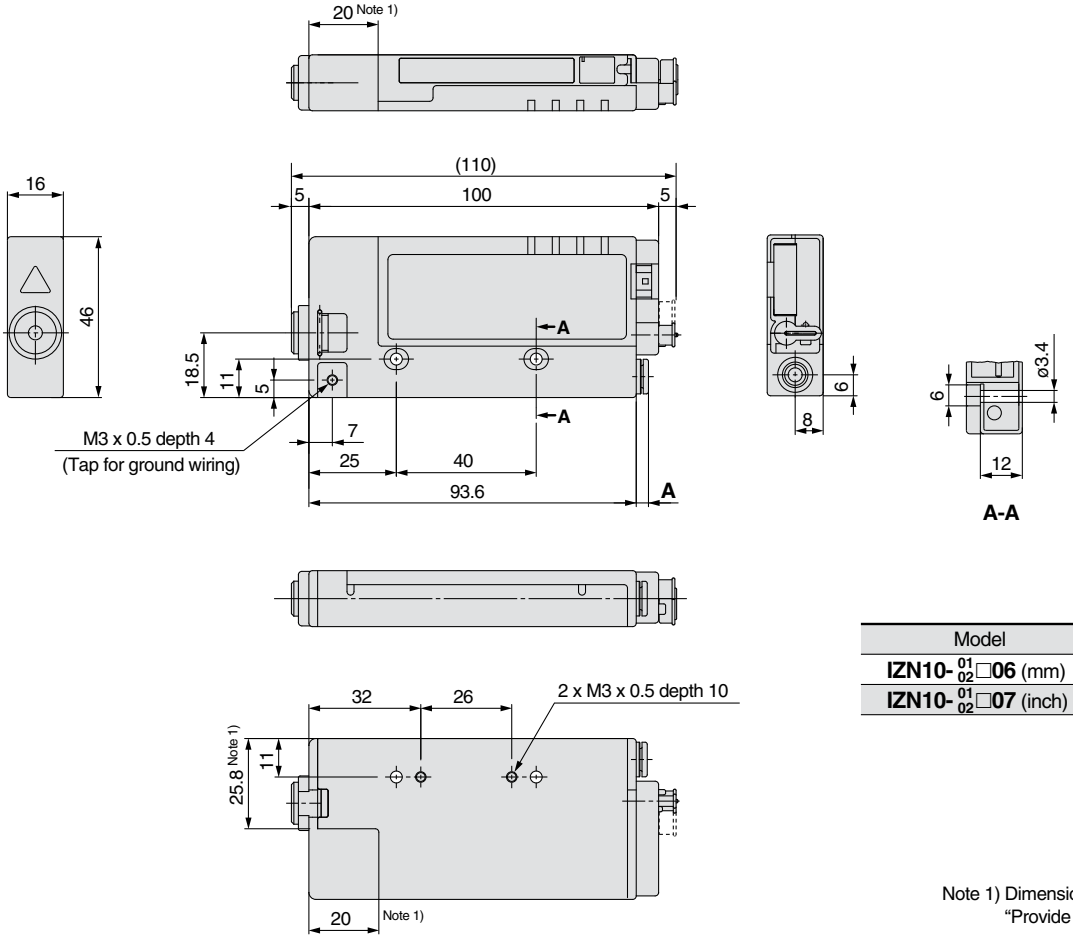
Class D grounding to external metal parts
(no electrical connection to internal circuit)

Timing Chart



Dimensions

Energy saving static electricity elimination nozzle/IZN10-01□ 06 07
High flow rate nozzle/IZN10-02□ 06 07

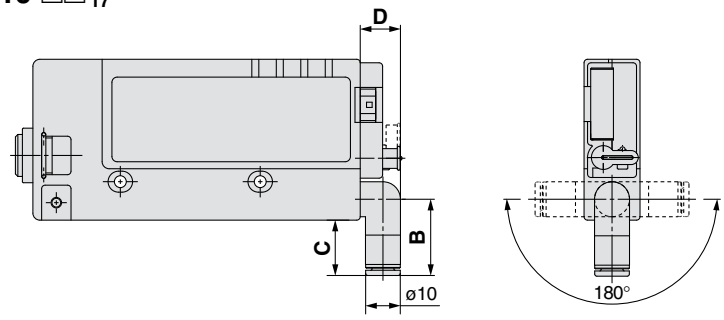


(mm)

Model	A
IZN10-$^{01}_{02}$□06 (mm)	3.5
IZN10-$^{01}_{02}$□07 (inch)	7

Note 1) Dimensions of the resin part stated in "Provide Grounding" on page 45.

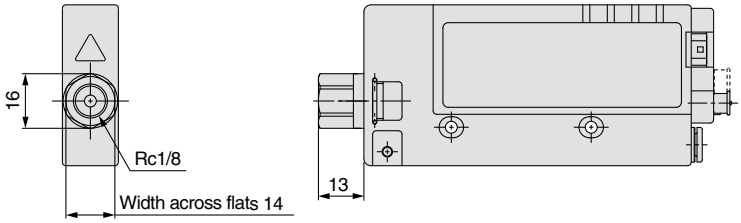
Elbow for piping port/IZN10-□□ 16 17



(mm)

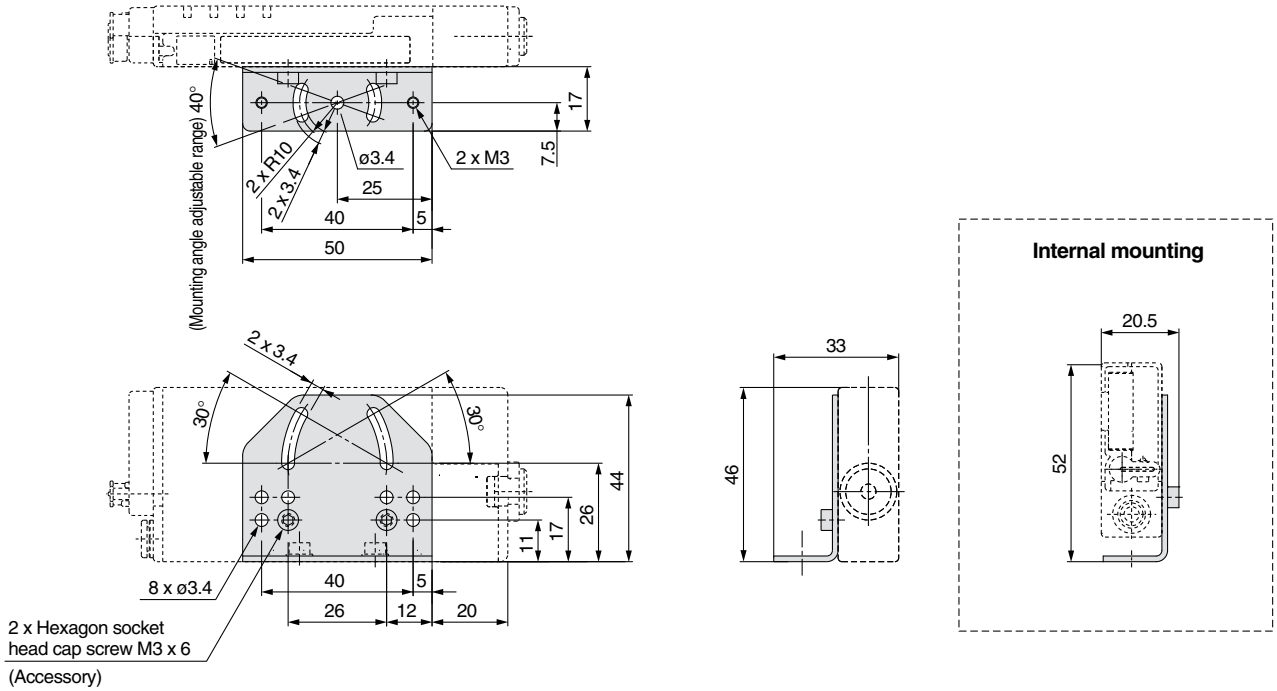
Model	B	C	D
IZN10-□□16 (mm)	22	16	11.5
IZN10-□□17 (inch)	24.5	18.5	12

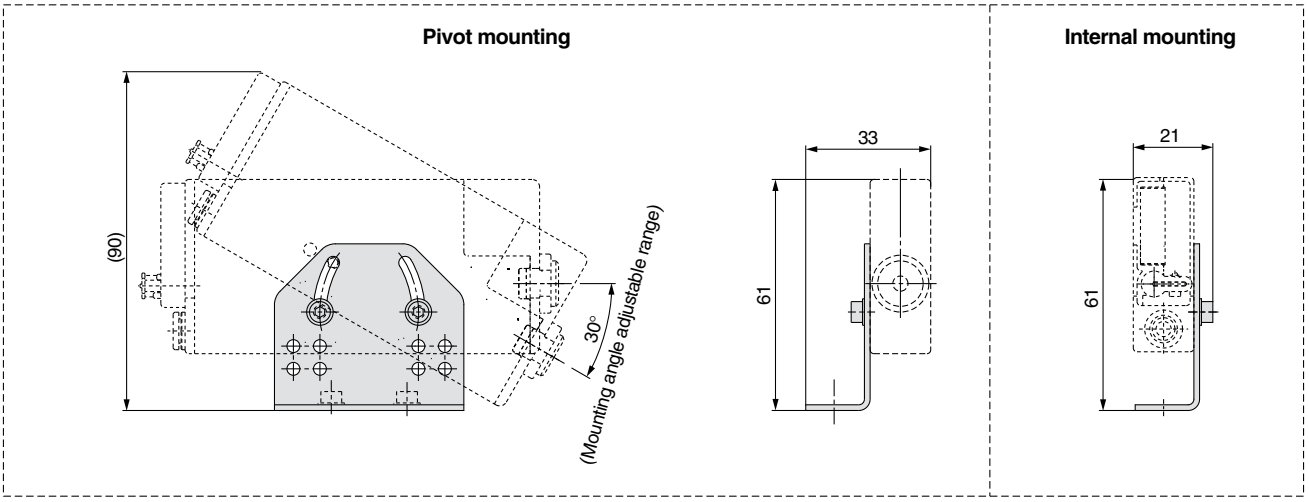
Female threads for piping (Rc1/8)/IZN10-11□□



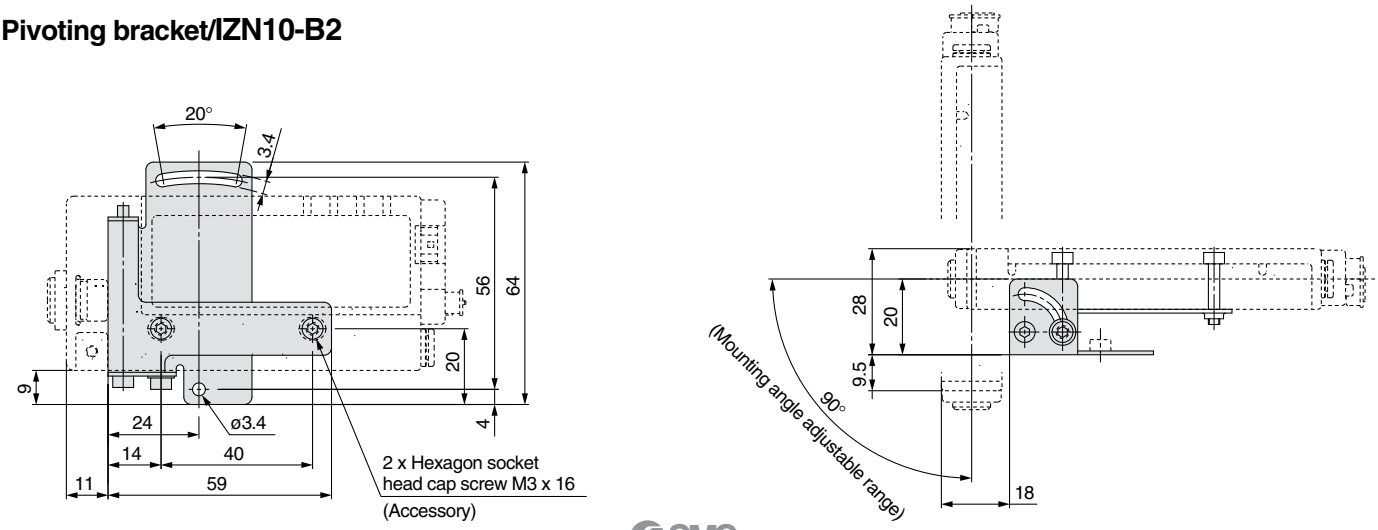
Dimensions

L-bracket/IZN10-B1



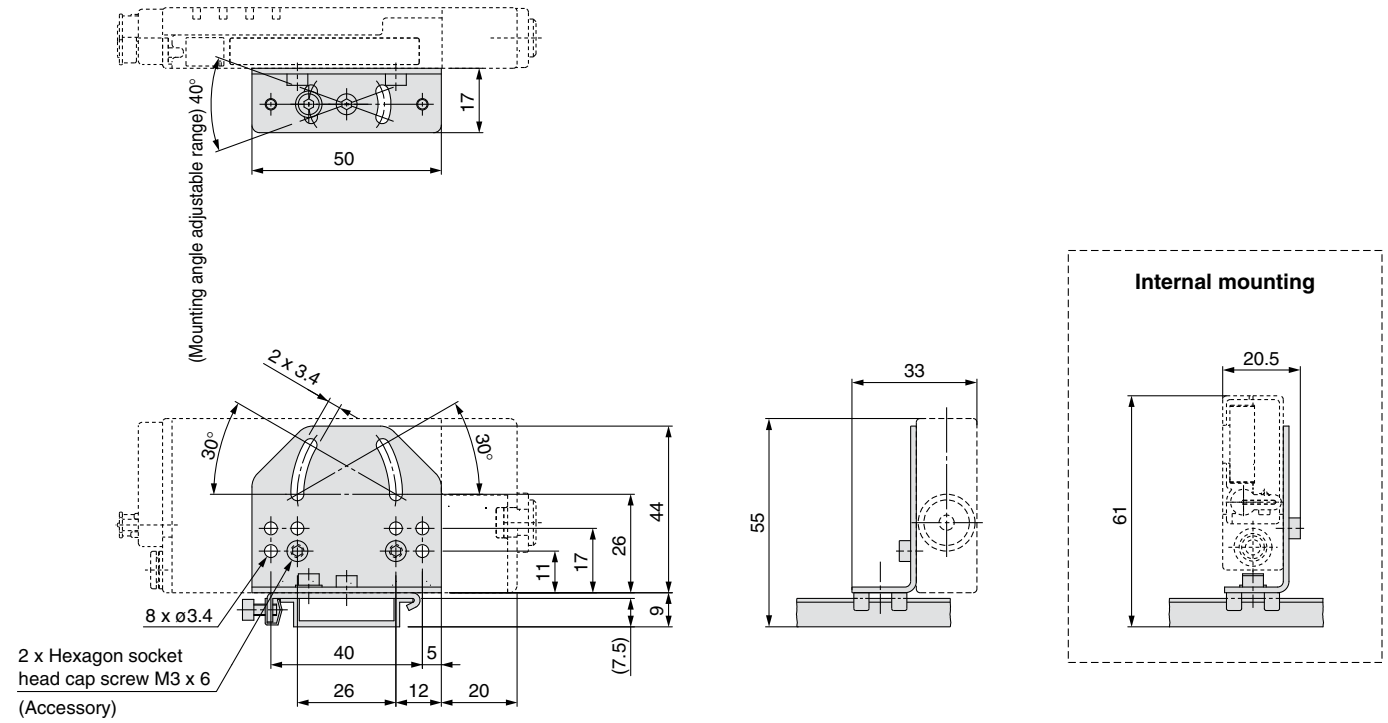


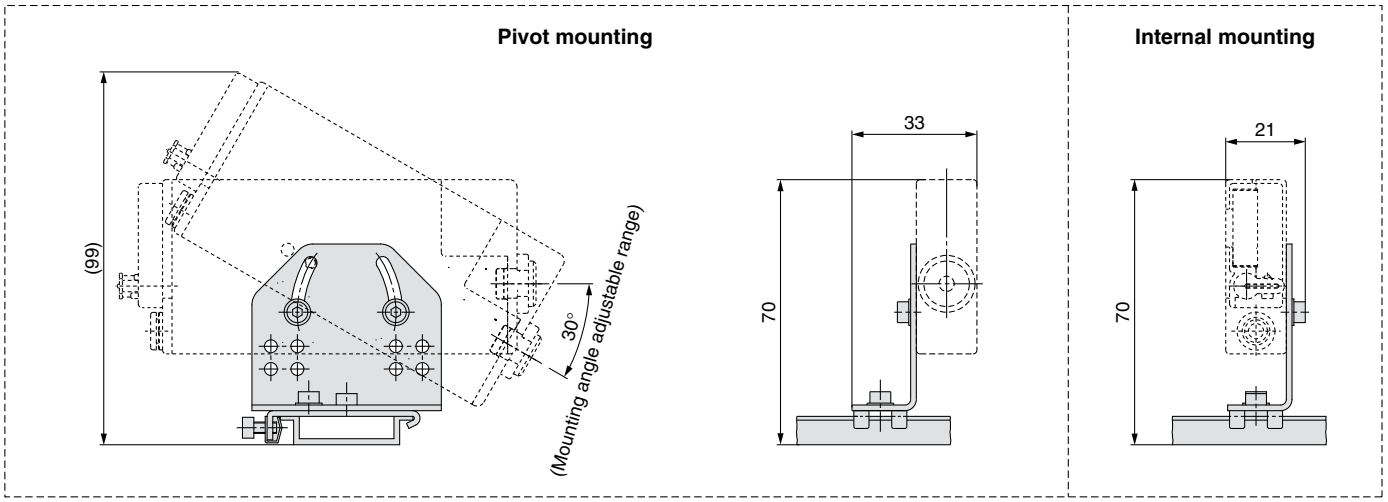
Pivoting bracket/IZN10-B2



Dimensions

DIN rail mounting bracket/IZN10-B3





Series *IZN10*
Made to Order 1

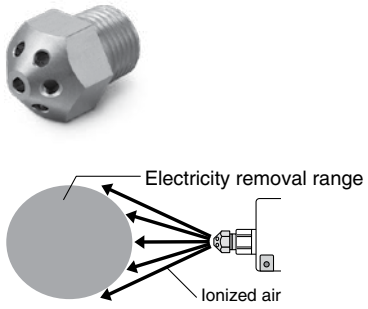
Made to Order

This product is an individually applicable product. For details about the delivery time and price, please consult with SMC representative.

Nozzle Variations

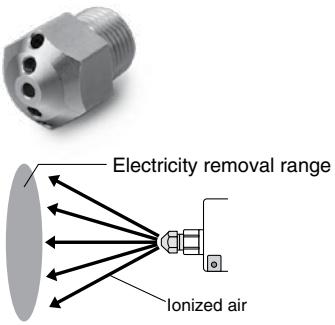
For details, refer to the product catalog available on SMC website.

Circular diffusion nozzle



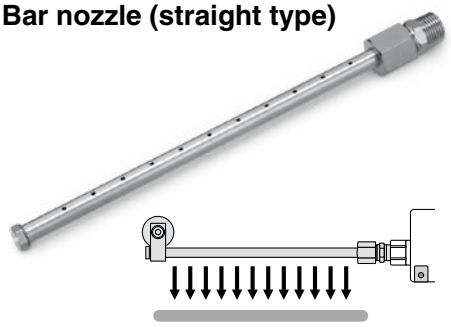
Part no.
IZN10-G-X198

Flat diffusion nozzle



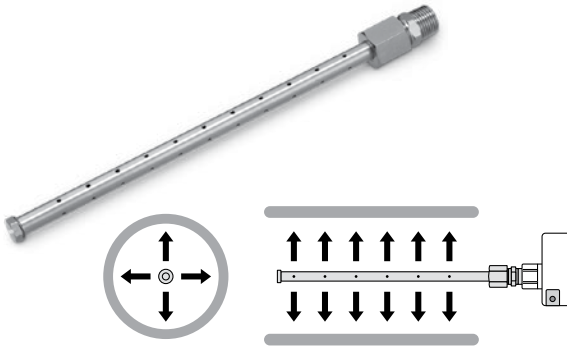
Part no.
IZN10-G-X199

Bar nozzle (straight type)



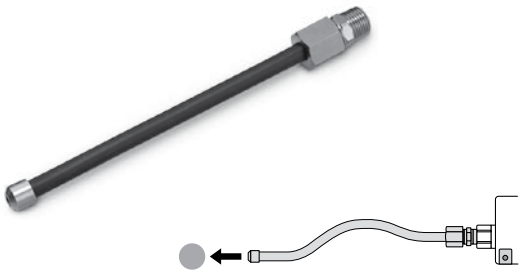
Part no.	Bar length (mm)
IZN10-G-100-X216	100
IZN10-G-200-X216	200
IZN10-G-300-X216	300
IZN10-G-400-X216	400
IZN10-G-500-X216	500
IZN10-G-600-X216	600

Circumferential jet bar nozzle (straight type)



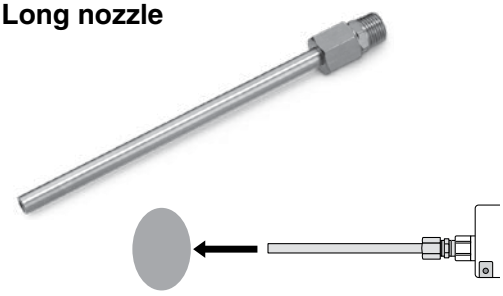
Part no.	Bar length (mm)
IZN10-G-X278	150

Bender tube nozzle



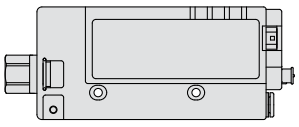
Part no.	Bar length (mm)
IZN10-G-100-X205	100
IZN10-G-200-X205	200
IZN10-G-300-X205	300
IZN10-G-400-X205	400
IZN10-G-500-X205	500
IZN10-G-600-X205	600

Long nozzle



Part no.	Bar length (mm)
IZN10-G-100-X226	100
IZN10-G-200-X226	200
IZN10-G-300-X226	300
IZN10-G-400-X226	400
IZN10-G-500-X226	500
IZN10-G-600-X226	600

For the ionizer, please select a female thread type (Rc1/8) for the piping.
(Refer to “How to Order” for page 40.)



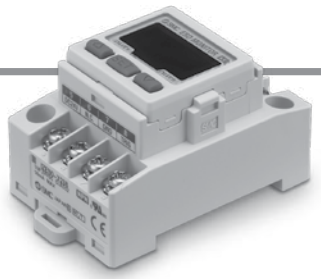
IZN10-11□□

Series IZN10
Made to Order 2

This product is an individually applicable product. For details about the delivery time and price, please consult with SMC representative.

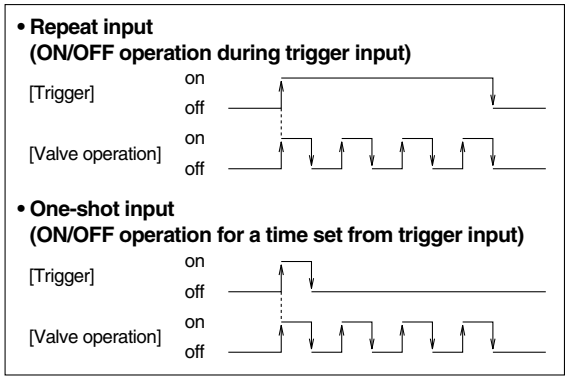
Made to Order

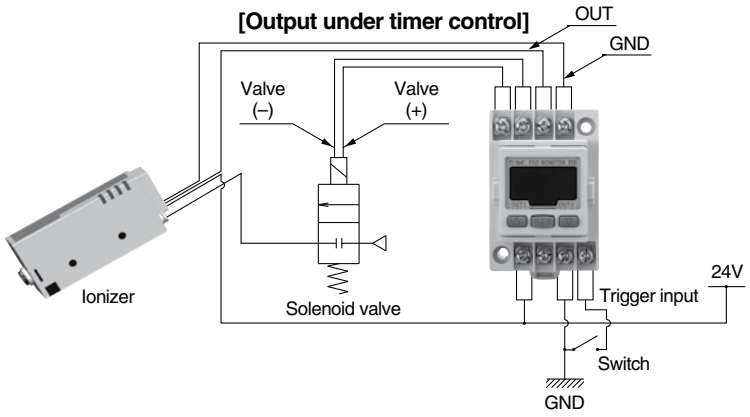
Intermittent control timer



A digital timer that can control ON/OFF switches of valves etc.
Application: Improved dust removal effect under low air consumption by intermittent ion blowing

- **Changeable frequency 0.1 to 50.0 Hz**
- **Set individual ON and OFF times 0.1 to 99.9 seconds**
- **Display of accumulated number of changes**
  It can be used for maintaining valve or cylinder operation.
- **Switch output (Output under timer control)**
- **2 types of trigger input**





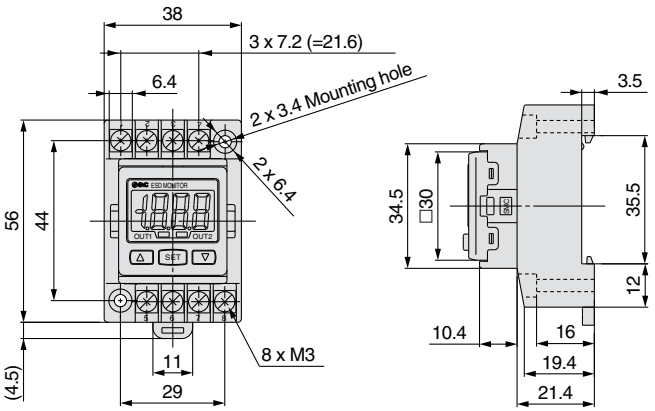
- **Solenoid valves up to 24 VDC (4W) etc. are controllable.**

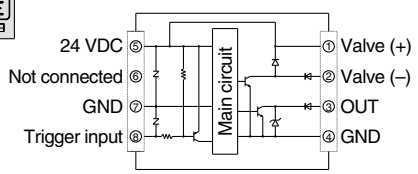
Specifications

Model		IZE110-X238
Power supply voltage		24 VDC±10% (with power supply polarity protection)
Current consumption		50 mA or less (Single unit only)
Connection valve		24 VDC 4 W or less
OUT Note)	**Max. load current**	80 mA
	Max. applied voltage	30 VDC
	Residual voltage	1 V or less (At load current 80 mA)
	Short circuit protection	With short circuit protection
Trigger input		No-voltage input, Low level input 10 ms or more, Low level 0.4 V or less
Indicator light		(Green/Red)
Environmental resistance	**Enclosure**	IP40
	Operating temperature range	Operating: 0 to 50°C, Stored: –10 to 60°C (with no freezing or condensation)
	Operating humidity range	Operating/Stored: 35 to 85% RH (with no condensation)
	Withstand voltage	1000 VAC for 1 minute between terminals and housing
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter), between terminals and housing
	Vibration resistance	10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 20 m/s² acceleration, in X, Y, Z direction for 2 hrs. each (De-energized)
	Impact resistance	100 m/s² in X, Y, Z directions 3 times each (De-energized)
Material		Front case: PBT, Rear case: Denaturated PPE
Weight		50 g

Note) Do not use a load that generates surge voltage.

Dimensions/Input/Output circuit





Input/Output circuit

SMC

Series IZN10
Specific Product Precautions 1

Be sure to read this before handling. Refer to back cover for Safety Instructions.

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 cover), please consult with SMC beforehand.

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

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

3. Use clean compressed air for fluid.

This product is not explosion proof. Never use a flammable gas or an explosive gas as a fluid and never use this product in the presence of such gases.
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 a malfunction, wire breakage, fire or air leakage.

Minimum bending radius: Power supply cable……35 mm

(Note: Shown above is wiring with the fixed minimum allowable bending radius and at a temperature of 68°F (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. If the ionizer is to be mounted directly, mount it on a flat face.

If the mounting face is curved, distorted and/or uneven, excessive force will be applied to the ionizer, which may cause damage and failure of the ionizer. Also, dropping or exposing the ionizer to other strong impact may cause failure or accident.

Mounting

⚠Warning

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

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

4. Observe the tightening torque requirements when installing the ionizer. Refer to the following table for tightening torques for screws, etc.

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

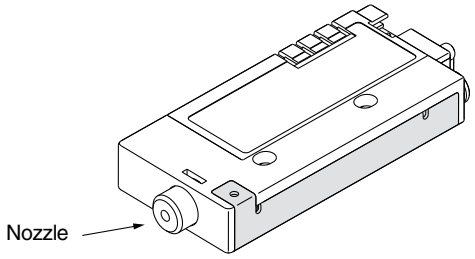
Thread size	Recommended tightening torque
M3	0.45 to 0.46 lbf·ft (0.61 to 0.63 N·m)

5. Do not allow foreign matter or tools to enter the nozzle.

The inside of the nozzle contains electrode needles. If a metal tool makes contact with the electrode needles, it can cause electric shock, resulting in a sudden movement by the operator that can cause further injuries such as hitting the body on peripheral equipment. Also, if the tool damages the electrode needle, the ionizer may fail or cause an accident.

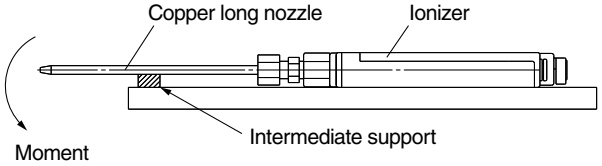
⚠Danger High Voltage!

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 apply moment to the nozzle.

If a copper long nozzle is mounted horizontally, moment will be applied to the nozzle. Then if vibration occurs, the nozzle can be damaged. If a moment of 0.037 lbf·ft (0.05 N·m) or more will be applied, mount a support to the middle part of the nozzle so that the moment is not applied to the nozzle.



7. Do not affix any tape or seals to the main unit.

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

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

Specific Product Precautions 2

Be sure to read this before handling. Refer to back cover for Safety Instructions.

Wiring/Piping

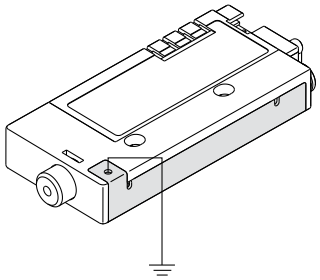
⚠ Warning

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

2. Always use a UL listed Class 2 output 24 VDC power supply.

3. Be sure to ground with a resistance of 100 Ω or less to maintain the product performance.

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



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

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

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

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

8. Be sure to confirm there are no wiring errors before starting this product.

Incorrect wiring will lead to damage or malfunction to the product.

9. Flush the piping before using.

Before using this product, exercise caution to prevent particles, water drop, or oil from entering the piping.

Operating Environment/Storage Environment

⚠ Warning

1. 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.

Also, ozone condensation can increase if used in an enclosed space, which can affect the human body, so ventilation is necessary. Even if ventilation is secured, the use of two more ionizers in a narrow space can increase ozone condensation. Therefore, check that ozone condensation is not more than a standard value of 0.1 ppm in the operating environment while the ionizer is in operation.

Operating Environment/Storage Environment

⚠ Warning

2. Take preventative measures against ozone.

Equipment used around the ionizer should have ozone-prevention measures.

Also, regularly check that there is no deterioration due to ozone.

3. The ionizer cannot be used without air purge.

Without air purge, not only will the ionizer be unable to eliminate charge, but also the internal ozone condensation will increase and adversely affect the ionizer and peripheral equipment. Therefore, be sure to perform air purge when energizing the ionizer.

4. Observe the fluid and ambient temperature range.

Fluid and ambient temperature ranges are 32 to 131°F (0 to 55°C) for the ionizer. 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.

5. 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 32 to 131°F (0 to 55°C).

b) Avoid using in a place that exceeds an ambient humidity range of 35 to 65% 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 the main body is electro-statically discharged.

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.

6. 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)

7. The ionizer is not designed to withstand lightning.

Specific Product Precautions 3

Be sure to read this before handling. Refer to back cover for Safety Instructions.

Maintenance

⚠ Warning

1. Periodically (for example, every two weeks) inspect the ionizer and clean the electrode needles.

Conduct a regular maintenance to see if the product is run having a disorder.
Maintenance should be conducted by a fully knowledgeable and experienced person about the equipment. Using for long periods of time will lower the static electricity eliminating performance, if particles attach to the electrode pin. When the maintenance signal LED lights up, clean the electrode needle.
Replace the electrode cartridge, if the pins are worn 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. The tube and fitting must be treated as consumable parts.

The tube and fitting that are connected to the female piping ports of the ionizer can deteriorate due to ozone and need to be replaced regularly or use an ozone-resistant type.

3. When cleaning the electrode pin or replacing the electrode cartridge, be sure to turn off the power supply to the main body.

Touching an electrode needle when it is electrified may result in electric shock or other accidents.

4. Do not disassemble or modify this product.

Otherwise, an electrical shock, damage and/or a fire may occur. Also, the disassembled or modified products may not achieve the performances guaranteed in the specifications, and exercise caution because the product will not be warranted.

5. Do not operate this product with wet hands.

Otherwise, an electrical shock or accident may occur.

Handling

⚠ Warning

1. Do not drop, bump or apply excessive impact (10 G or more) while handling.

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

2. When mounting/dismounting the cable, use your finger to pinch the claw of the modular plug, then attach/detach it correctly. Otherwise, modular plug mounting section may be damaged and cause a disorder.

Ionizer/Fan Type

Series IZF10

Compact fan type with simple functions

- **Compact design (H x W x D): 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**
- **With alarm function**

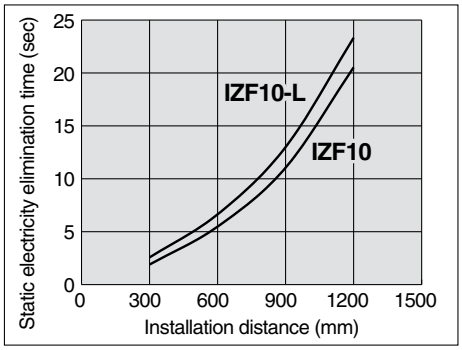
High-voltage error, electrode needle contamination detector

***Based on ANSI/ESD-STM3.1-2006 standards**

Specifications

Ionizer model	IZF10-□□	IZF10-L-□□	IZF10-P-□□	IZF10-LP-□□
Ion generation method	Corona discharge type (DC)			
Power supply voltage	24 VDC ±10%			
Output	NPN open collector output		PNP open collector output	
Air flow	0.66 m³/min	0.46 m³/min	0.66 m³/min	0.46 m³/min
Power consumption	6.1 W or less	3.7 W or less	6.6 W or less	4.8 W or less
Ambient temperature	Operation: 32 to 122°F (0 to 50°C), Storage: 14 to 140°F (–10 to 60°C)			
Ambient humidity	Operation, Storage: 35 to 80% RH (No condensation)			
Weight	280 g (With bracket: 360 g)			

Installation distance and static electricity elimination time* (1000 V → 100 V)



How to Order

IZF10 – □□ – □□

Fan type

Rapid static electricity eliminating fan	**Nil**	23.3 scfm (0.66 m³/min)
Low-noise fan	**L**	16.2 scfm 0.46 m³/min

Air flow

Output

Nil	NPN output
P	PNP output

Bracket

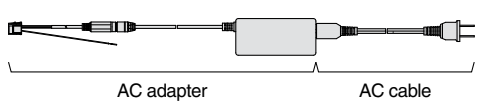
Nil	None
B	With bracket

Power supply cable

Nil	With power supply cable (3 m)
Z	With power supply cable (10 m)
H Note)	e-con connector
Q	AC adapter (with AC cable)
R	AC adapter (without AC cable)
N	None

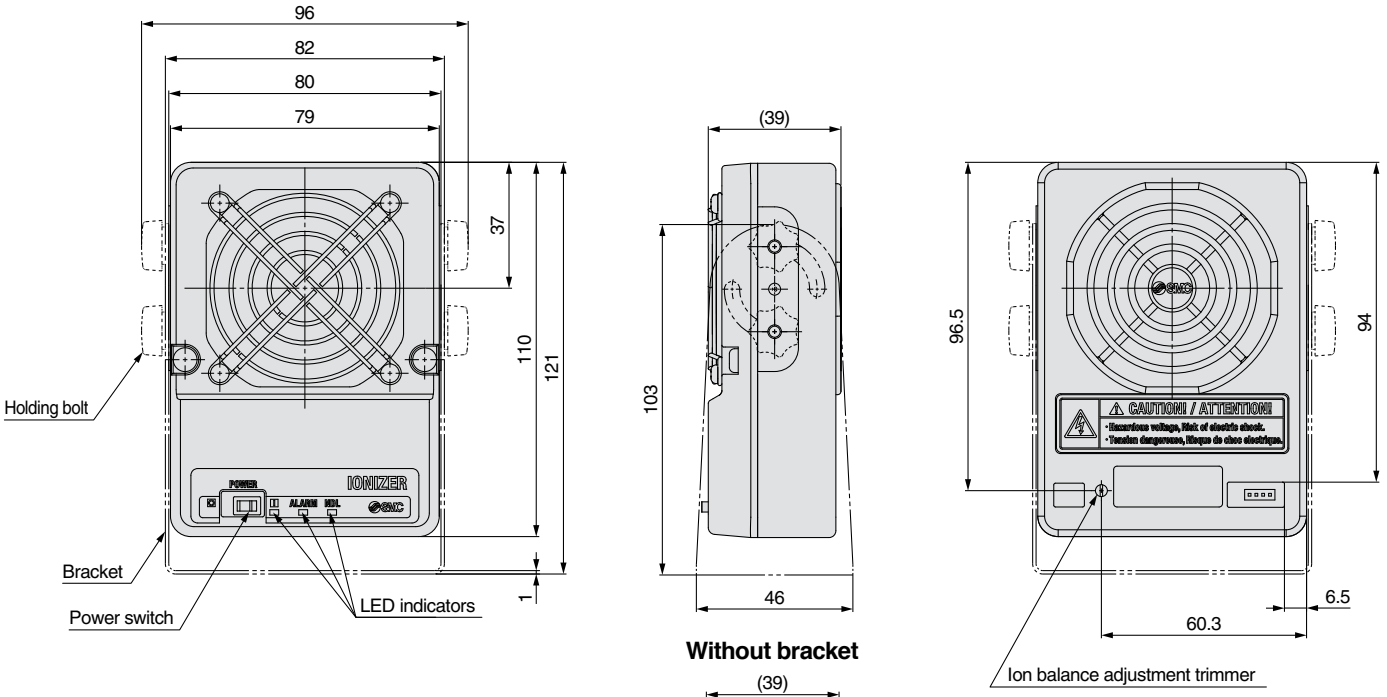
Note) The power supply cable option (H) is a supply connector for customers who have prepared a cable.

AC adapter

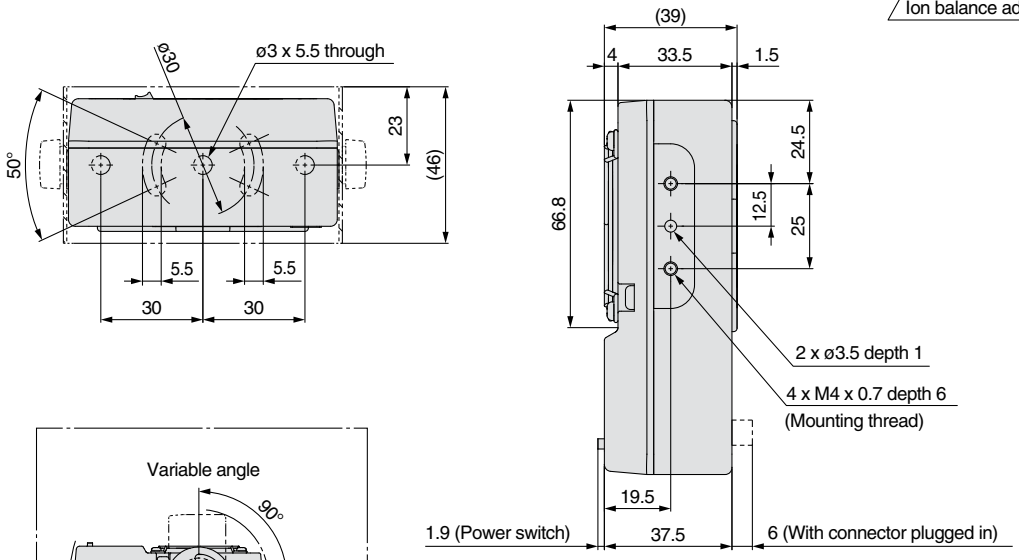


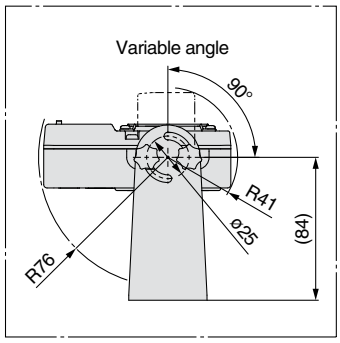
SMC

Dimensions



Without bracket

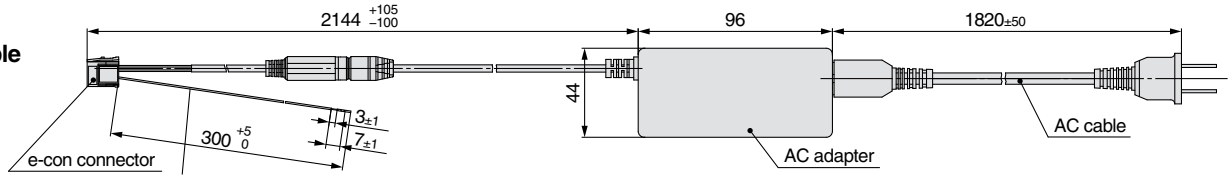




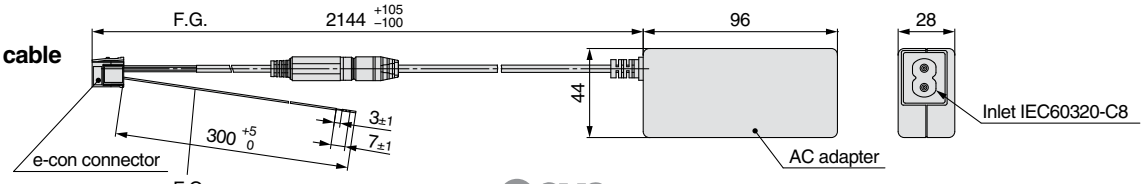
Wiring

Pin No.	Lead wire (color)	Description
1	Brown	24 VDC
2	Blue	GND
3	Green	F.G.
4	Purple	Emergency output

IZF10-CG1
With AC cable



IZF10-CG2
Without AC cable



Electrostatic Sensor

Series IZD10/IZE11

○ **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.**

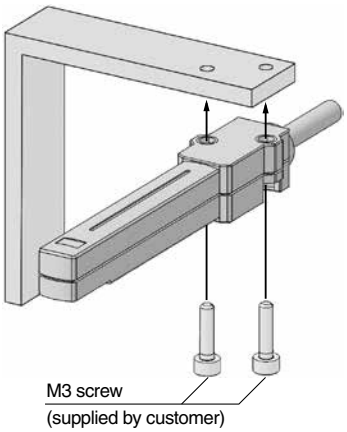
• Output voltage: 1 to 5 V (Output impedance: Approx. 100 Ω)

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

○ 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

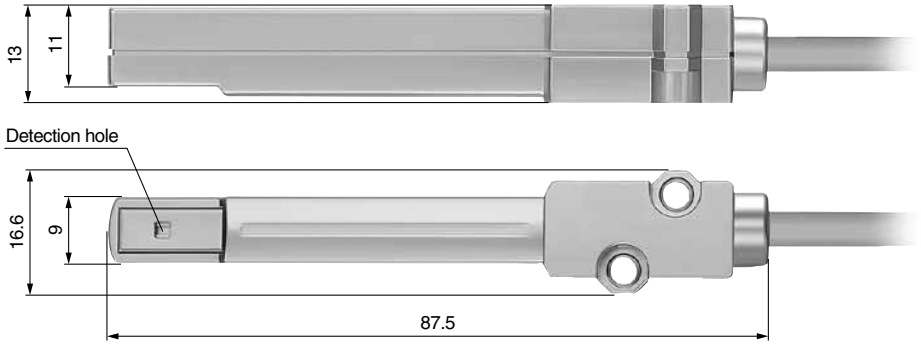
Electrostatic sensor monitor *Series IZE11*

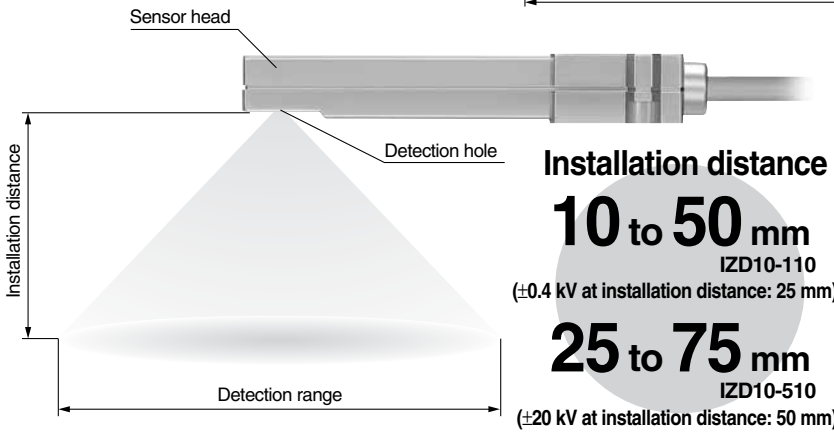
Electrostatic Sensor/Series IZD10



Small and easy to mount

Dimensions





Installation distance

10 to 50 mm
IZD10-110
(±0.4 kV at installation distance: 25 mm)

25 to 75 mm
IZD10-510
(±20 kV at installation distance: 50 mm)

Installation Distance and Detection Range

IZD10-110

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

IZD10-510

Installation distance (mm)	Detection range (mm)
25	100
30	120
40	150
50	180
60	205
70	225
75	235

Electrostatic Sensor Monitor/Series IZE11

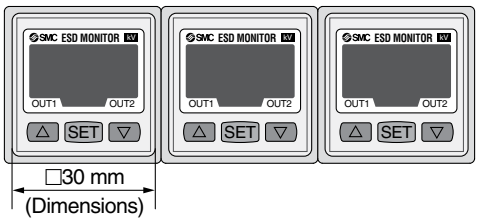
2-color display (Red/Green)

Able to set the display color in 4 patterns.

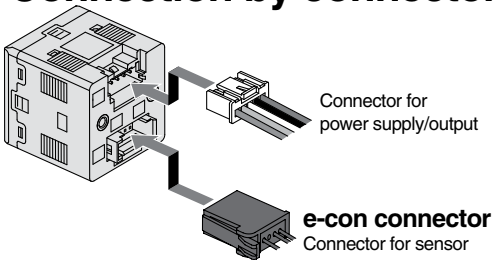
Pattern	ON	OFF
①	Red	Green
②	Green	Red
③	Red	Red
④	Green	Green

Mountable even with a sensor touched with each other

Possible to reduce panel fitting labor.



Connection by connector



Functions

- Detection distance correction
- Peak/Bottom value indication
- Keylock
- Zero-adjust
- Error display
- Switch output anti-chattering
- Selection of connection sensor

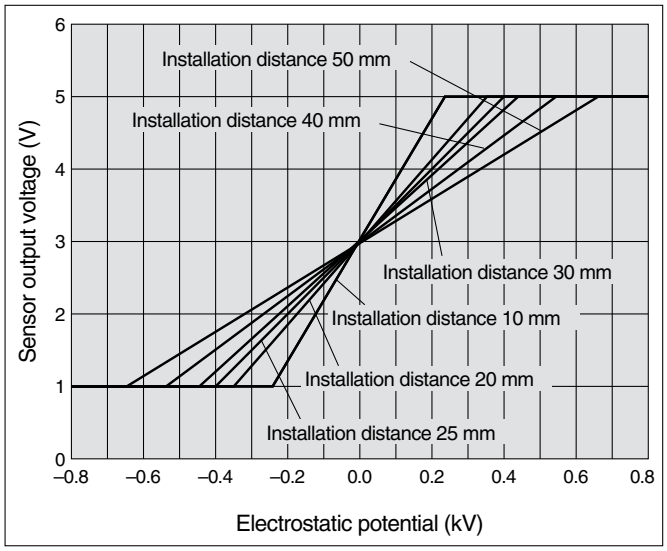
Technical Data

Output Signal

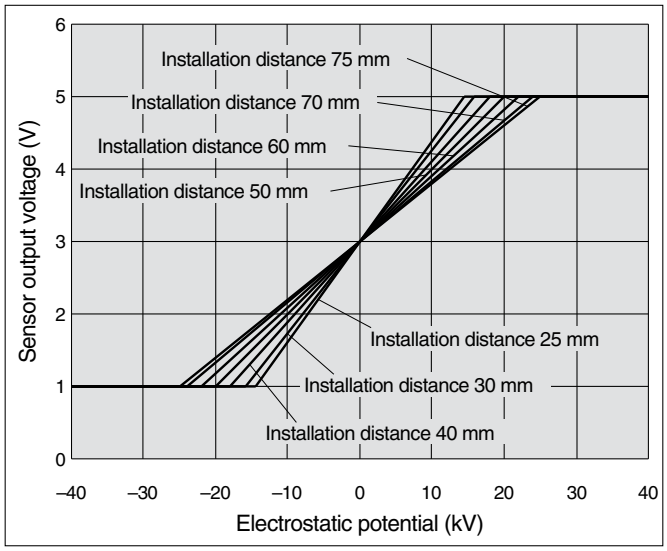
When measuring the potential of a charged object with an electrostatic sensor, the relationship between the electrostatic potential being measured and the output voltage varies depending on the sensor's installation distance. The relationship in the installation distance between the electrostatic sensor's output voltage and the detected electrostatic potential is as shown in the figure below: (The installation distance in the figure refers to the distance between the object being measured and the electrostatic sensor.)

Relationship in installation distance between electrostatic potential and sensor output voltage

IZD10-110

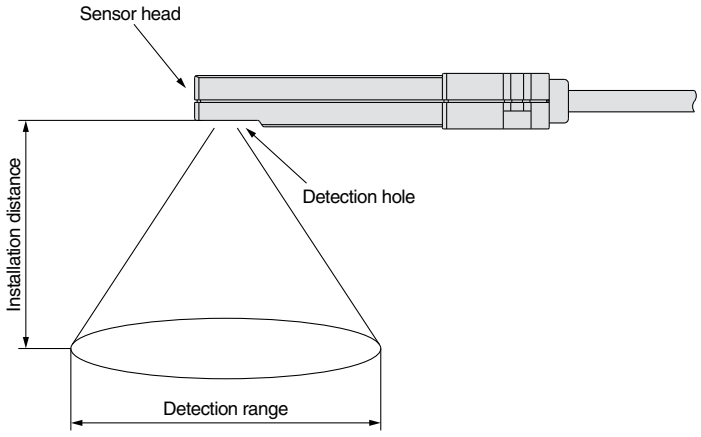


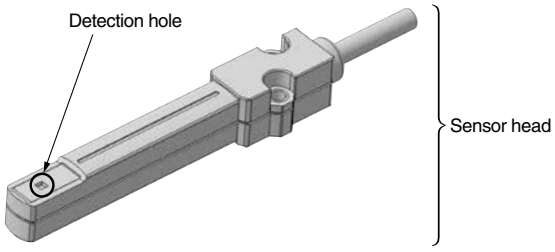
IZD10-510



Detection Range

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





IZD10-110
(Potential measurement: ±0.4 kV)

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

IZD10-510
(Potential measurement: ±20 kV)

Installation distance (mm)	Detection range (mm)
25	100
30	120
40	150
50	180
60	205
70	225
75	235

Electrostatic Sensor
Series IZD10

How to Order

IZD 10 — 1 10

Model

10	Electrostatic sensor

Potential measurement

1	±0.4 kV
5	±20 kV

Specifications

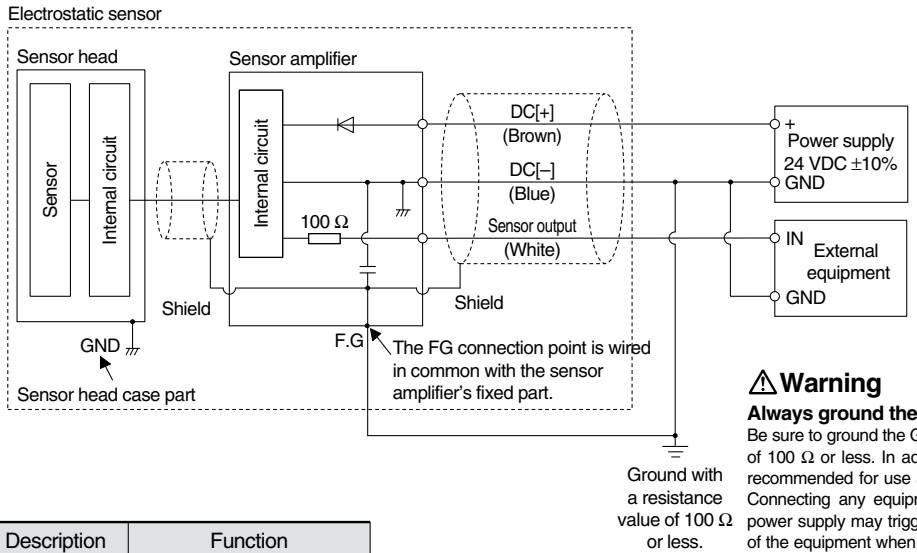
Model	IZD10-110	IZD10-510
Potential measurement	±0.4 kV (at detection distance: 25 mm)Note)	±20 kV (at detection distance: 50 mm)Note)
Output voltage	1 to 5 V (Output impedance: Approx. 100 Ω)	
Effective detection distance	10 to 50 mm	25 to 75 mm
Linearity	±5% F.S. (0 to 50°C, at detection distance: 25 mm)	±5% F.S. (0 to 50°C, at detection distance: 50 mm)
Output delay time	100 ms or less	
Power supply voltage	24 VDC ±10%	
Current consumption	40 mA or less	
Operating ambient temperature	32 to 122°F (0 to 50°C)	
Operating ambient humidity	35 to 85% Rh (with no condensation)	
Material	Head case: ABS Amplifier case: ABS	
Vibration resistance	Durability 50 Hz Amplitude 1 mm X, Y, Z each 2 hours	
Shock resistance	100 m/s^2	
Weight	185 g (including cable weight)	
Compliance with EN standards	Protective class: Class III (EN60950-1) Pollution Degree 3 CE marking: Low voltage directive: 2006/95/EC Only when connected to a SELV-type external circuit.	
EMC directive	2004/108/EC	
UL standards	UL508	

Note) The relationship between the measured potential and the output voltage varies depending on the detection distance.
For details on the relationship in the detection distance between the measured potential and the output voltage, refer to the graph in “Technical Data - Output Signal” on page 60.

Connection Circuit and Wiring Table

Connect the lead wires according to the following connection circuit and wiring table.

1. Connection circuit



2. Wiring table

Lead wire color	Description	Function
Brown	DC (+)	Power supply 24 VDC
Blue	DC (–)	Power supply 0 V
White	Sensor output	Analog output 1 to 5 V

⚠Warning

Always ground the electrostatic sensor.

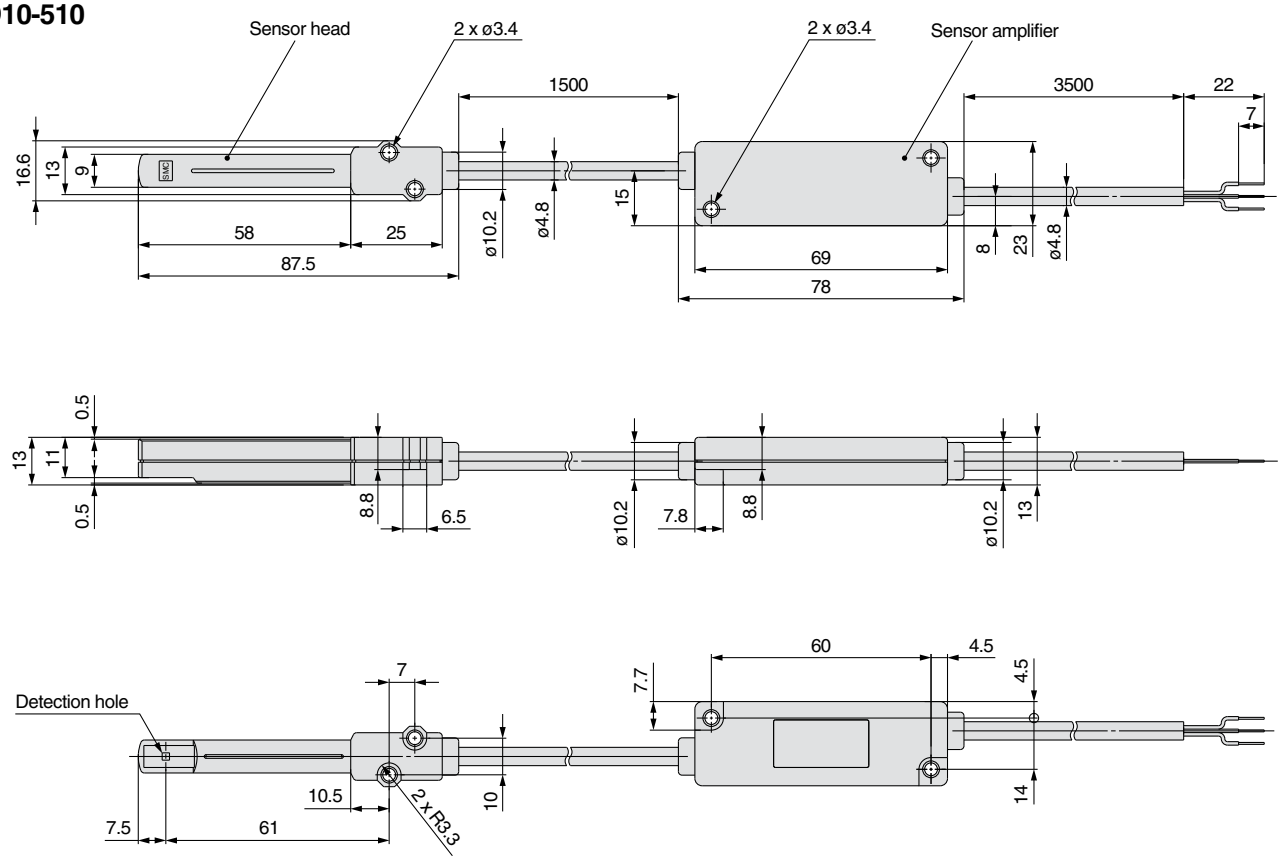
Be sure to ground the GND terminal with a resistance value of 100 Ω or less. In addition, a dedicated power supply is recommended for use as the sensor-driving power supply. Connecting any equipment other than the sensor to this power supply may trigger the malfunctioning or breakdown of the equipment when static electricity is discharged to the sensor head or when noise enters the GND terminal.

Note) When using the cable on the external equipment connection side after cutting it short, do not connect a shielding wire (since the shielded line is wired in common with the amplifier case, provide a frame ground on the amplifier case side).

∗ Text in ( ) refers to each lead wire coating color of the dedicated cable.

Dimensions

IZD10-110
IZD10-510



Electrostatic Sensor Monitor

Series IZE11

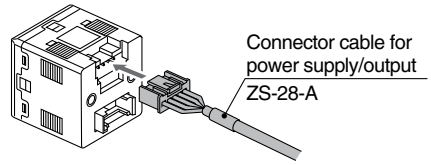
How to Order

IZE11 0 □ □ □

Input/Output specifications

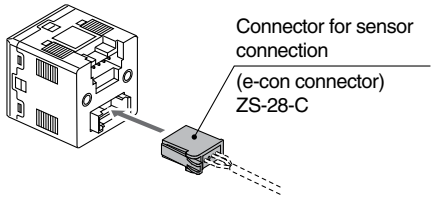
0	NPN open collector 2 outputs + Analog output 1-5 V
1	NPN open collector 2 outputs + Analog output 4-20 mA
2	PNP open collector 2 outputs + Analog output 1-5 V
3	PNP open collector 2 outputs + Analog output 4-20 mA

Option 1

Nil	None
L	Connector cable for power supply/output 

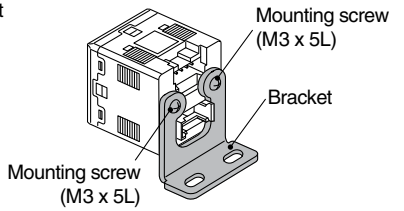
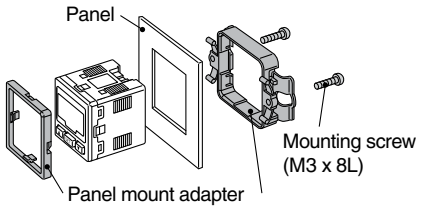
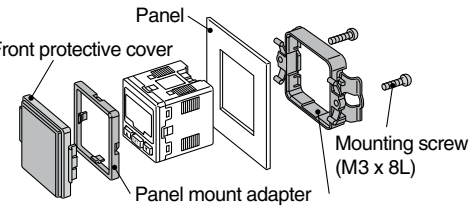
Note) The cable is not connected but packed together with product for shipment.

Option 3

Nil	None
C	With connector for sensor connection 

Note) The connector is not connected but packed together with product for shipment.

Option 2

Nil	None
A	Bracket 
B	Panel mount adapter 
D	Panel mount adapter + Front protective cover 

Note) The options are not attached but packed together with product for shipment.

Options/Part No.

Description	Part no.	Note
Connector cable for power supply / output (2 m)	ZS-28-A	
Bracket	ZS-28-B	With M3 x 5L (2 pcs.)
Connector for sensor connection	ZS-28-C	1 pc.
Panel mount adapter	ZS-27-C	With M3 x 8L (2 pcs.)
Panel mount adapter + Front protective cover	ZS-27-D	With M3 x 8L (2 pcs.)

Specifications

Model		IZE11□	
Connection sensor		IZD10-110	IZD10-510
Rated measurement range		–0.4 kV to +0.4 kV Note 1)	–20 kV to +20 kV Note 2)
Min. unit setting		0.001 kV	0.1 kV
Measurement distance setting		10 to 50 mm	25 to 75 mm
Power supply voltage		24 VDC ±10% or less (with power supply polarity protection)	
Current consumption		50 mA or less (excluding sensor unit's current consumption)	
Sensor input		1 to 5 VDC (Input impedance: 1 MΩ)	
	Number of inputs	1 input	
	Input protection	With excess voltage protection (up to 26.4 V)	
	Hysteresis	Hysteresis mode: Variable Window comparator mode: Variable	
Switch output		NPN or PNP open collector: 2 outputs	
	Max. load current	80 mA	
	Max. applied voltage	30 VDC (with NPN output)	
	Residual voltage	1 V or less (with load current of 80 mA)	
	Short circuit protection	With short circuit protection	
	Response time (including sensor response time)	100 ms or less Response time with anti-chattering function: 500 ms, 1 s, 2 s or less	
Analog output	**Voltage output**	Output voltage: 1 to 5 V (with rated pressure range), Output impedance: Approx. 1 kΩ	
	Accuracy (for readings) (77°F (25°C))	±1% F.S.	
	Current output	Output current: 4 to 20 mA (with rated pressure range) Max. load impedance: 600 Ω (at 24 VDC), Min. load impedance: 50 Ω	
	Accuracy (for readings) (77°F (25°C))	±1% F.S.	
	Response time (including sensor response time)	200 ms (without filter), 1.5 s (with filter) or less	
Display accuracy		±0.5% F.S. ±1 digit	
Display		3 + 1/2 digit, 7-segment indicator, 2-color display (Red/Green) Sampling cycle: 5 times/s	
Indicator light		OUT1: Lights up when output is turned ON (Green), OUT2: Lights up when output is turned ON (Red).	
Environment	**Enclosure**	IP40	
	Operating temperature range	Operating: 32 to 122°F (0 to 50°C), Stored: 14 to 104°F (–10 to 60°C) (with no freezing or condensation)	
	Operating humidity range	Operating/Stored: 35 to 85% RH (with no condensation)	
	Withstand voltage	1000 VAC for 1 minute between terminals and housing	
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing	
	Vibration resistance	10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s^2 acceleration, in X, Y, Z direction for 2 hrs. each (De-energized)	
	Impact resistance	100 m/s^2 in X, Y, Z directions 3 times each (De-energized)	
Temperature characteristics		±0.5% F.S. (77°F (25°C) reference)	
Connection method		Power supply, Output connection: 5-pin connector, Sensor connection: 4-pin connector	
Material		Front case: PBT, Rear case: PBT	
Weight (excluding power supply/output connection cable)		30 g	
Standards		CE marking, UL (CSA) compliant	

Note 1) Rated value when the distance between the charged object and the sensor is 25 mm
Note 2) Rated value when the distance between the charged object and the sensor is 50 mm

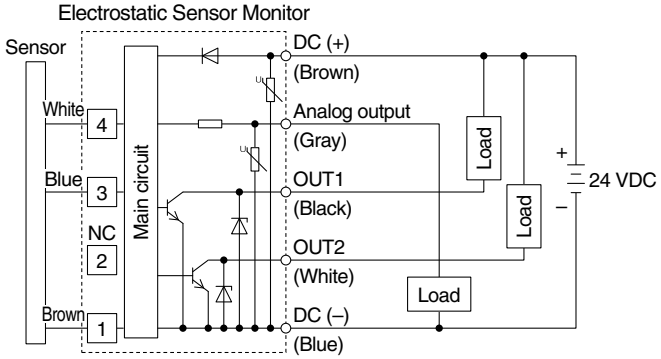
Example of Internal Circuit and Wiring

Output specifications

The wire colors (brown, black, white, gray and blue) shown in the circuit diagram apply when SMC's power supply and output connection cable (Part no.: ZS-28-A) are used.

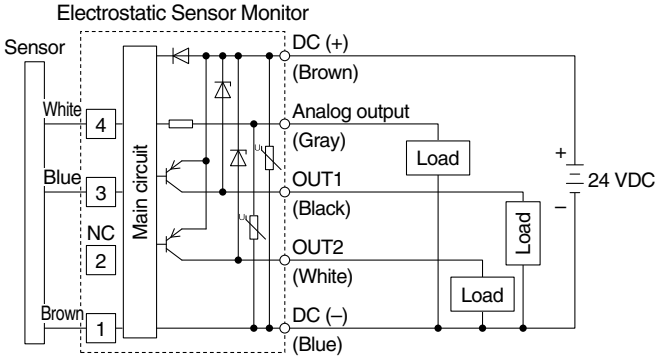
IZE110

NPN open collector output: 2 outputs
Max. 30 V, 80 mA
Residual voltage 1 V or less
Analog output: 1 to 5 V
Output impedance: Approx. 1 kΩ



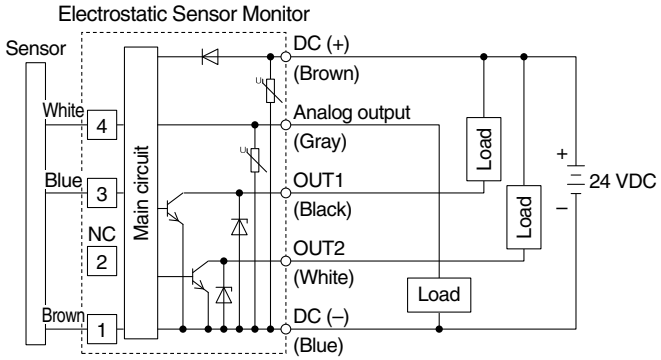
IZE112

PNP open collector output: 2 outputs
Max. 80 mA
Residual voltage 1 V or less
Analog output: 1 to 5 V
Output impedance: Approx. 1 kΩ



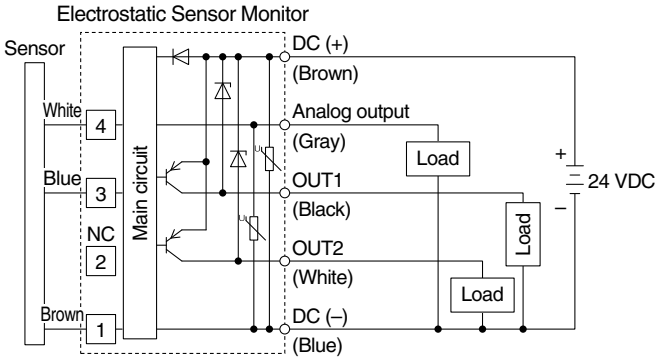
IZE111

NPN open collector output: 2 outputs
Max. 30 V, 80 mA
Residual voltage 1 V or less
Analog output: 4 to 20 mA
Max. load impedance: 600 Ω (24 VDC)
Min. load impedance: 50 Ω



IZE113

PNP open collector output: 2 outputs
Max. 80 mA
Residual voltage 1 V or less
Analog output: 4 to 20 mA
Max. load impedance: 600 Ω (24 VDC)
Min. load impedance: 50 Ω



Description

LCD display

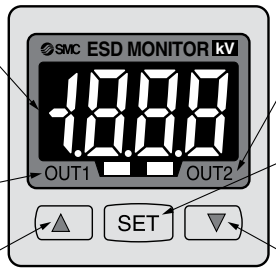
Shows the current electrostatic potential, set mode, and error code. Four display methods are available for selection, including an option for always displaying in a single color, red or green, and an option for switching from green to red in conjunction with the output.

Output (OUT1) display (Green)

Turns on when the OUT1 output is on.

▲ button

Use this button to change the mode or increase the ON/OFF set value. It also allows you to switch to the peak value display mode.



Output (OUT2) display (Red)

Turns on when the OUT2 output is on.

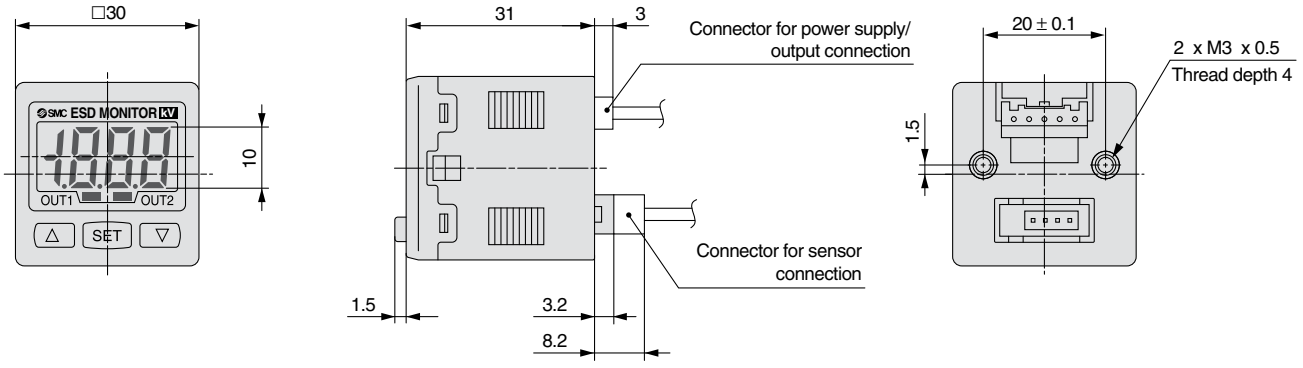
SET button

Use this button to switch the mode and set the set value.

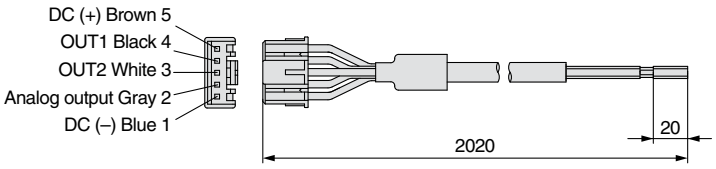
▼ button

Use this button to change the mode or decrease the ON/OFF set value. It also allows you to switch to the bottom value display mode.

Dimensions

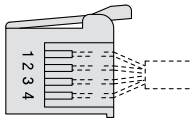


Connection cable for power supply/output (ZS-28-A)

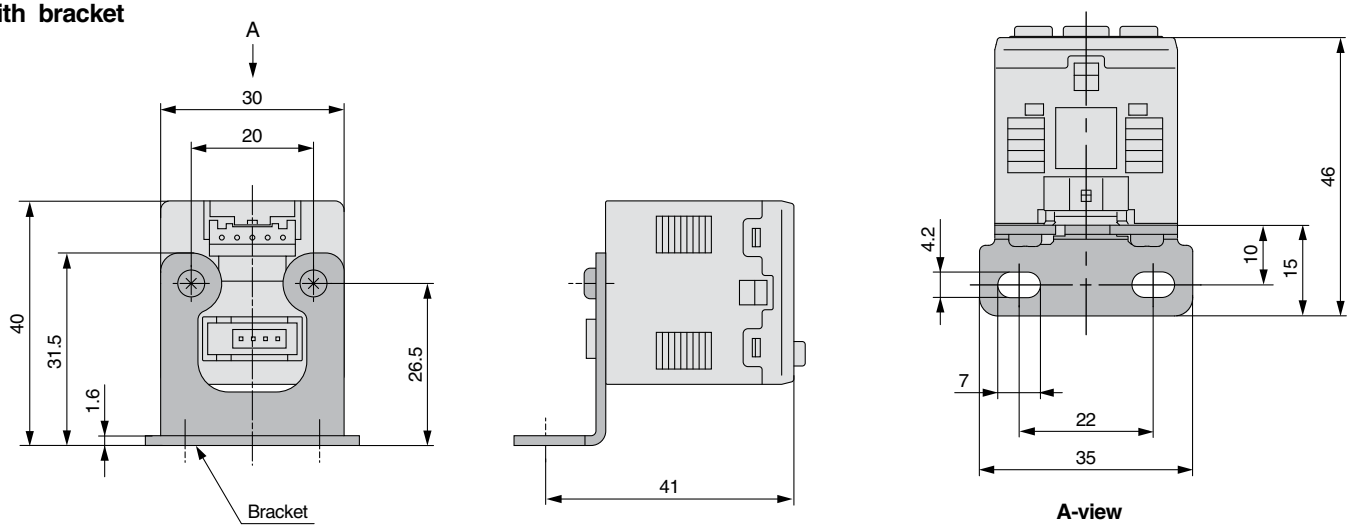


Connector for sensor connection

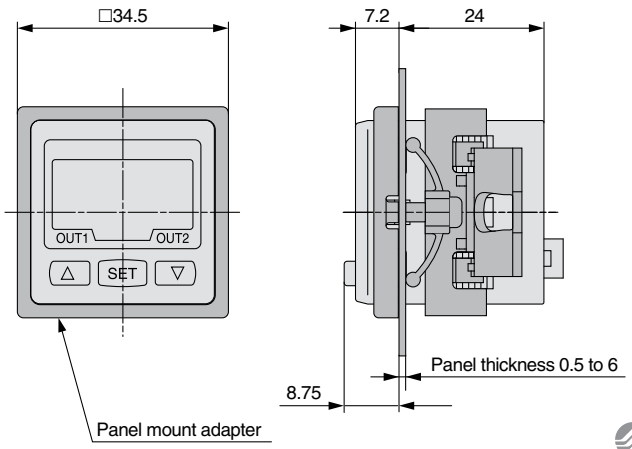
Pin no.	Terminal name
1	DC (+)
2	N.C.
3	DC (–)
4	IN (1 to 5 V)



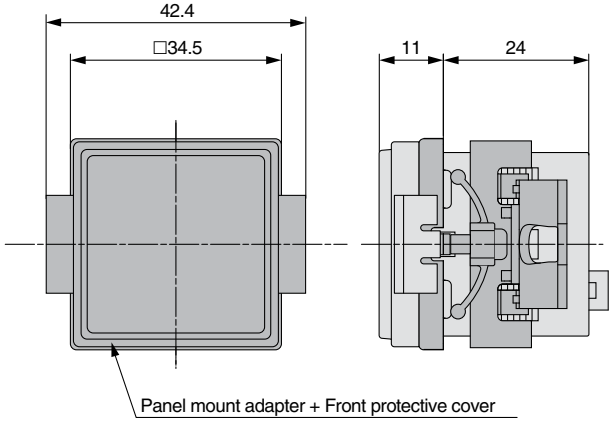
With bracket



With panel mount adapter



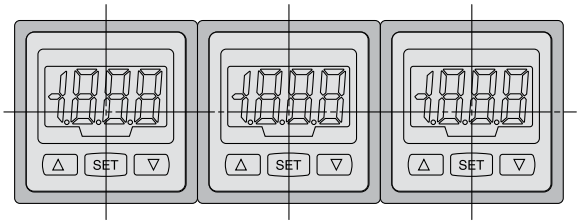
With panel mount adapter + Front protective cover



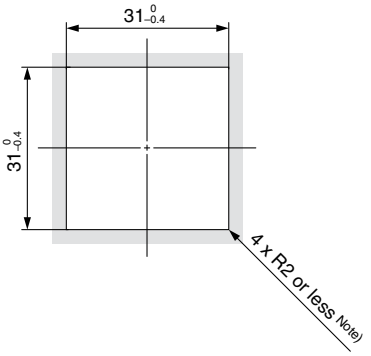
Dimensions

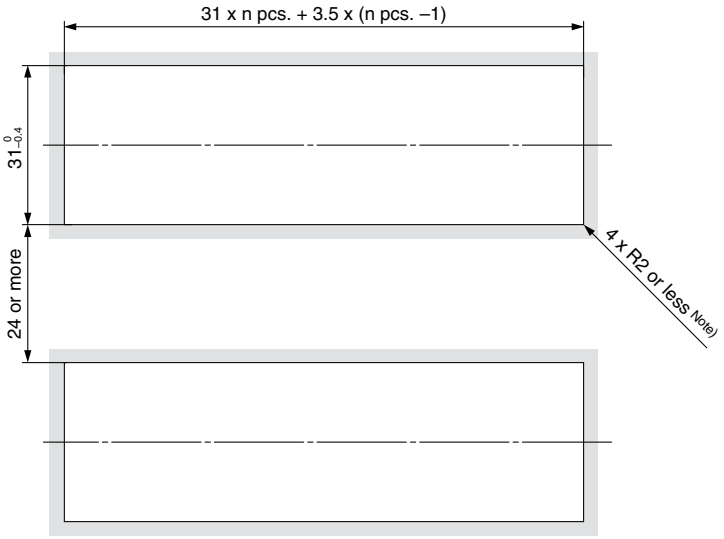
Panel fitting dimensions ∗ Panel thickness: 0.5 to 6 mm

More than 1 pc. (n pcs.) horizontal mounting

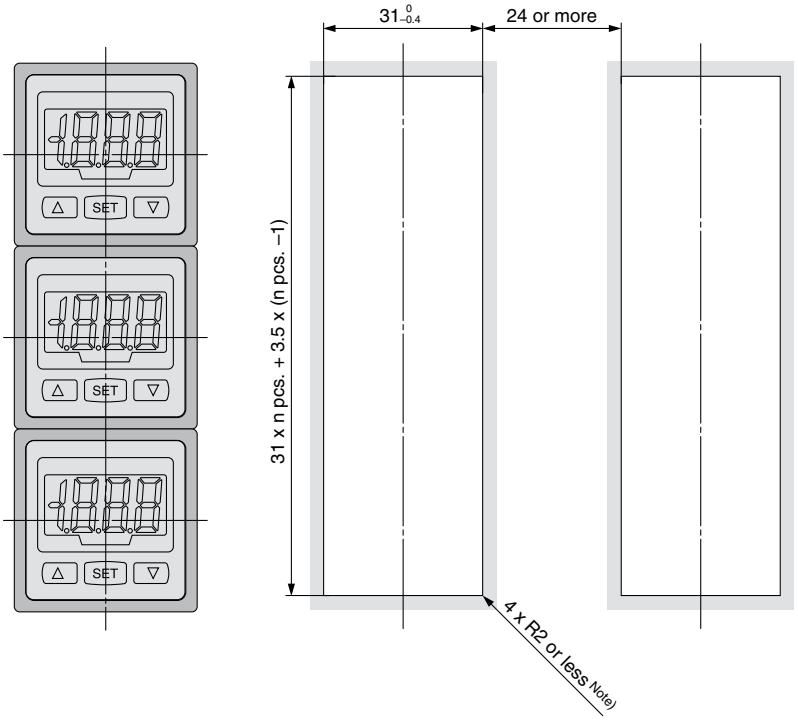


Individual mounting





More than 1 pc. (n pcs.) vertical mounting



Note) When providing a curvature radius (R), keep it to R2 or smaller.

Function Details

A Detection range correction function

By previously inputting a distance from the sensor to the object being measured, it is possible to reduce errors due to variations in the measurement distance.

B Peak/Bottom value indication

This function constantly detects and updates the maximum and minimum pressure values and allows to hold the display value.

C Keylock function

This function prevents incorrect operations such as changing the set value accidentally.

D Zero-adjust function

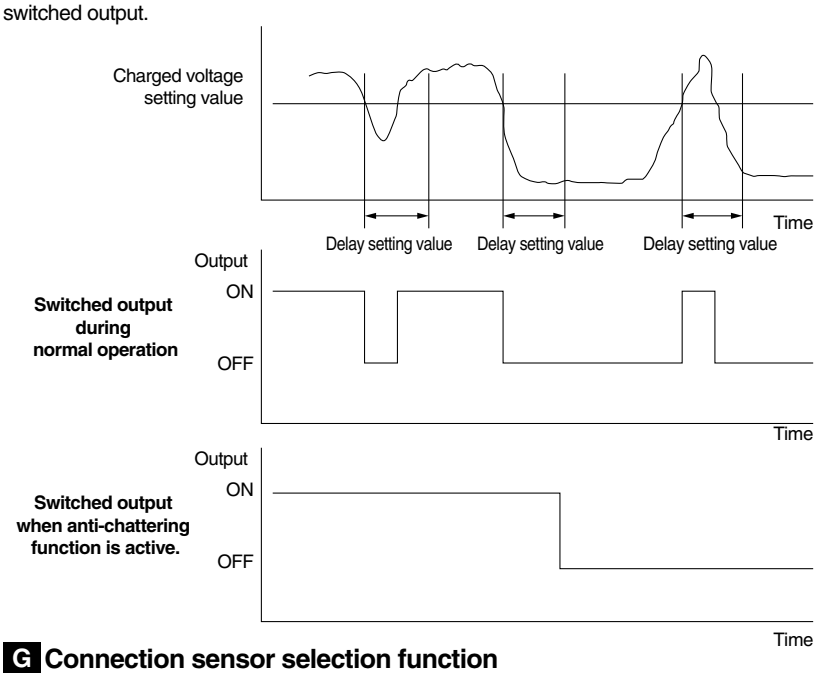
The reading of the measured voltage can be adjusted to zero. The reading can be corrected within ±10% of F.S. from the factory-set condition.

E Error display function

Error description		Error display	Condition
Over-current error	OUT1	Er 1	Load current of switch output is more than 80 mA.
	OUT2	Er2	
System error		Er3	Internal data error
Zero-adjust error		Er4	During zero adjustment, an amount of static electricity beyond ±10% of F.S. has been given to the sensor. ∗ After displaying the error code for approximately one second, the sensor automatically returns to measurement mode. The zero point may slightly fluctuate depending on the individual product difference and the sensor's mounting condition during zero adjustment.
Over-flow Under-flow		HHH	The displayable range has been exceeded because an amount of static electricity beyond the upper limit of the voltage measurement range has been given to the sensor or the measurement distance setting and/or the sensor mounting position is inappropriate, or for other reasons.
		LLL	The sensor may not have been wired yet or may have mistakenly wired. Alternatively, the displayable range has been exceeded because an amount of static electricity beyond the upper limit of the voltage measurement range has been given to the sensor or the measurement distance setting and/or the sensor mounting position is inappropriate, or for other reasons.

F Anti-chattering function

The charged voltage may vary temporarily. This function prevents such a momentary change from being detected as an abnormal voltage by changing the response time setting.
Response time: 100 ms, 500 ms, 1 s, 2 s or less
(Principal)
When a measured value is retained for an optionally set time length (delay time), the sensor compares the measured value with the set point to provide a switched output.



G Connection sensor selection function

The type (range) of electrostatic sensor to be connected can be selected. The monitor is factory-set to the ±0.4 kV option.

Series IZD10
Electrostatic Sensors Precautions 1

Be sure to read this before handling. Refer to back cover for Safety Instructions and pages 71 and 72 for Specific Product Precautions.

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 front matter 56), consult with SMC beforehand.

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

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

3. This product is not explosion-protected.

Never use this product in environment, where dust explosion may occur or flammable or explosive gases are used. This can cause fire.

⚠ Caution

1. This product is not cleaned. Before bringing this product into a clean room, remove particles using the clean dry air blow, etc. Before using the product, confirm that its cleanliness satisfies the required level.

2. Do not blow the clean dry air to the detection hole. Otherwise, the detection mechanism may be deformed. This may cause not only incorrect detection of the charged electric potential, but also sensor failure.

Mounting

⚠ Warning

1. Reserve an enough space for maintenance, piping and wiring.

Please take into consideration that the port location for external equipment, need enough space for the cable to be easily attached/detached.

To avoid excessive stress on the port location for external equipment, cable entry for sensor head and mounting base of cable entry for amplifier, please take into consideration the cables minimum bending radius and avoid bending at acute angles.

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

Minimum bending radius: 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 port location for external equipment, cable entry for sensor head and mounting base of cable entry for amplifier can receive excessive stress even though the minimum bending radius is allowable.)

2. Mounting on a plane surface.

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

3. Do not drop or bump the sensor.

When handling the sensor, do not drop the sensor or apply strong impact to it, as this may cause the sensor to malfunction or break down.

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.

Mounting

⚠ Warning

5. Observe the tightening torque requirements when installing the ionizer. (Refer to the operation manual included with the product.)

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.

6. Do not directly touch the detection surface of the sensor head with a metal piece or hand tool.

Touching the surface in this manner may not only cause the sensor to not only fail to provide the specified functionality and/or performance but also result in a sensor failure or an accident.

7. Do not affix any tape or seals to the main unit.

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

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

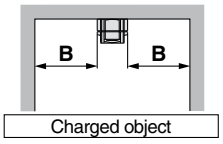
9. Keep the installation distance long enough to prevent static electricity from being discharged through the sensor head (refer to Technical Data on page 60 and Specifications on page 61).

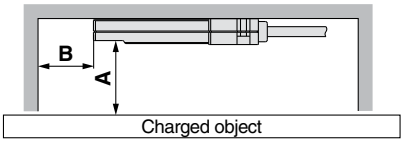
Static electricity may be discharged through the sensor head depending on the electrostatic potential of the object. Be extremely careful about this since electrostatic discharge through the sensor head may cause the sensor to break down.

⚠ Caution

1. Install the electrostatic sensor away from walls, etc., as shown below:

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





(mm)

A	B
10	20
20	40
25	45
30	55
40	65
50	75
60	90
70	100
75	105

2. After installation, always make sure that the electrostatic potential is measured correctly.

Errors may occur in the detected electrostatic potential depending on the ambient installation conditions, etc. After installation, check the sensor's condition with regard to electrostatic potential detection.

Series IZD10
Electrostatic Sensors Precautions 2

Be sure to read this before handling. Refer to back cover for Safety Instructions and pages 71 and 72 for Specific Product Precautions.

Wiring/Piping

⚠Warning

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

2. To maintain the product performance, ground the FG terminal with a resistance value of 100 Ω or less while referring to the instructions stated in this document.
When using a commercially available switching regulator, ground the GND and FG terminals.

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

4. Do not remove or attach wires from/to any parts, including the power supply, while the sensor is turned on, as this may cause the surface electrostatic sensor to malfunction. Be sure to the sensor is turned off prior to performing any wiring (including plugging/unplugging connectors).

5. 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.

6. Be sure to confirm there are no wiring errors before starting this product.
Faulty wiring will lead to product damage or malfunction.
Applying 24 VDC to the sensor output will directly lead to internal circuitry breakdown.

Operating Environment/Storage Environment

⚠Warning

1. Operate at an ambient temperature that is within the specifications.
Ambient temperature ranges from 32 to 122°F (0 to 50°C). 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. 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 32 to 122°F (0 to 50°C).
b) Avoid using in a place that exceeds an ambient humidity range of 35 to 85% 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 direct sunlight or radiated heat.
g) Avoid using in a place where there is a strong magnetic noise (strong electric field, strong magnetic field, or surge).
h) Avoid using in a place where the main body is electro-statically discharged.
i) Avoid using in a place where a strong high frequency occurs.
j) Avoid using in a place where this product is likely to be damaged by lightning.
k) Avoid using in a place where direct vibration or shock is applied to the main body.
l) Avoid using in a place where there is a force large enough to deform this product or weight is applied to the product.

Operating Environment/Storage Environment

⚠Warning

3. The electrostatic sensor is not resistant to lightning surges.
Take measures for protection against lightning surges on the system side.

Maintenance

⚠Caution

1. 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.

2. Do not disassemble or rebuild this product.
Otherwise, an electrical shock, damage and/or a fire may occur. Also, the disassembled or rebuilt products may not achieve the performances guaranteed in the specifications, and exercise caution because the product will not be warranted.

Handling

⚠Warning

1. Do not drop, bump or apply excessive impact (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. Do not operate this product with wet hands. Otherwise, an electrical shock or accident may occur.

3. Before use, allow the sensor to warm up for 10 minutes or more after power-on.
The sensor may provide unsteady readings immediately after power-on.

4. Use a UL-approved DC power supply compatible with the UL1310 Class 2 Power Unit or with power units comprising a UL1585 Class 2-compliant transformer, in combination with the sensor.

Series IZD10
Specific Product Precautions 1

Be sure to read this before handling. Refer to back cover for Safety Instructions and pages 69 and 70 for Electrostatic Sensors Precautions.

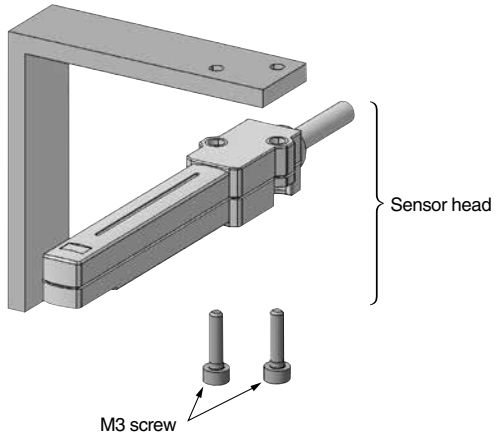
Mounting of Electrostatic Sensor

Mounting of Sensor Head

1. **When using the electrostatic sensor, install it in a location where the detection hole of the sensor head can detect the object being measured. (Refer to "Technical Data – Detection Range" on page 60.)**
2. **Install the sensor so that the distance between the detection hole and the object's surface is within 10 to 50 mm when the IZD10-110 is used and within 25 to 75 mm when the IZD10-510 is used. Be careful not to allow the sensor head to come into contact with the object. Static electricity may be discharged through the sensor head depending on the electrostatic potential of the object. Keep the installation distance long enough to prevent static electricity from being discharged through the sensor head. Be very careful about this since electrostatic discharge through the sensor head may cause the sensor to break down.**

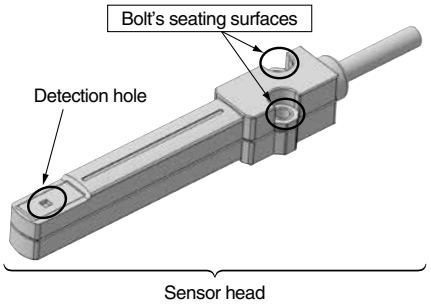
   The detection range and the sensor output vary depending on the installation distance. For more information, refer to "Technical Data - Output Signal and - Detection Range" on page 60.
3. **Use two M3-size screws (should be prepared separately) to mount the sensor head.**

   Recommended tightening torque for M3 screws: 0.45 to 0.46 lbf·ft (0.61 to 0.63 N·m)



4. **Align bolts with their seating surfaces to mount the sensor head. Mounting it by inserting the bolts from the opposite side may damage the sensor head.**

   The sensor head enclosure is in common with the GND terminal for reasons of the sensor structure. When installing or turning on the sensor, be very careful to avoid the enclosure from being short-circuited to the +24 V power supply. The detection hole is opened in order to detect static electricity. If any foreign matters enter the hole or the inner part of the hole is touched with a hand tool, etc., the sensor may malfunction or break down, resulting in a failure to correctly detect static electricity. Be careful not to allow any foreign matters to enter the inner part or touch it with a hand tool, etc. Do not pull the cable extending from the sensor head or twist it at the head's neck. Forcibly pulling or twisting the cable in this manner may cause the sensor head and/or the cable to break down.



Mounting of Sensor Amplifier

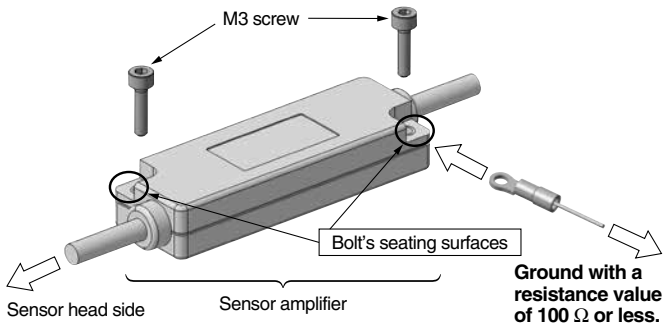
1. **Use two M3-size screws (should be prepared separately) to mount the sensor amplifier.**

   Recommended tightening torque for M3 screws: 0.45 to 0.46 lbf·ft (0.61 to 0.63 N·m)
2. **Align bolts with their seating surfaces to mount the sensor amplifier.**

   Mounting it by inserting the bolts from the opposite side may damage the sensor amplifier.
3. **Do not pull the cable extending from the sensor amplifier or twist it at the amplifier's neck.**

   Forcibly pulling or twisting the cable in this manner may cause the sensor amplifier and/or the cable to break down.
4. **Be sure to ground the FG terminal with a resistance value of 100 Ω or less since the sensor amplifier case is common to the FG terminal.**

   Recommended crimping terminal: TMEN1.25-3 insulation-coated crimping terminal from NICHIFU Co., ltd.



Series IZD10
Specific Product Precautions 2

Be sure to read this before handling. Refer to back cover for Safety Instructions and pages 69 and 70 for Electrostatic Sensors Precautions.

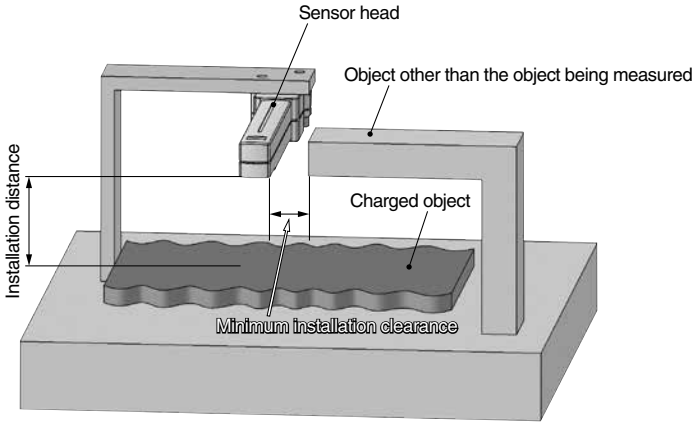
Mounting Precautions

1. Avoid placing any objects other than the object being measured or the sensor head cable close to the detection hole.

If any objects other than the object being measured are placed in the vicinity of the electrostatic sensor during sensor installation, the sensor will be affected by the objects thus placed and the sensor output will differ from the actual value.

2. To fix the sensor, use a bracket not coated with an insulating layer such as paint or a surface treatment material.

If any objects need to be placed near the electrostatic sensor, place them at a distance greater than the minimum installation clearances shown in the following table.



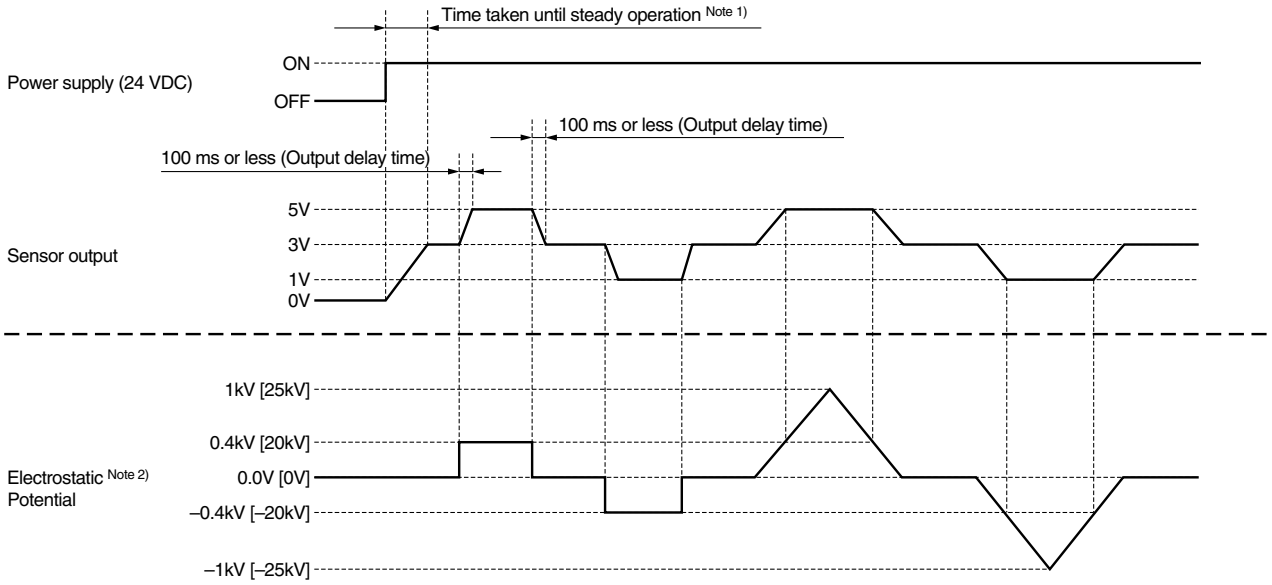
Installation distance (mm)	Min. installation clearance (mm)
10	20
20	40
25	45
30	55
40	65
50	75
60	90
70	100
75	105

3. Use the electrostatic sensor where there is no equipment nearby that generates electric or magnetic fields.

The electrostatic sensor is susceptible to electric and magnetic fields for reasons of its operating principle. If there are any current-carrying cables, transformers or radio equipment near the sensor head, the sensor may fail to correctly detect static electricity.

Timing Chart

The following is a timing chart where the installation distance (from the object being measured) of the electrostatic sensor is assumed to be 25 mm. (The installation distance is 50 mm for the IZD10-510.)



Note 1) The sensor is ready for operation approximately one second after power-on but may provide unsteady readings. It is therefore recommended that the sensor be used more than 10 minutes after power-on.

Note 2) The values are for the IZD10-110, while values in [ ] are for the IZD10-510.

Series IZE11
Electrostatic Sensor Monitors Precautions

Be sure to read this before handling. Refer to back cover for Safety Instructions.

■ Electrostatic Sensor Monitor

Operating Environment

⚠ Warning

1. Our electrostatic sensor monitor are CE marked; however, they are not equipped with surge protection against lightning. Lightning surge countermeasures should be applied directly to system components as necessary.

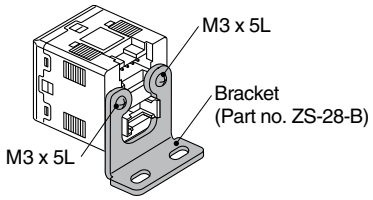
2. Our electrostatic sensor monitor do not have an explosion proof rating. Never use in the presence of an explosive gas as this may cause a serious explosion.

Mounting

⚠ Caution

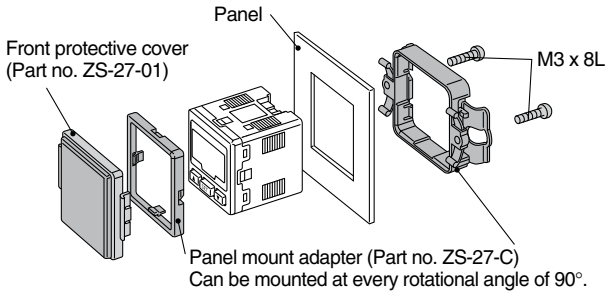
1. Mounting with a bracket

Mount a bracket to the body using two M3 x 5L mounting screws. Tightening torque for bracket mounting screw should be 0.37 to 0.52 lbf·ft (0.5 to 0.7 N·m).



2. Mounting with panel mount adapter

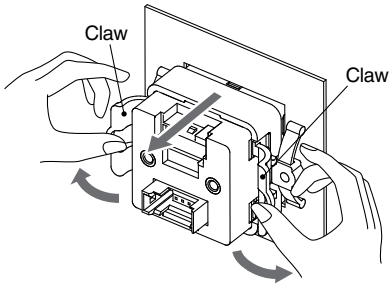
Mount a panel mount adapter using two M3 x 8L mounting screws.



3. When removing the panel mount adapter

To remove the electrostatic sensor monitor with a panel mount adapter from user equipment, first remove the two mounting screws, then push the clips outward as shown in the figure and pull the monitor back towards you.

Removing the monitor otherwise may damage the monitor and/or the panel mount adapter.

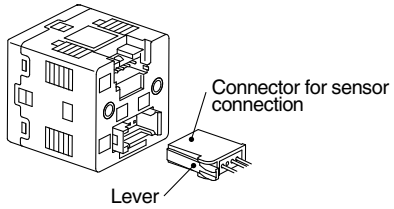


Wiring

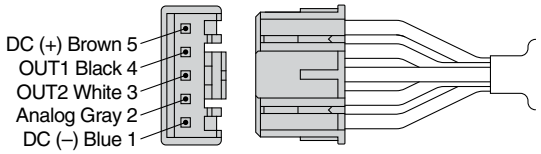
⚠ Caution

1. Connection/Removal of Connector

- Insert the connector straight while pinching the lever, and then push the lever into the jack of the housing and lock it.
- Pull the connector straight out while applying pressure with your thumb to the lever and unhooking it from the jack.



2. Connector pin no. of connection cable for power supply/output



Setting

⚠ Warning

1. If not correctly set to the option specified for the connected sensor, the monitor will fail to display correct electrostatic potentials.

When initially setting up the monitor or connecting a sensor to the monitor, always make sure that the selected option and the electrostatic sensor agree with each other.

∗ The monitor is factory-set to the ±0.4 kV option.

Handheld Electrostatic Meter

Series *IZH10*

CE

RoHS

Easy-to-use handheld electrostatic meter

○ **Rated charge amount range: ±20.0 kV**

○ **Minimum display unit: 0.1 kV** (±1.0 to ±20.0 kV)
0.01 kV (0 to ±0.99 kV)

○ **Compact & Lightweight: 85 g**
(excluding dry cell batteries)
○ **Peak/Bottom value indication**
○ **Zero-clear function**
○ **Auto power-off function**
○ **LOW battery indicator**
○ **Backlight for reading in the dark**

Handheld Electrostatic Meter
Series IZH10

How to Order

IZH 10 – □

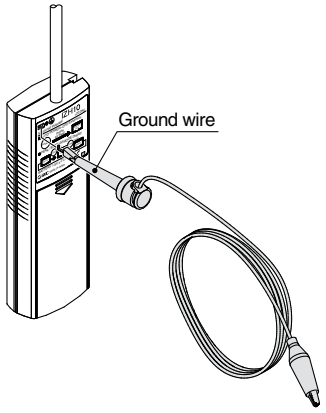
Option

Nil	None
H	High-voltage measuring handle

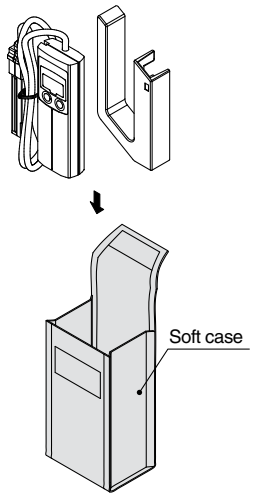
Accessories and Option/Part Number for Individual Parts

∗ The ground wire and soft case are attached to the IZH series.

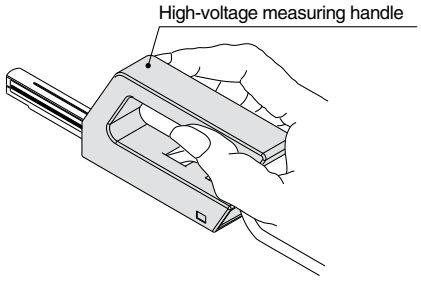
Ground wire (1.5 m)/Accessories
IZH-A-01



Soft case/Accessories
IZH-B-01



High-voltage measuring handle/Option
IZH-C-01



Note) Be sure to use a high-voltage measuring handle in situations such as during high-voltage measurement when there is a possibility of personnel coming in contact with electricity.

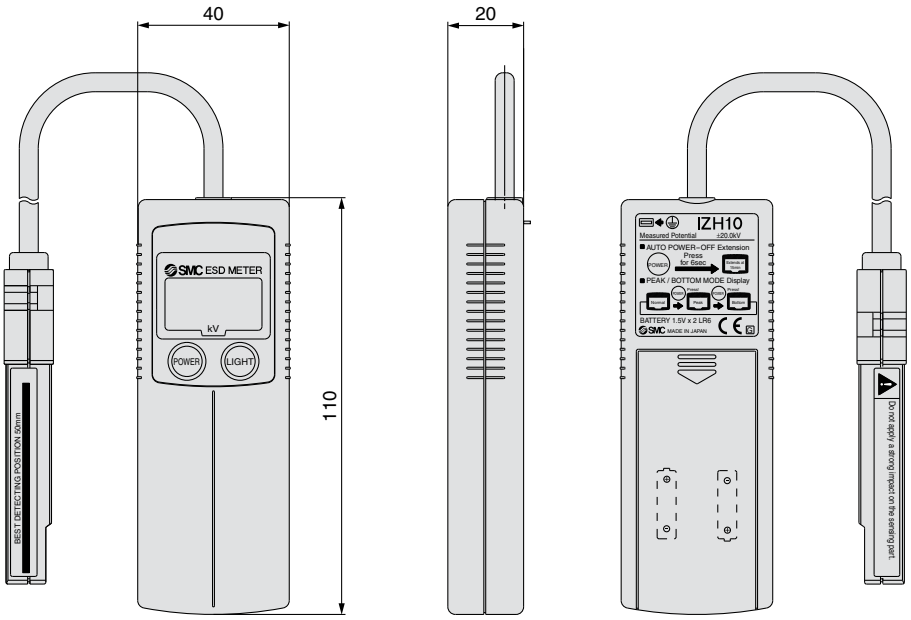
Specifications

Model		IZH10
Rated charge amount range		±20.0 kV
Minimum display unit		0.1 kV (±1.0 kV to ±20.0 kV), 0.01 kV (0 to ±0.99 kV)
Measurement distance		50 mm (between sensor part and measured target)
Power supply Note 1)		1.5 VDC 2A alkali dry cell battery, 2 pcs (continuous use for 15 hours or more, see Note 2))
Display accuracy		±5% F.S. ±1 digit
Environment	**Enclosure**	IP40
	Operating temperature range	Operating: 32 to 104°F (0 to 40°C), Stored: 14 to 140°F (–10 to 60°C) (with no freezing or condensation)
	Operating humidity range	Operating/Stored: 35 to 85% R.H. (with no condensation)
	Vibration resistance	10 to 150 Hz at whichever is smaller of 1.5 mm amplitude or 98 m/s^2 acceleration, in X, Y, Z directions for 2 hs. each (De-energized)
	Impact resistance	100 m/s^2 in X, Y, Z directions 3 times each (De-energized)
Material		Display part: PC/ABS Sensor part: ABS
Weight		85 g (excluding dry cell batteries)
Standards		CE marking
Accessories		Ground wire, Soft case

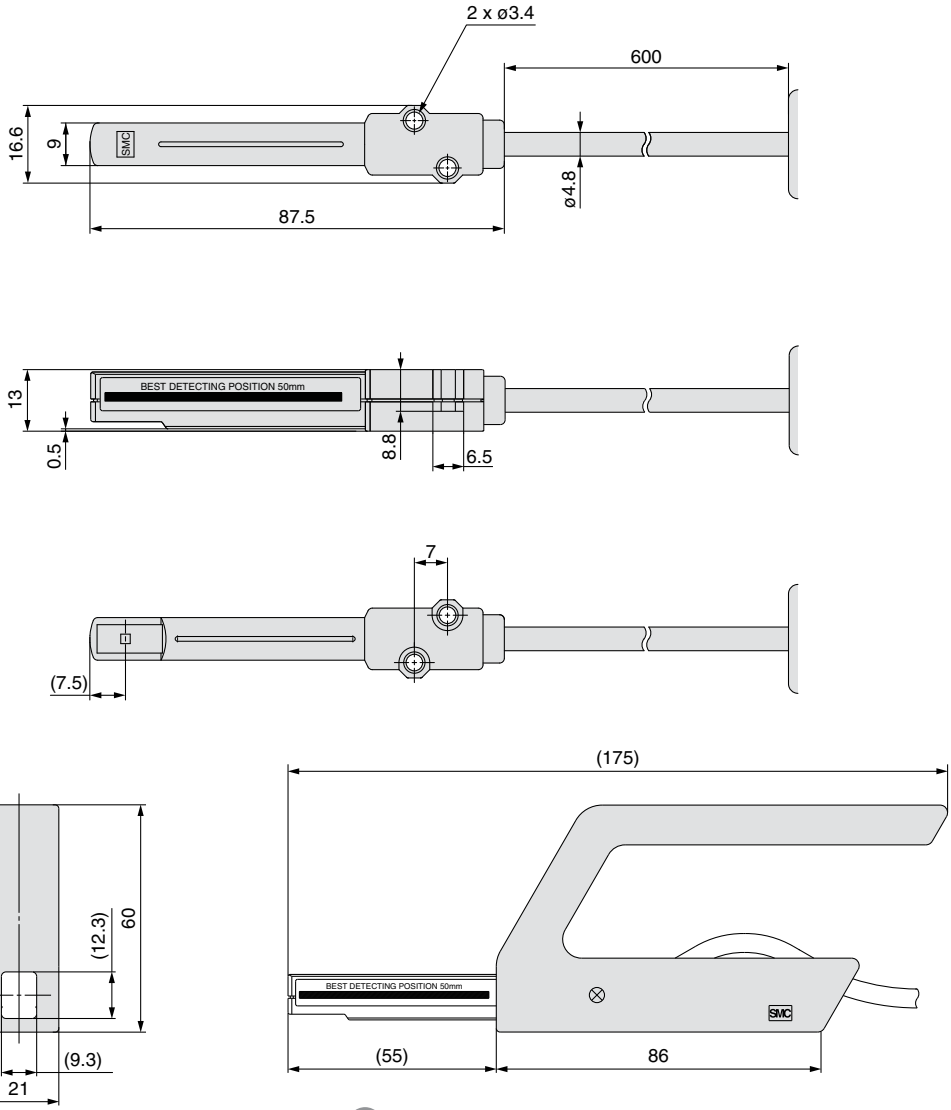
Note 1) 2A alkali dry cell batteries are not included, and must be acquired separately.
Note 2) When new alkali dry cell batteries are used at ordinary temperature.

Dimensions (Unit: mm)

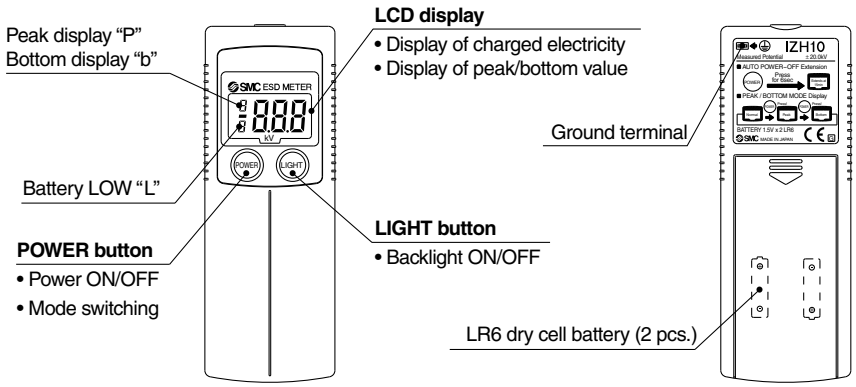
Display part



Sensor part



Names and Functions of Individual Parts



Function Details

A Peak/Bottom value indication

The function constantly detects and updates the maximum and minimum electrostatic potential value and allows holding the display value.

B Zero-clear function

This function clears and resets the zero value on the display of measured pressure.
The reading can be corrected within ±5% of F.S. from the factory-set condition.

C LOW battery indicator

When the batteries are low it is displayed in two stages: "Battery LOW" and "Replace Battery".
The battery level is indicated by the flashing or lightening up of " " on the display.
• "L" flashes: Prepare to replace batteries.
• "L" lights up: Replace batteries with new ones.

D Auto power-off function

If no button is operated for 5 min. or more while the power supply is on, the power supply will turn off automatically.
When the [POWER] button is pressed for 6 sec. or more with the power supply off, continuous operating time while no button is pushed will extend to 15 min.

E Light-up of backlight

The display can be easily seen in the dark.
The backlight will be turned on and off by every press of the [LIGHT] button.

F Displayed digit change function

The minimum display digit is changed for the charged potential between –0.99 kV to +0.99 kV.

Error Display

Error description	Error display	Condition
Zero clear error	Er 1	A charge over ±5% F.S. of default potential is applied to the sensor. ∗ The indication lasts approx. 1 sec. and then measurement mode returns automatically. There will be a slight displacement, depending on the deviation of the sensor itself and ambient environment.
Sensor error	Er2	The sensor breaks.
System error	Er3	Internal data error.
Measurement error	HHH	A charge over the upper limit of the measured voltage range is applied to the sensor, or the distance to the measured target is outside of specified range.
	LLL	A charge over the lower limit of the measured voltage range is applied to the sensor, or the distance to the measured target is outside of specified range.
Cable breakage	—	A broken cable prevents accurate measurement. The charge amount can be detected, but it will not change the displayed value.

Series IZH10
Handheld Electrostatic Meter Precautions

Be sure to read this before handling. Refer to back cover for Safety Instructions.

Handling Precautions

⚠Warning

1. Do not make any modifications (including exchanging the printed circuit board) to the product.

It may cause human injuries and damage.

2. Use the device in the condition of specified range.

Using it out of the specified range may result in fires, electric shock, or damage. Confirm the specifications before using.

3. Measurement near high-voltage

Avoid measuring near high-voltage exceeding specifications as it can be dangerous.

4. Handling of ground wire

Be sure to provide a ground wire to ensure safety and high- accuracy measurement when using the sensor.

Also, if the ground wire is not connected properly, the power is pooled in the sensor part and/or ground terminal, which can discharge to an operator's hand. Handle the sensor part and ground terminal carefully.

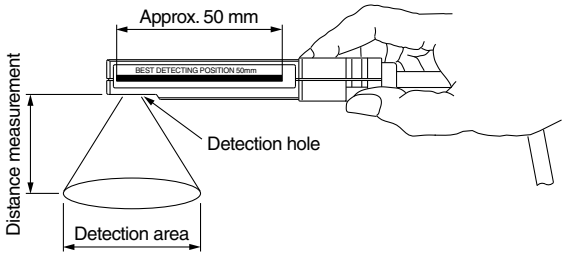
If grounding is not provided,

- Measurement accuracy gets worse.
- The sensor is charged and can discharge to an operator's hand.

5. Do not apply strong impact.

Do not drop, allow collision or apply excessive shock to the sensor when handling. It can result in damage of the sensor and accidents.

6. Distance measurement is 50 mm. Use display of label attached to the sensors as a guide.



7. The measurement of a part with a high-charge potential can be highly dangerous as it can cause a discharge to the user's hand.

In this case, use a handle specific for measuring high voltage, which is available as an option, and wear rubber gloves, etc. Also, gradually bring the sensor part close to the measured target from a distance, and stop the measurement immediately when the displayed value overflows (HHH) or underflows (LLL). (A target with a high-charge potential is very dangerous. The measured value does not changed even if the distance is shortened.)

Operating Environment

⚠Warning

1. Handheld electrostatic meters are CE marked; however, they are not equipped with surge protection against lighting. Lighting surge countermeasures should be applied directly to system components as necessary.

2. Handheld electrostatic meters do not have an explosion proof rating. Never use in the presence of an explosive gas as this may cause a serious explosion.

⚠ 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.

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

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