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# OPERATION MANUAL

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PRODUCT NAME: **Ionizer**

MODEL: IZS30 Series

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Read this operation manual carefully to understand before installation and operation. Pay extra attention on the clause concerning the safety. Keep this operation manual available whenever necessary.

**SMC CORPORATION**

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## 1. Safety instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard by labeling "**Caution**", "**Warning**", and "**Danger**". To ensure safety, be sure to observe ISO4414, JIS B8370 and other safety precautions.

 CAUTION Operator error could result in injury or equipment damage.

 WARNING Operator error could result in serious injury or loss of life.

 DANGER In extreme conditions, there is a possibility of serious injury or loss of life.

## WARNING

### **1. The compatibility of equipment is the responsibility of the person who designs the system or decides its specifications.**

Since the products specified here are used in various operating conditions, their compatibility with the specific system must be based on specifications or after analysis and/or tests to meet your specific requirements. Those who decide the compatibility of equipment shall take the responsibility to guarantee the initial system performance and safety. Construct system as reviewing all specifications in the latest catalog or documents as well as considering the possibility of equipment in every occasion.

### **2. Only trained personnel should operate machinery and equipment.**

This product generates high voltage, so it can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of systems should be performed by trained and experienced operators.

### **3. Do not service machinery/equipment or attempt to eliminate components until safety is confirmed.**

- 1) Inspection and maintenance of the machinery and equipment should be performed after confirmation of the safety such as earthing, prevention of electric shock and each type of injury.
- 2) When equipment is to be eliminated, confirm the safety process as mentioned above. Cut air pressure supply and electric power supply that are the energy source for the equipment, and exhaust all residual compressed air in the system.
- 3) Before machinery/equipment is re-started, take measures to prevent short circuit etc. with enough care.

### **4. Do not use product under the following conditions or environments. If it is not avoidable, take appropriate measures and contact SMC.**

- 1) Conditions and environments beyond specifications or if product is used outdoors.
- 2) Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, pressing clutch, break circuit and safety equipment.
- 3) An application which has the possibility of having negative effects on people, property, or animals requiring special safety analysis.

## Selection

### WARNING

1. This product is made for general industry. Contact SMC before use, if you are planning to use for other purposes.
2. Use under specified voltage and temperature.  
Voltage out of specification may cause malfunction, breakage, electric shock and fire.
3. Use clean compressed air for fluid.  
The construction of this product is not explosion proof. Do not use fluid such as inflammable gas or explosive gas or use in atmosphere including such a gas. It may result in fire or explosion.  
When using fluid other than compressed air, contact SMC.

### CAUTION

1. This product has not been washed.  
When bringing into clean room. Use after confirming its purification level after flushing.

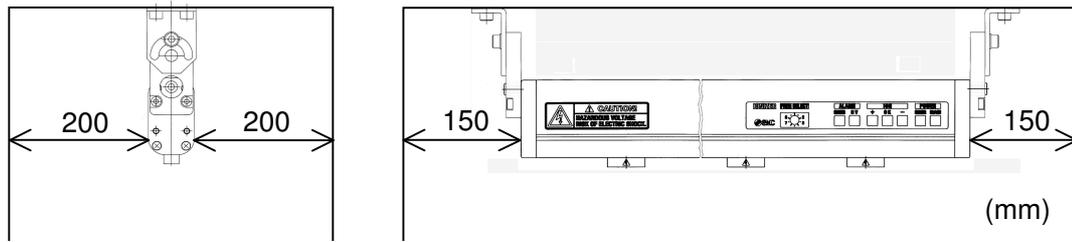
## Installation

### WARNING

1. Get required space for maintenance, wiring and piping at installation.  
Install connector and One-touch fitting for air supply to be able to eliminate and mount cable and tube.  
Do not bend cable and tube with steep angle but fix them straight considering minimum bending radius to prevent forcible stress applied to installation base of connector and One-touch fitting.  
Forcible installation and elimination may cause malfunction, broken wire, fire and air leakage.  
Minimum bending radius: Power supply cable ······20mm  
Sensor cable ······20 mm  
(Note: Here is allowable bending radius when fixing wiring at 20°C. If bending cable at lower temperature, it may apply forcible force to connector even with minimum bending radius or more.)  
See instruction or catalog for minimum bending radius fo tube.
2. Install on the plane face.  
Forcible force may apply to frame or case due to concave and convex or deformed mounting face and large level gap, and it may cause breakage or operation failure. Also, dropping or strong impact may cause operation failure or accident.
3. Do not install with strong electromagnetic source.  
Installation with strong electromagnetic source may cause malfunction. Install on the different panel or separate the mounting.
4. Tighten within the specified torque. (tightening torque: See “4. Installation”)  
When exceeding the tightening torque, mounting screw and mounting bracket etc. might be broken.  
The screw might loosen for less than range of the tightening torque.
5. Do not touch electrode needle with finger or metal tool directly. It may cause injury.  
If electrode needle or cartridge is damaged by tools, it will not only interfere the specification function and performance but also may cause operation failure or accident.
6. Be sure to install and adjust after power supply is stopped.

### CAUTION

1. Install IZS30 series with keeping distance from the wall etc. as shown in the figure below.  
The generated ion might not reach the target effectively and efficiency decrease, where there is wall etc. inside the area shown in the figure below.



## Wiring and piping

### ⚠️ WARNING

1. Check that power supply capacity is enough and voltage is in specification before piping.
2. Apply type D earthing to prevent electrical shock in accordance with instructions on this operation manual.
3. Be sure to cut off power supply at wiring (including connector plug-in/out) .
4. Use special cable for the connection between body and sensor, and disassembly and reconstruction are prohibited.
5. Turn on the power after examining wiring and a surrounding situation enough, and confirming safety.
6. Do not connect and disconnect connectors while supplying the power
7. Installation with high-voltage line and power line in the same wiring route may cause malfunction by noise. Install separately with them.
8. Be sure there is no incorrect wiring before operation. Incorrect wiring may cause product breakage or malfunction.
9. Flush pneumatic piping before its installation. Make sure that all dust, water droplet, oil etc. are eliminated before piping.

## Environment

### ⚠️ WARNING

1. Use within operating fluid and ambient temperature range.  
 Operating fluid and ambient temperature range for Ionizer and sensor are 0 to 50°C. When temp. is 5°C or less, take measure to prevent freezing. Though ambient temperature is within specification, dew condensation might be generated where temperature is suddenly changed. Therefore do not use under such environment.
2. Environment to avoid  
 Do not use or store under the following environments, as these may cause operation failure. If it is unavoidable, take the appropriate measures.
  - a. The place where ambient temperature exceeds 0 to 5°C.
  - b. The place where ambient humidity exceeds 35 to 85% RH.
  - c. The place where dew condensation is generated due to sudden temperature change.
  - d. The place where there is corrosive gas, inflammable gas, and volatile inflammable substance is stored.
  - e. The atmosphere where the product is exposed to conductive powder such as iron powder and dust, oil mist, salt and organic solvent or machining chips, particles and cutting oil (water, liquid).
  - f. The place where product is directly exposed to the blow from air-conditioners.
  - g. The place where sealed and ventilation is not installed.
  - h. The place the product is exposed to the direct sunlight and radiant heat.
  - i. The place where strong electromagnetic noise is generated. (Strong electric field/ strong magnetic field/ surge.)
  - j. The place where electricity is discharged. The situation which causes electric discharge on the

product.

k. The place where strong high frequency is generated.

l. The place where lightning disaster is expected.

m. The place where the product is directly exposed to the vibration and impact.

n. The situation where the force and weight that causes deformation of the product is applied.

3. Do not use air containing mist or dust.

Air containing mist or dust may lower function and shorten maintenance cycle. Mount mist separator and air dryer in front of filter to produce clean compressed air.

4. Ionizer and sensor are not tolerable against surge of lightning.

Protection against lightning surge should be incorporated in the equipment..

## Maintenance

### CAUTION

1. Keep electrode needle clean by regular maintenance.

Make sure that the equipment is operating without any failure by regular maintenance. Those who have enough knowledge and experience should perform the maintenance of the equipment.

Dust attached on the electrode needle due to longer operating lowers the function to eliminate static electricity. If electrode does not recover its function to eliminate static electricity due to worn out after cleaning, replace it with the new one. In order to maintain the stable performance, regular maintenance and cleaning of electrode are recommended.

2. Stop supplying power to the body without fail when cleaning the electrode needle or exchanging the electrode cartridge. Do not touch the electrode needle while energizing, or it may cause electric shock or accident.

3. Do not open the case to disassemble and reconstruct the product.

It may cause electric shock, operation failure and disaster such as fire. In addition, note the product, which is disassembled or reconstructed, may not satisfy the functions and performance in the specifications and is out of guarantee.

## Handling

### WARNING

1. Do not drop, hit to the object and give excessive impact (10G or more) at handling.

Though ionizer itself doesn't break, inside construction might be broken and cause malfunction.

2. When cable is mounted or eliminated, pinch modular plug claw with finger and insert or take out the plug itself vertically. If mounted or eliminated to inappropriate direction, mounting part of modular jack might be damaged and finally it leads to operation failure.

3. Do not operate with wet hands. It may cause electric shock or accident.

## 2. How to order

Ionizer

IZS30-780 S B

|              |                  |
|--------------|------------------|
| Product name |                  |
| IZS30        | Bar type ionizer |

|            |         |
|------------|---------|
| Bar length |         |
| 300        | 300 mm  |
| 780        | 780 mm  |
| 1260       | 1260 mm |
| 1500       | 1500 mm |
| 1900       | 1900 mm |

Power supply cable is attached for all models.

|        |             |
|--------|-------------|
| Sensor |             |
| S      | Mounted     |
| *      | Not mounted |

For [mounted], sensor cable and sensor bracket are attached.

|         |             |
|---------|-------------|
| Bracket |             |
| B       | Mounted     |
| *       | Not mounted |

For "mounted", two brackets for body end are attached.

Number of attached bracket for body middle part is by the bar length.  
(See below)

| Bar length | Number of bracket for body middle part |
|------------|----------------------------------------|
| 300, 780   | *                                      |
| 1260, 1500 | 1                                      |
| 1900       | 2                                      |

Sensor

IZS30 - D1

|           |        |
|-----------|--------|
| Part name |        |
| D         | Sensor |

|      |                    |
|------|--------------------|
| Type |                    |
| 1    | Rotary sector type |

Cable

IZS30 - CS

|           |       |
|-----------|-------|
| Part name |       |
| C         | Cable |

|      |                     |
|------|---------------------|
| Type |                     |
| S    | For sensor 3m       |
| P    | For power supply 3m |

Bracket

IZS30 - BE

|           |         |
|-----------|---------|
| Part name |         |
| B         | Bracket |

|      |                      |
|------|----------------------|
| Type |                      |
| E    | For body end         |
| M    | For body middle part |
| S    | For sensor           |

Electrode needle cartridge

IZS30 - NT

|           |                        |
|-----------|------------------------|
| Part name |                        |
| N         | Electrode Needle cart. |

|      |          |
|------|----------|
| Type |          |
| T    | Tungsten |

### 3. Specifications

#### 3-1. Ionizer

| Ionizer model                  |                                      | IZS30<br>-300                                                                | IZS30<br>-780 | IZS30<br>-1260 | IZS30<br>-1500 | IZS30<br>-1900 |
|--------------------------------|--------------------------------------|------------------------------------------------------------------------------|---------------|----------------|----------------|----------------|
| Type                           |                                      | Bar type                                                                     |               |                |                |                |
| Ion generation principle       |                                      | Corona discharge                                                             |               |                |                |                |
| Voltage supply method          |                                      | Pulse DC                                                                     |               |                |                |                |
| Discharge output               |                                      | +/-6000V                                                                     |               |                |                |                |
| Ion balance *1                 |                                      | +/- 30V or less                                                              |               |                |                |                |
| Purge air                      | Fluid                                | Air (Clean dry air)                                                          |               |                |                |                |
|                                | Air supply flow rate *2 (L/min[ANR]) | 20                                                                           | 50            | 85             | 110            | 135            |
|                                | Op. pressure (MPa)                   | Max. 0.7                                                                     |               |                |                |                |
|                                | Connection tube size                 | φ4                                                                           |               |                |                |                |
| Power supply voltage           |                                      | DC21.6V to 26.4V                                                             |               |                |                |                |
| Current consumption            | Sensing DC mode operated             | 150mA or less                                                                |               |                |                |                |
|                                | Sensing DC mode stand-by             | 100mA or less                                                                |               |                |                |                |
|                                | Pulse DC mode                        | 100mA or less                                                                |               |                |                |                |
| Input signal                   | Discharge stop                       | NPN Open collector, or no-voltage contact signal                             |               |                |                |                |
| Output signal                  | High volt. error                     | FET(Open Drain), DC28V, 100mA or less                                        |               |                |                |                |
|                                | Sensor error                         |                                                                              |               |                |                |                |
|                                | Static elimination completed         |                                                                              |               |                |                |                |
| Effective elimination distance |                                      | 50 to 2000mm<br>(Sensing DC mode 200 to 2000mm)                              |               |                |                |                |
| Ambient temperature            |                                      | 0 to + 50°C                                                                  |               |                |                |                |
| Ambient humidity               |                                      | 35 to 80% Rh (No dew condensation)                                           |               |                |                |                |
| Material                       |                                      | Ionizer cover: ABS, Electrode: Tungsten                                      |               |                |                |                |
| Vibration resistance           |                                      | Endurance 50Hz Amplitude 1mm<br>2 hours to X,Y,Z each direction of vibration |               |                |                |                |
| Impact resistance              |                                      | 10G                                                                          |               |                |                |                |
| Weight (g)                     |                                      | 330                                                                          | 710           | 1100           | 1410           | 1930           |

[Note] \*1: At distance 300mm between Ionizer and charged object, with purge air.

\*2: The smallest flow rate for elimination at distance 200mm between Ionizer and charged object.

#### 3-2. Surface electric potential sensor

| Sensor model                 | IZS30-D1                                                                     |
|------------------------------|------------------------------------------------------------------------------|
| Detection style              | Rotary sector style                                                          |
| Power supply voltage         | DC5V (Supplied from Ionizer)                                                 |
| Power consumption            | Included in the Sensing DC mode power consumption on the ionizer.            |
| Effective detection distance | 50mm or less                                                                 |
| Ambient temperature          | 0 to +50°C                                                                   |
| Ambient humidity             | 35 to 85 % Rh (No dew condensation)                                          |
| Material                     | Sensor body: Aluminum                                                        |
| Vibration resistance         | Endurance 50Hz Amplitude 1mm<br>2 hours to X,Y,Z each direction of vibration |
| Impact resistance            | 10G                                                                          |
| Weight (g)                   | 150                                                                          |

## 4. Installation

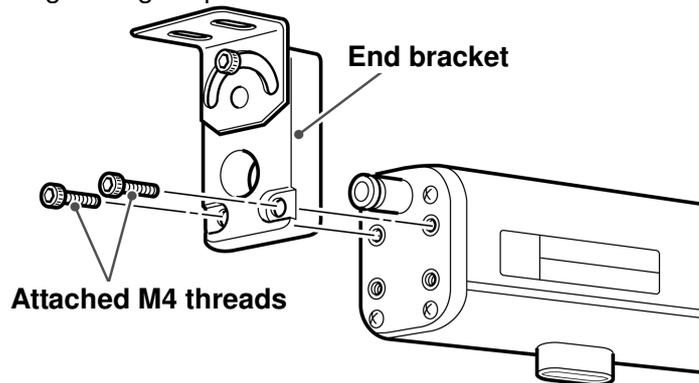
### 4-1. Installation of Ionizer body

Investigate the places where static problem occurs, or process and parts which generate ESD (Electro static discharge), and carefully consider the required conditions to ensure appropriate static charge elimination before installation.

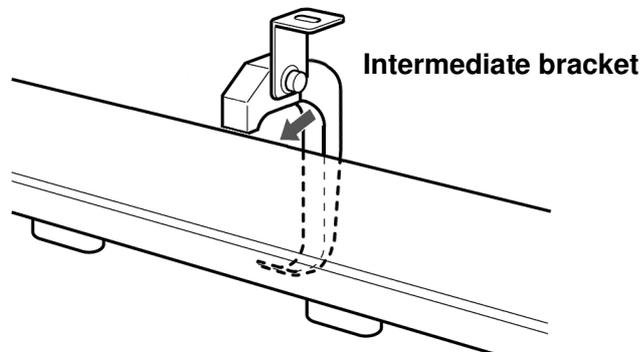
Operating distance and static charge elimination time: See [1. installation distance and static charge elimination time of 6-1.Static charge elimination characteristics (reference) ].

Static charge elimination area: See [See 2. Static charge elimination area of 6.1 Static charge elimination characteristics (reference)].

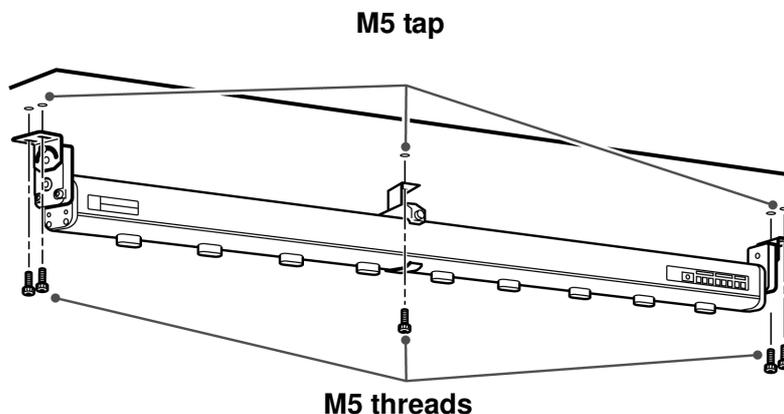
1. Mount end brackets on both sides of the ionizer body with the attached M4 threads. Recommended tightening torque for M4 thread: 0.75Nm



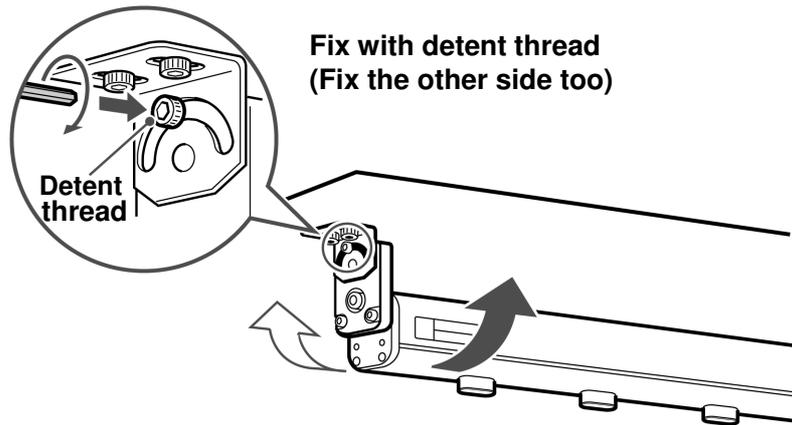
2. Mount intermediate brackets on the ionizer body at regular interval.  
【Note】 No intermediate bracket is attached to IZS30-300B (SB), IZS30-780B (SB)).



- A. Tap M5 thread on the brackets mounting positions at the installation side, and fix the ionizer body and brackets with M5 threads.



4. Adjust angle of the ionizer body to ensure proper static charge elimination, and fix it with detent threads (M5) of brackets.  
Recommended tightening torque for detent thread: 1.5Nm



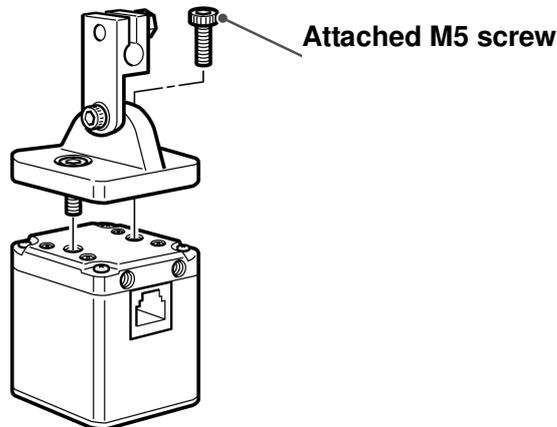
#### 4-2. Installation of surface electric potential sensor

In case of using a surface electric potential sensor, install it on the place which can realize the precise sensing in order for the detecting hole to sense the target's static charge.

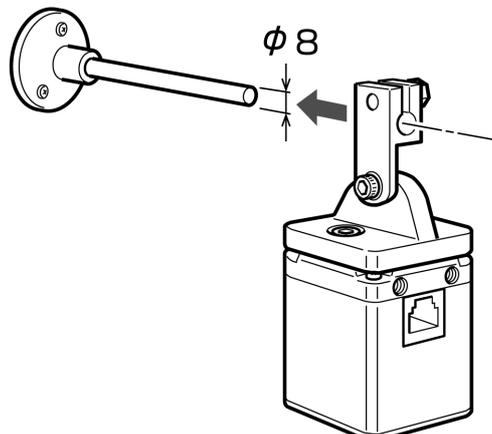
**【Note】** Install so that **the detecting hole will be within 50mm from the surface of target's static charge..**

**In case of using a surface electric potential sensor, install it so that the distance between the object for static charge elimination and the ionizer stays 200 or more.**

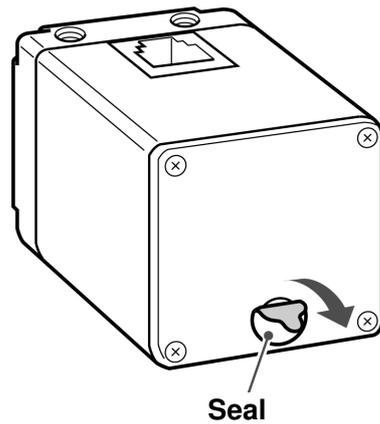
- 1) Mount a sensor bracket on the surface electric potential sensor with the attached M5 thread.  
Recommended tightening torque for M5 thread: 1.5Nm



2. Insert a sensor bracket into a  $\phi 8$  rod or hollow piping at the installation side, and fix them with a thread (M5).

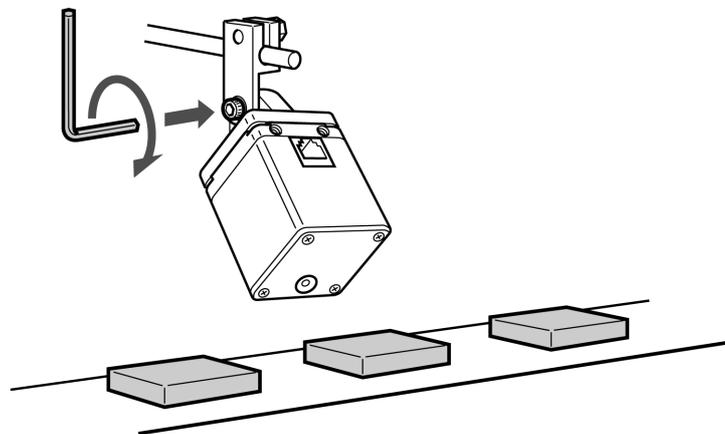


3. Peel off the seal attached on the detecting hole of the surface electric potential sensor.



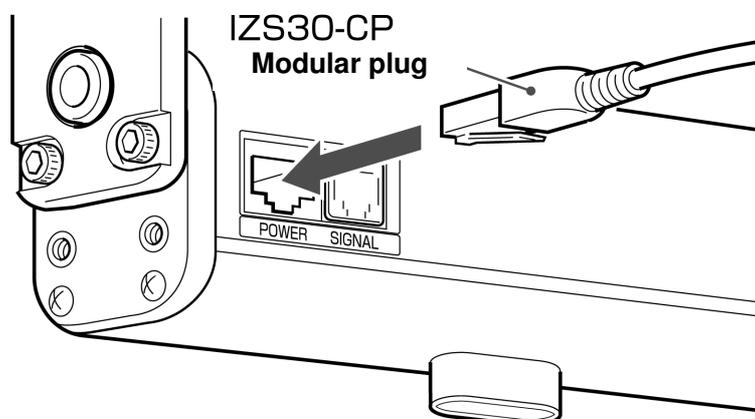
4. Direct the surface electric potential sensor to the target's static charge as adjusting the angle, and fix the detent thread (M5) of bracket.

Recommended tightening torque for detent thread : 1.5 Nm



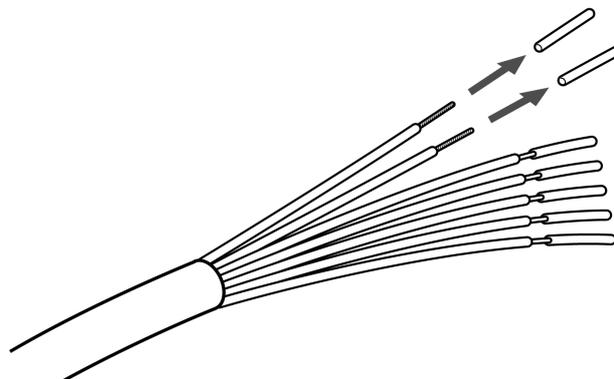
#### 4-3. Connection of cable

1. Insert the modular plug of power supply cable ZS30-CP into the modular jack for indicating [power] on the ionizer body. A lever will snap when the modular plug is correctly locked. Fix cables with a tie wrap or other measures in the vicinity of connection not to apply compulsive force to the modular jack and plug.



2. Arrange lead wires in accordance with the wiring table. The unused wires should be cut short or covered with vinyl tape without peeling the coat to prevent them from coming contact with other wires.

See [4-4. Connection circuit ].

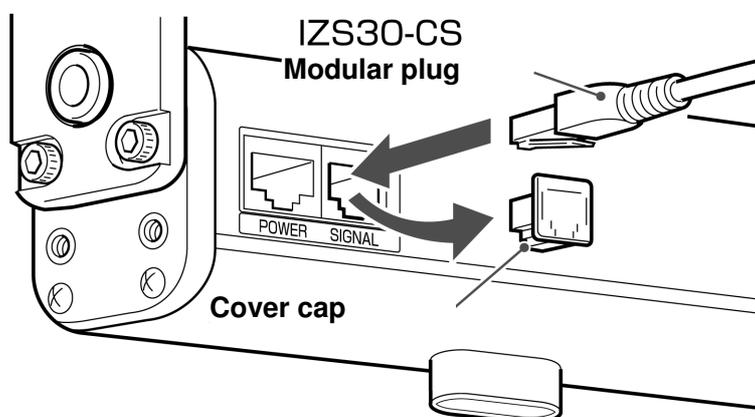


Wiring table for power supply cable IZS30-CP

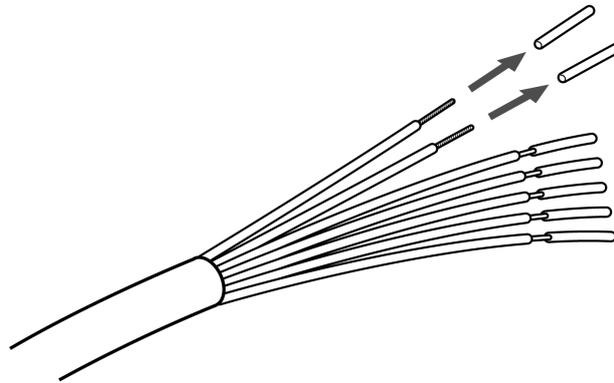
| Pin No | Lead wire color | Description                                     | Function                                                                                           |
|--------|-----------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 1      | Brown           | DC21.6 to 26.4V                                 | Power supply DC + 24 V                                                                             |
| 2      | Blue            | GND                                             | Power supply 0V. Be sure to apply class D grounding.                                               |
| 3      | Green           | NC                                              | —                                                                                                  |
| 4      | Gray            | Stop signal of static charge elimination        | Connected 0V during operation. Opening stops discharge.                                            |
| 5      | White           | Signal for abnormal High voltage                | Outputted when abnormal discharge occurs.                                                          |
| 6      | Orange          | Signal for abnormal sensing                     | Outputted when abnormal operation occurs on the surface electric potential sensor.                 |
| 7      | Red             | NC                                              | —                                                                                                  |
| 8      | Yellow          | Signal for static charge elimination completion | Notify the progress and completion of static charge elimination with ON and OFF signal to outside. |

【Note】 No. 6 and 8 only function when a surface electric potential sensor is used.

2. 3. When a surface electric potential sensor is used, remove the cover cap plugging a modular jack for indicating [signal] on ionizer body, and insert a modular plug of sensor cable IZS30-CS. A lever will snap when the modular plug is correctly locked Fix cables with a tie wrap or other measures in the vicinity of connection not to apply compulsive force to the modular jack and plug. (Direction of plugs on both sides of cable can be changed.)



2. Arrange lead wires in accordance with the wiring table. The unused wires should be cut short or covered with vinyl tape without peeling the coat to prevent them from coming contact with other wires.  
See [4-4. Connection circuit ].

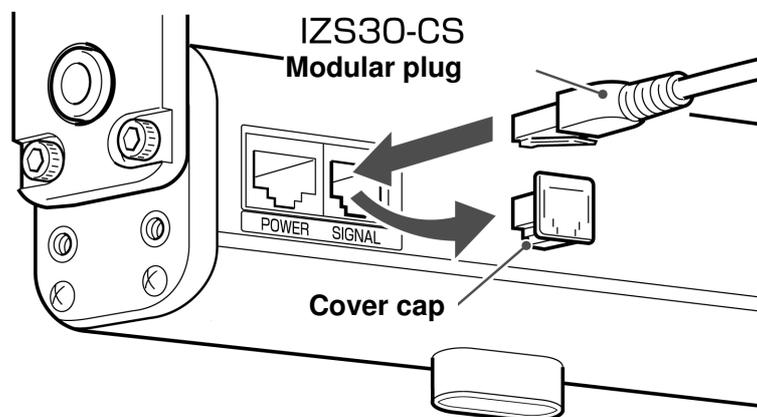


Wiring table for power supply cable IZS30-CP

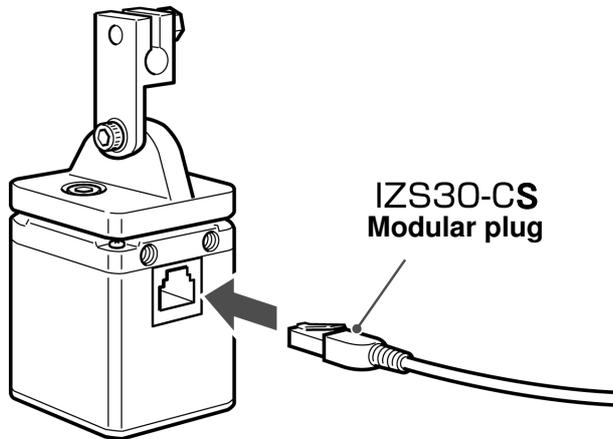
| Pin No | Lead wire color | Description                                     | Function                                                                                           |
|--------|-----------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 1      | Brown           | DC21.6 to 26.4V                                 | Power supply DC + 24 V                                                                             |
| 2      | Blue            | GND                                             | Power supply 0V. Be sure to apply class D grounding.                                               |
| 3      | Green           | NC                                              | —                                                                                                  |
| 4      | Gray            | Stop signal of static charge elimination        | Connected 0V during operation. Opening stops discharge.                                            |
| 5      | White           | Signal for abnormal High voltage                | Outputted when abnormal discharge occurs.                                                          |
| 6      | Orange          | Signal for abnormal sensing                     | Outputted when abnormal operation occurs on the surface electric potential sensor.                 |
| 7      | Red             | NC                                              | —                                                                                                  |
| 8      | Yellow          | Signal for static charge elimination completion | Notify the progress and completion of static charge elimination with ON and OFF signal to outside. |

【Note】 No. 6 and 8 only function when a surface electric potential sensor is used.

3. 3. When a surface electric potential sensor is used, remove the cover cap plugging a modular jack for indicating [signal] on ionizer body, and insert a modular plug of sensor cable IZS30-CS. A lever will snap when the modular plug is correctly locked Fix cables with a tie wrap or other measures in the vicinity of connection not to apply compulsive force to the modular jack and plug. (Direction of plugs on both sides of cable can be changed.)

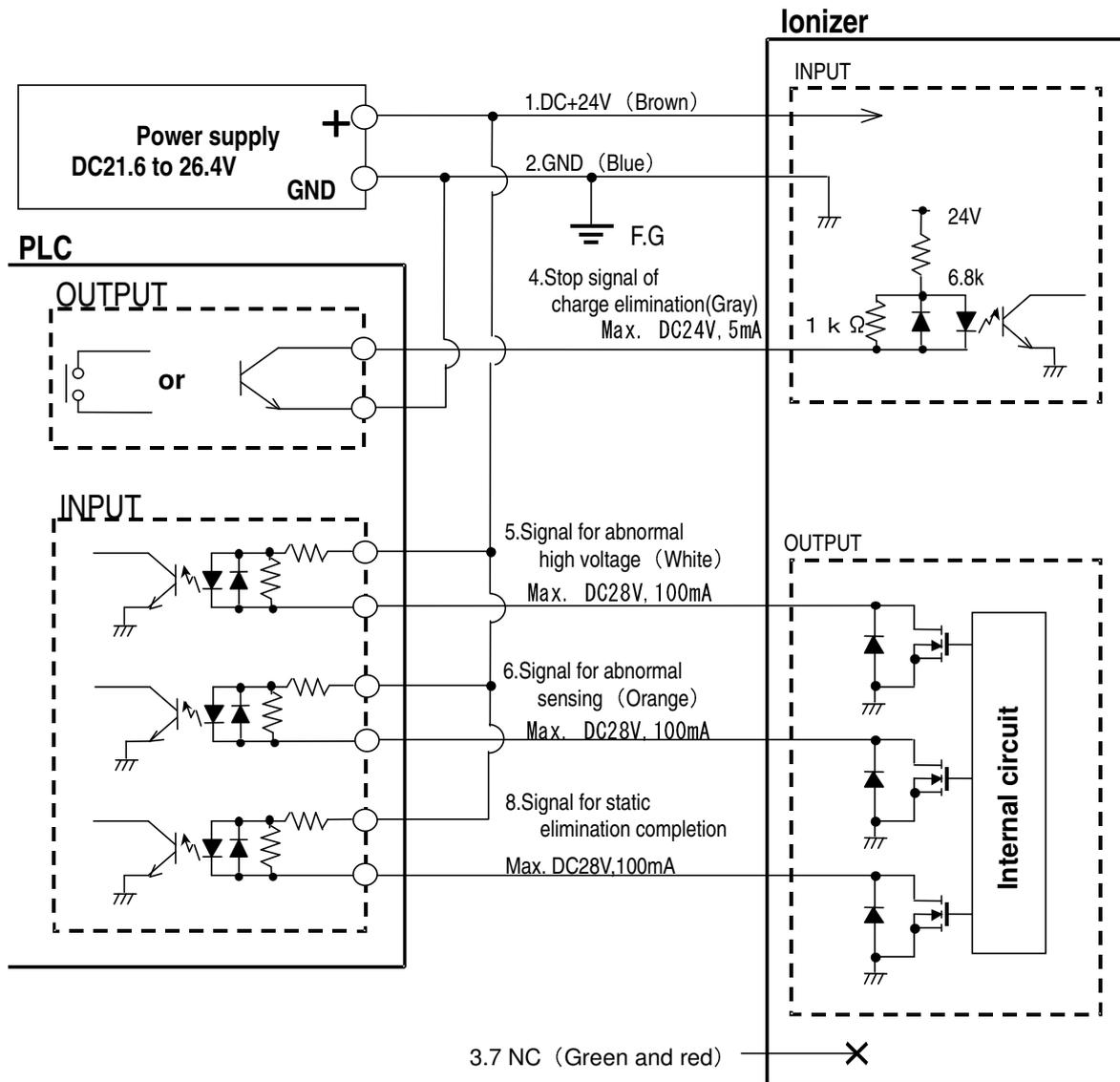


4. Insert the modular plug on the other side of sensor cable IZS30-CS into the modular jack of the electric potential sensor. If the modular plug is properly inserted and locked, a lever clicks to notify it's locked. Fix cables with a tie wrap or other measures in the vicinity of connection not to apply compulsive force to the modular jack and plug.



#### 4-4. Connection circuit

##### Ionizer (POWER connector)



- [Note 1] ( ) indicates the coating color for lead wire of dedicated cable
- [Note 2] Connect [4. Stop signal of static charge elimination] to GND when starting the ionizer operation.  
When the terminal is open, the operation will stop.
- [Note 3] [6. signal for abnormal sensor] and [8. signal for static charge elimination completion] functions only when the surface electric potential sensor is used.

##### Input and output operation list

| No | Name                                            | Lead wire color | Signal | Operation                                                                              |
|----|-------------------------------------------------|-----------------|--------|----------------------------------------------------------------------------------------|
| 4  | Stop signal of charge elimination               | Gray            | Input  | Connect 4 terminal to GND during operation<br>Discharge stops when terminal 4 is open. |
| 5  | Signal for abnormal High voltage                | White           | Output | Tr1 in ionizer is ON when abnormal signal is being sent.                               |
| 6  | Signal for abnormal sensing                     | Orange          | Output | Tf2 in ionizer is ON is conducted when abnormal signal is being sent.                  |
| 8  | Signal for static charge elimination completion | Yellow          | Output | Tr 3 in ionizer is ON when static charge elimination is completed.                     |

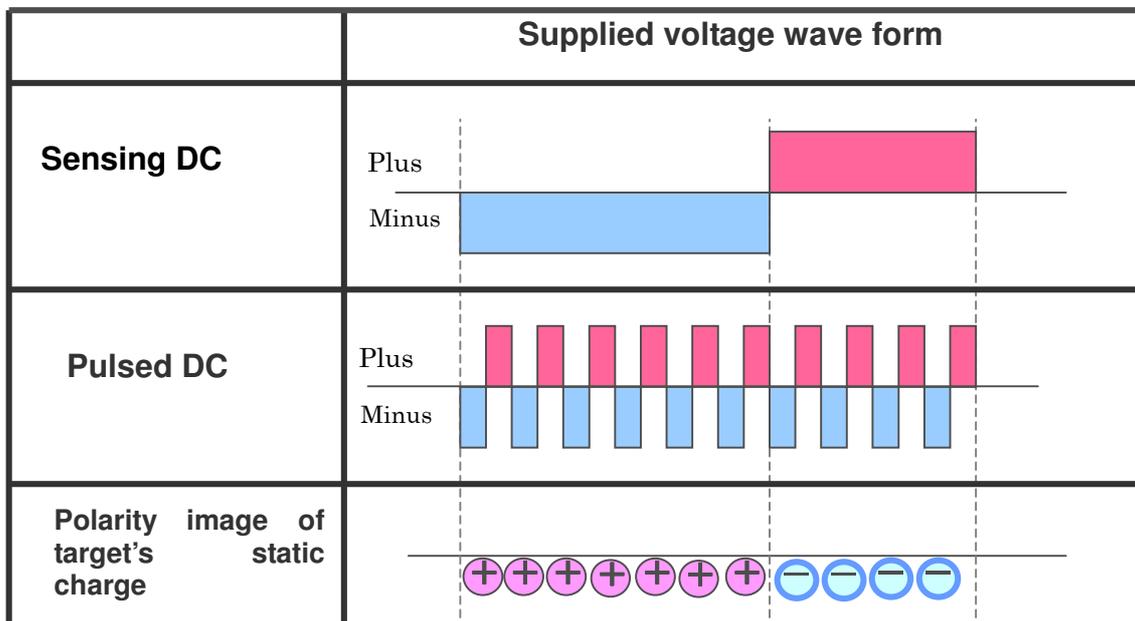
## 5. Function description

### 5-1. Operation mode

Three operation modes are available in IZS30. Use these modes depending on applications and operating conditions.

| Op. mode        | Operation                                                                                                                                                             | Features                                                                                                                                                                                                                                                                 | Precautions                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sensing DC mode | After surface electric potential sensor detects polarity and electric potential of the target's static charge, ionizer generates ion with anti-polarity continuously. | Can shorten static charge elimination time.<br>Decide if there is target's static charge and static charge elimination is completed, and automatically turn ON and OFF high pressure power supply and pneumatic valves. (Pneumatic valve has to be prepared separately.) | If surface electric potential sensor cannot tell the target's static charge as indicated below, proper static charge elimination might not be available.<br>- Large work with uneven static electricity.<br>- Work moving fast<br>- Work which size is smaller than sensing detection area.<br>- Static charge elimination of space or continuum                                                                                       |
| Pulsed DC mode  | Discharge plus and minus ion in the frequency of 1Hz to 33Hz by returns.                                                                                              | Although surface electric potential sensor cannot properly decide the target's static charge such as space or continuum, stable ion balance can eliminate the static electricity.                                                                                        | 1) Since static charge elimination result differs in the distance to the target's static charge and the operation conditions of air purge, it should be adjusted with an actual machine.<br>2) Even after static charge elimination is completed, surface potential on the work fluctuates in the regular frequency just under the ionizer. In case of selecting low frequency, amplitude of surface electric potential may get large. |
| DC mode         | Discharge plus or minus ion continuously.                                                                                                                             | Can be used to charge.                                                                                                                                                                                                                                                   | The parts other than the target's static charge should be grounded in order to prevent charging.                                                                                                                                                                                                                                                                                                                                       |

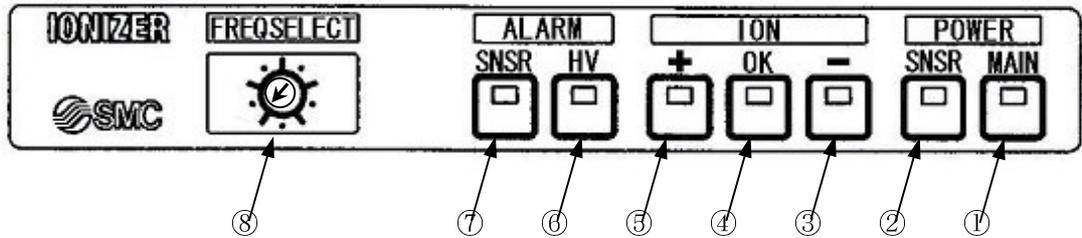
Supplied voltage wave form image diagram



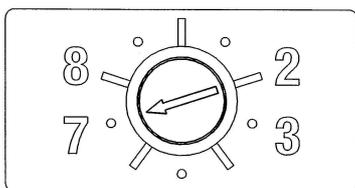
## 5-2. Output signal

| Signal type                                                                                      | Function                                                                                                                                |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Signal for static charge elimination completion (When surface electric potential sensor is used) | Output when static charge elimination is completed, or no target's static charge exists.                                                |
| Abnormal high voltage                                                                            | Output when any discharge probe gets shorted with other discharge probes or housing.                                                    |
| Abnormal sensing                                                                                 | Output when detecting hole of surface electric potential sensor is clogged with foreign substances, or sector doesn't rotate properly . |

## 5-3. Function description of indication



1. Power supply indication...Light on Green when power supply is turned ON.  
Blink when power supply voltage goes down to defined value.
2. Sensor indication.....Light on Green when surface electric potential sensor is connected
3. Minus indication.....Light on Blue while minus ion is being generated.
4. Indication for static charge elimination completion....Light on Green when static charge elimination is completed at sensing DC mode.
5. Plus indication.....Light on Orange while plus ion is being generated.
6. Indication for abnormal high voltage....Light on Red when abnormal current such as high Voltage leakage is generated.
7. Indication of abnormal sensing.....Light on Red when surface electric potential sensor cause malfunctions at sensing DC mode.
8. Ion Balance adjustment trimmer.....It's possible to adjust Ion Balance by using the driver made of the non-metal(Adjusted at shipment).  
we'll recommend the use of the measuring instrument.  
Though an accurate adjustment is possible by wear-out situation of needle, presence of dielectric thing and potential level of GND in the installation location
9. Frequency selecting switch.....Select frequency at pulsed DC mode.



- No
- 0----- 1Hz
  - 1----- 3Hz
  - 2----- 5Hz
  - 3----- 8Hz
  - 4----- 10Hz
  - 5----- 15Hz
  - 6----- 22Hz
  - 7----- 33Hz
  - 8----- + (Generate only plus ion)
  - 9----- - (Generate only minus ion)

## 6. Selection and setting of equipment

### 6-1. Sensing DC mode

1. selection of bar length  
Select the length applicable to work size base on [2. **static charge elimination area of 7-1. static charge elimination characteristics (reference)**]
2. Installation of ionizer body  
Installation of ionizer body: Install within 200mm to 2000mm from the target's static charge  
See data of [1. **Installation distance and static charge elimination time of 7-1. static charge elimination characteristics (reference)**] for static charge elimination time.
3. Installation of surface electric potential sensor  
Direct detecting hole to the charged face, and install it within 50mm from the target's static charge. (should be installed near the target's static charge as close as possible. )
4. Wiring  
Connect ionizer body and surface electric potential sensor with a dedicated cable.  
Connecting ionizer body and surface electric potential sensor automatically sets the mode to sensing DC mode.  
Power supply and each input/ output is wired with the dedicated cables. See [wiring table for power supply cable IZS30-CP of **4-3 cable connection**] **for wiring table.**
5. Pneumatic piping  
Since fitting with check valve is used, plug should not be connected on the other side even with single piping.  
Pipe  $\phi 4$  tube. See [3. **specifications**] for air flow rate.  
When piping is long, required flow rate might not be obtained without both-side piping.

### 6-2. Pulsed DC mode/ DC mode

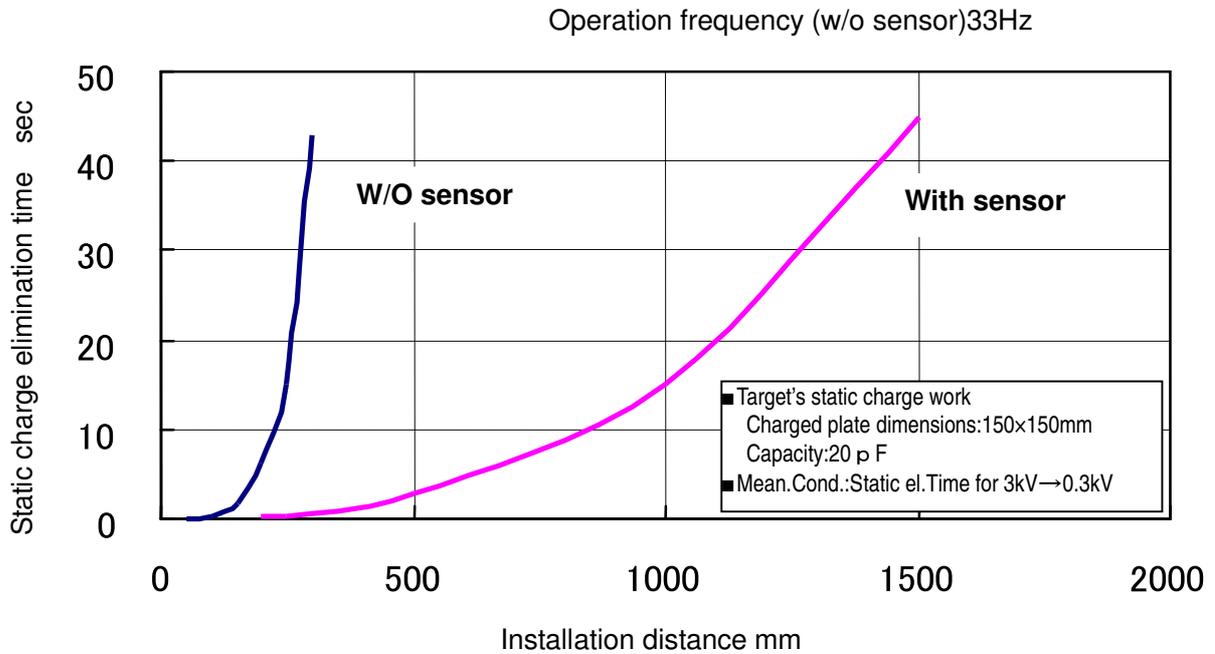
1. Selection of bar length  
Select the length applicable to work size base on [2. **static charge elimination area of 7-1. static charge elimination characteristics (reference)**]
2. Installation of ionizer body  
Install within 50mm to 2000mm from the target's static charge  
See data of [1. **Installation distance and static charge elimination time of 7-1. static charge elimination characteristics (reference)**] for static charge elimination time.
3. Selection of ion generation frequency  
Set selection switch with a screw driver referring to P1 『data on operating frequency and static charge elimination time』 .  
A screw driver slot for selection switch configures like a small arrow. Direct the tip of the arrow to  
the applicable position and set it.  
Setting the switch [8] or [9] shift the mode to DC mode, which discharges plus and minus continuously.
4. Wiring  
Connect ionizer body and surface electric potential sensor with a dedicated cable.  
Connecting ionizer body and surface electric potential sensor automatically switches the mode to sensing DC mode.  
Power supply and each input/ output is connected with the dedicated cables. See [wiring table for power supply cable IZS30-CP of **4-3 cable connection**] **for wiring table.**
5. Pneumatic piping  
Since fitting with check valve is used, plug should not be connected on the other side even with single piping.  
Pipe  $\phi 4$  tube. See [3. **specifications**] for air flow rate.  
When piping is long, required flow rate might not be obtained without both-side piping.

## 7. Technical data

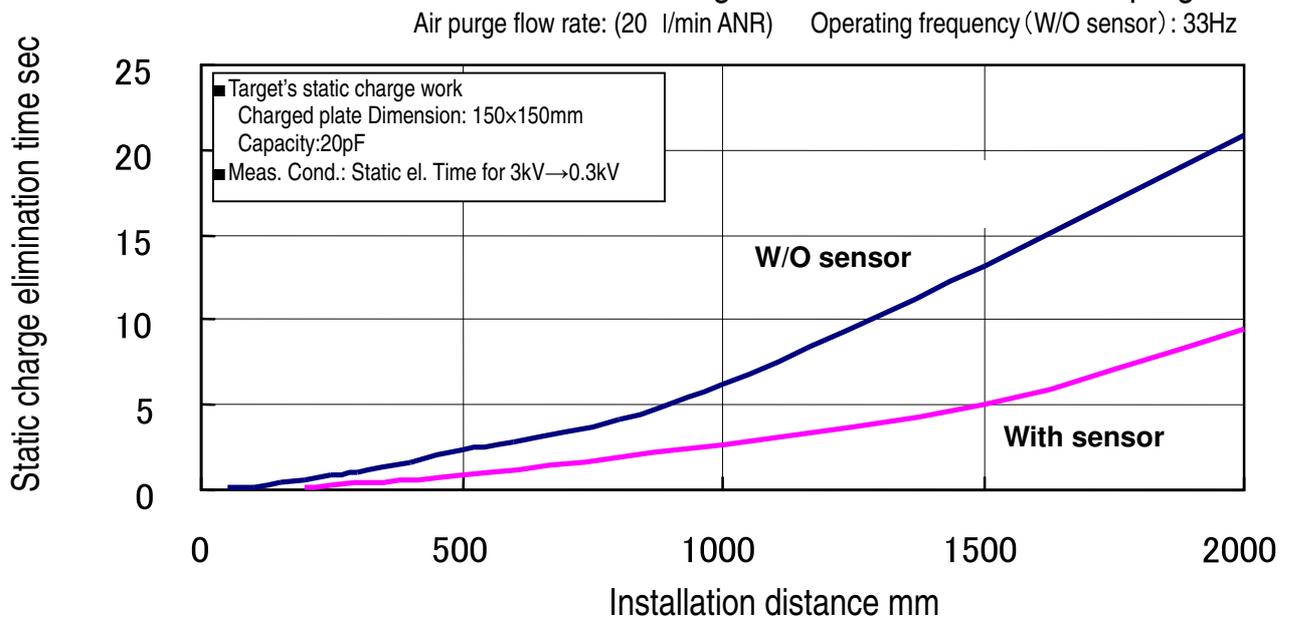
### 7-1. Static charge elimination characteristics (reference)

#### 1. Installation distance and static charge elimination time

Installation distance and static charge elimination time (W/O air purge)



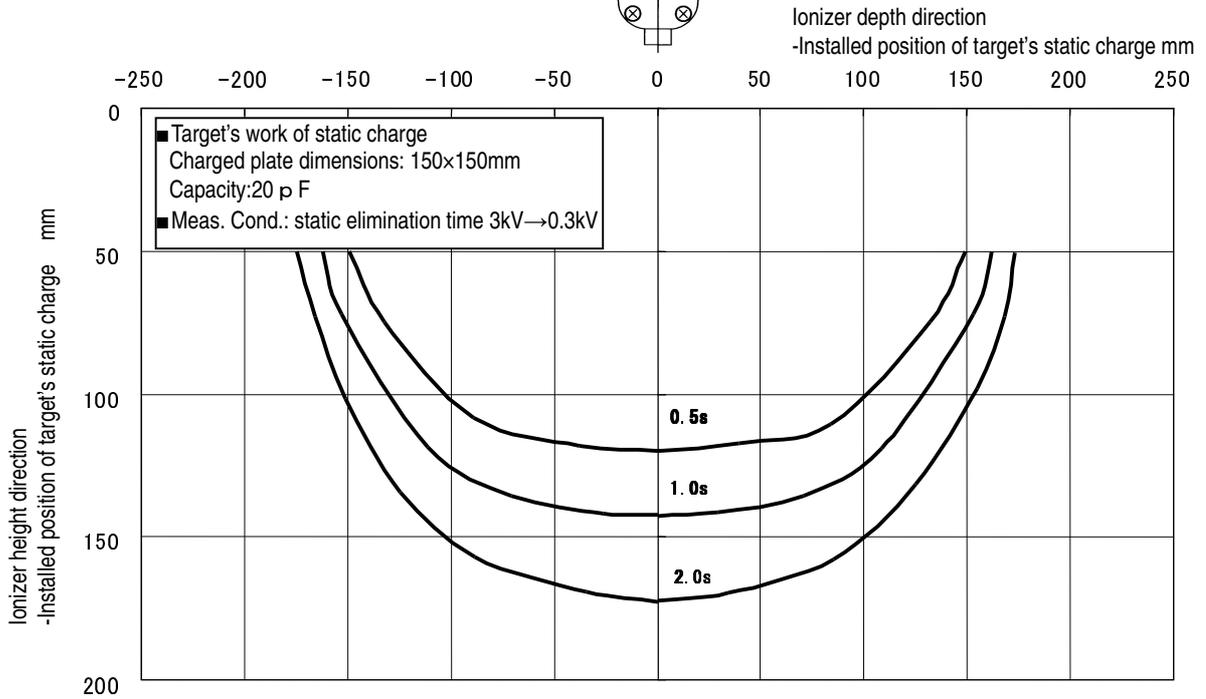
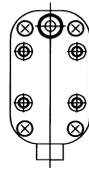
Installation distance and static charge elimination time (With air purge)



## 2. Static charge elimination area

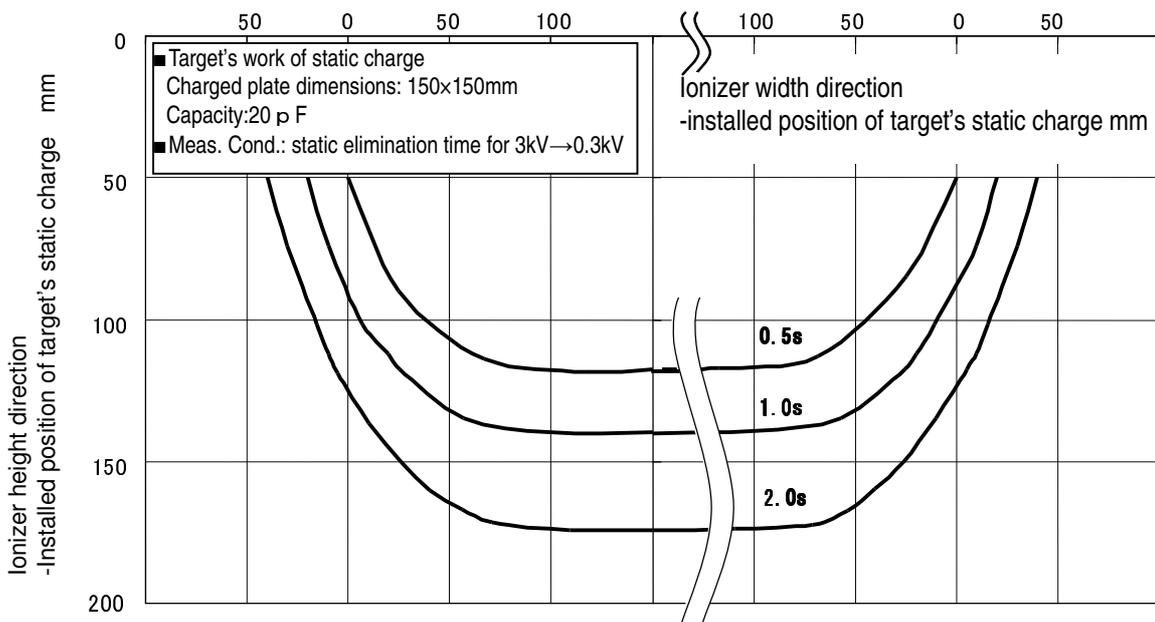
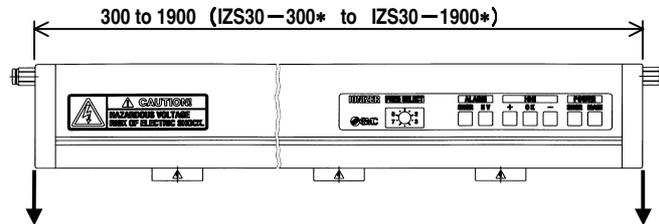
### Ionizer depth direction

Air purge : N/A  
 Surface potential Sensor : N/A  
 Op. Frequency: 33Hz



### Ionizer width direction

Air purge : N/A  
 Surface potential Sensor : N/A  
 Op. Frequency: 33Hz

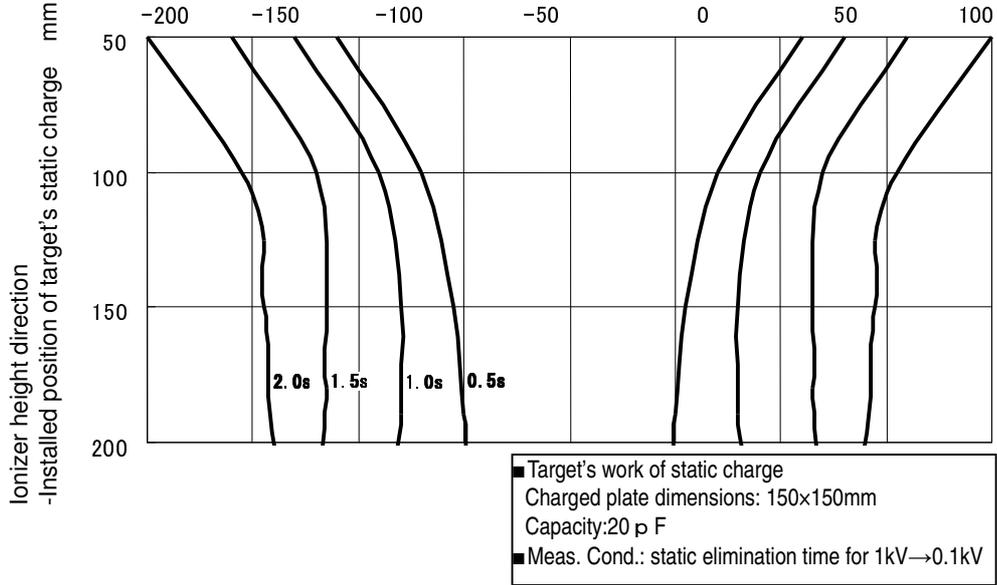


Ionizer depth direction (with air purge)

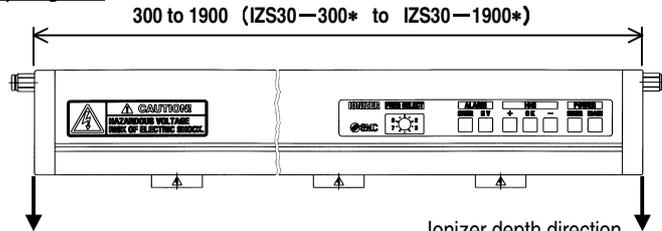
Air purge amount : 20l /min ANR  
 Surface potential Sensor : N/A  
 Op. Frequency: 33Hz



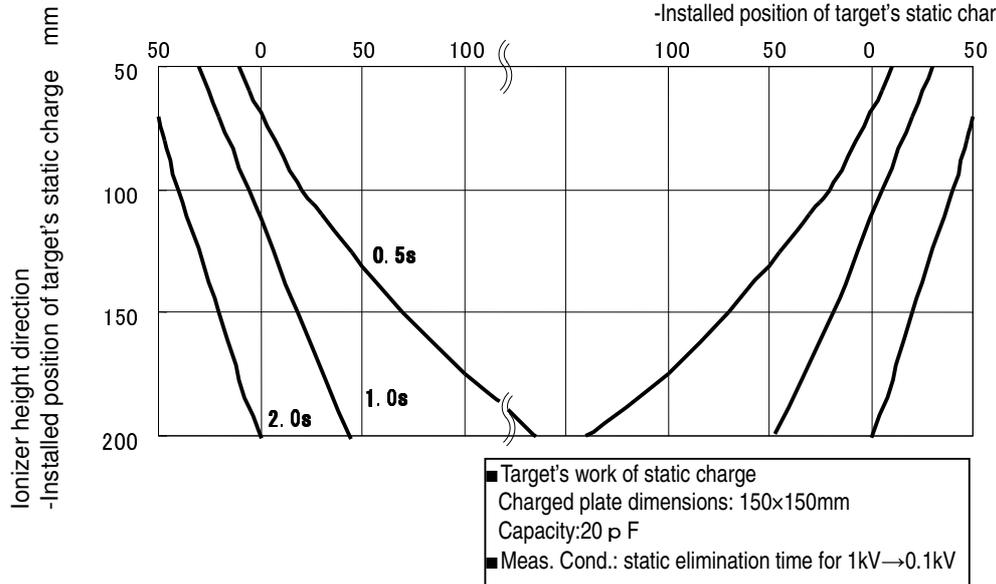
Ionizer depth direction  
 -Installed position of target's static charge mm



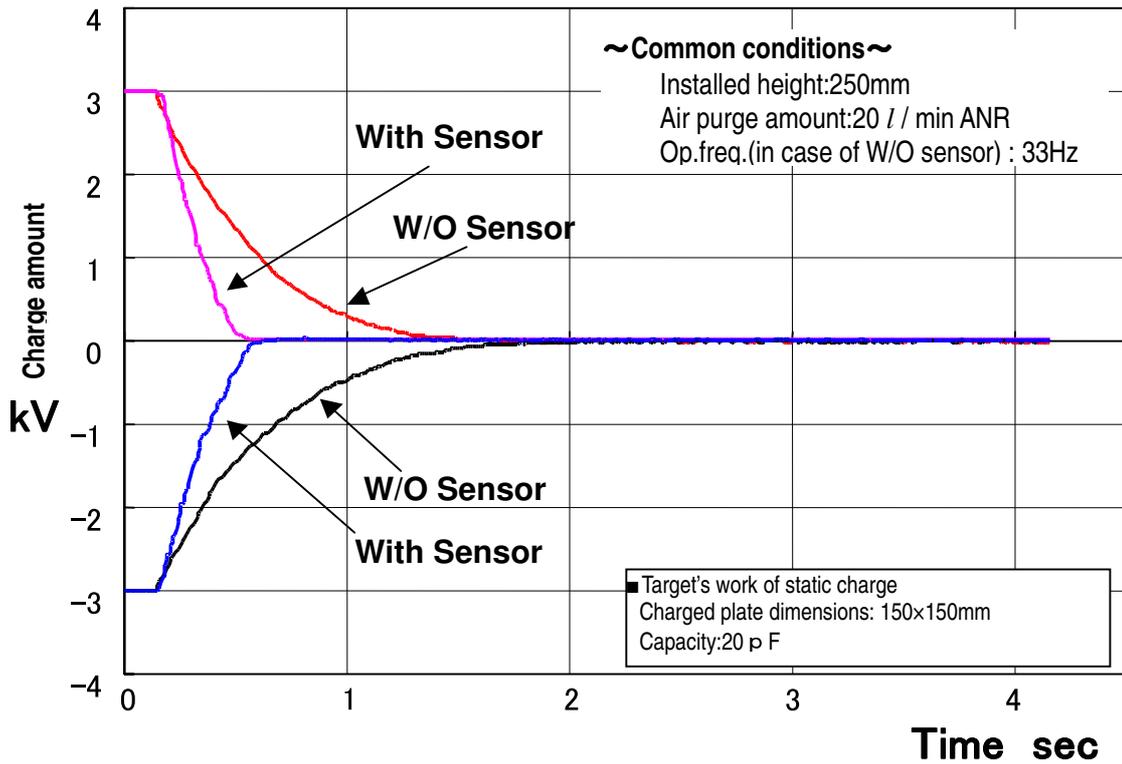
Ionizer width direction (with air purge)



Ionizer depth direction  
 -Installed position of target's static charge mm



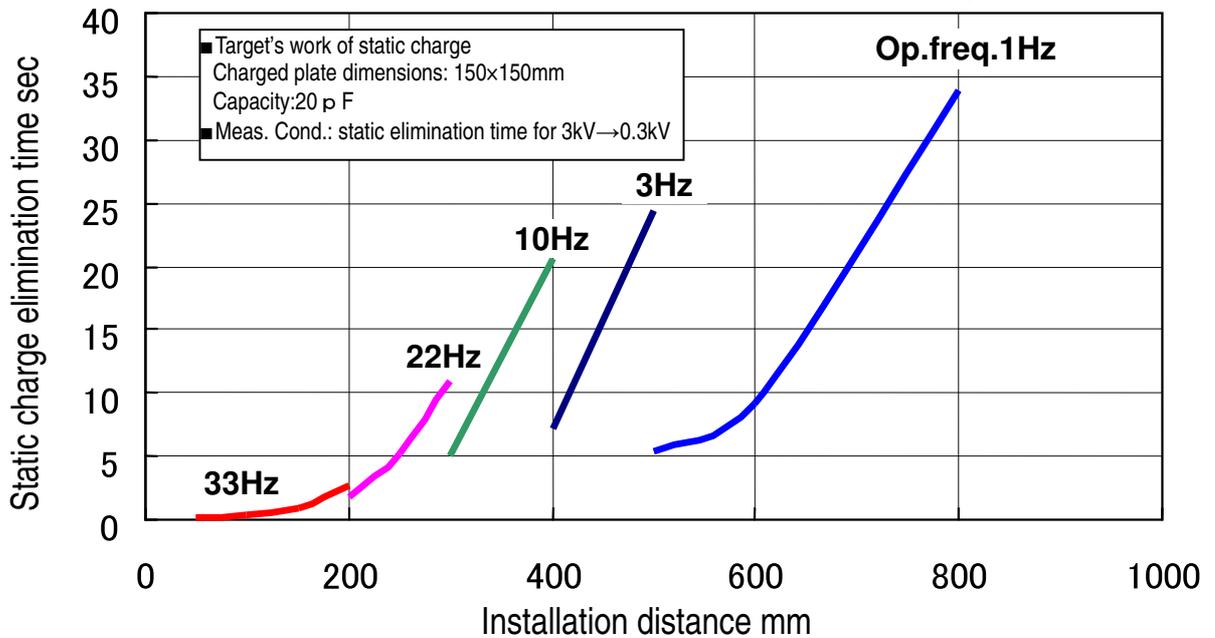
**Charged amount and static charge elimination time**



□ **Operating frequency and static charge elimination time (W/O surface electric potential sensor)**

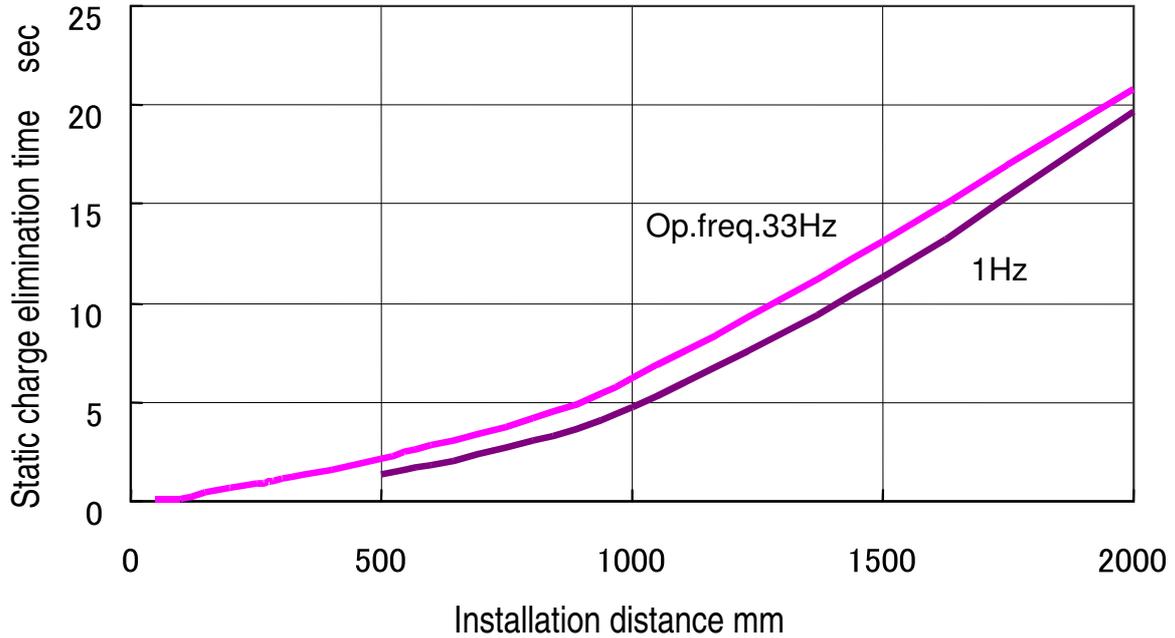
**Installation distance and static charge elimination time**

(Air purge:N/A)



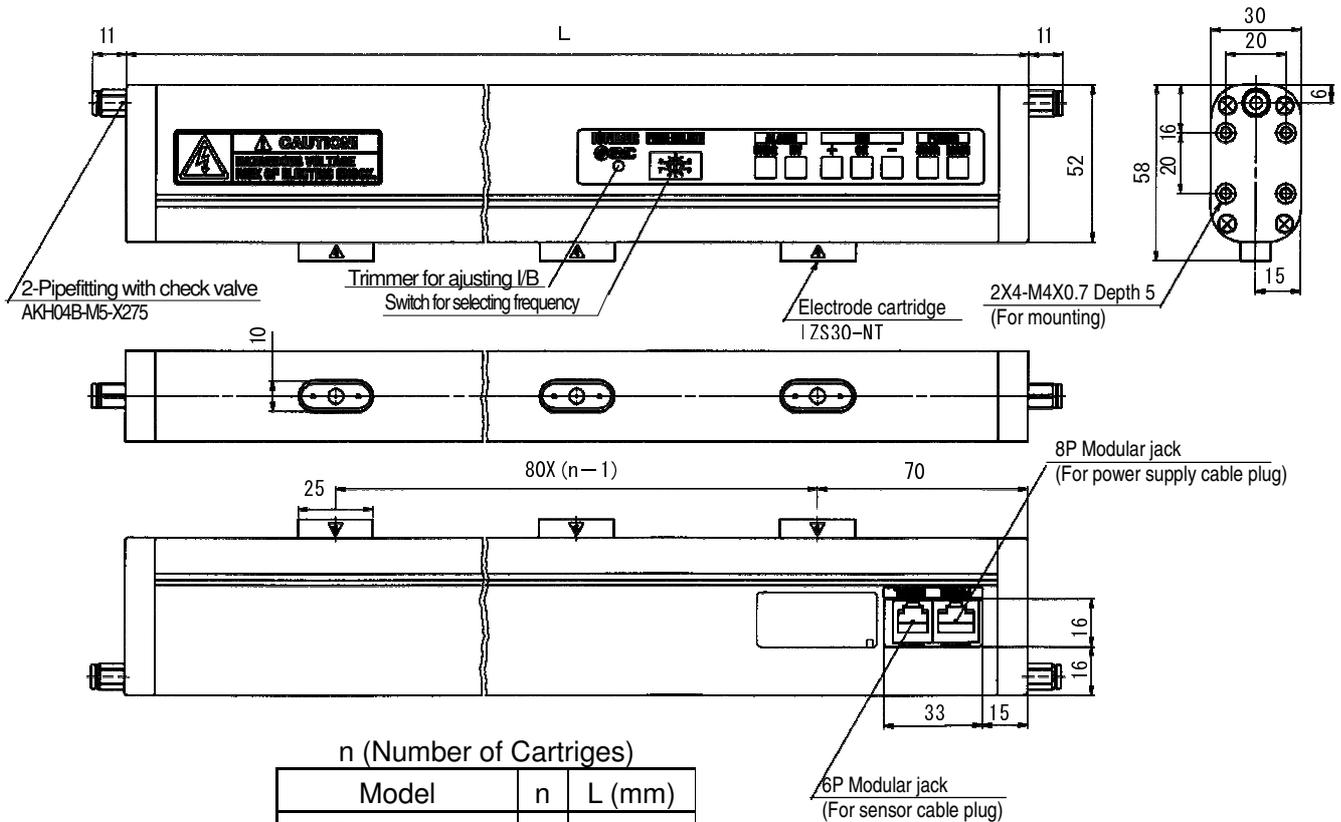
## Installation distance and static charge elimination time

(Air purge amount: Refer to Flow rate of air purge in 3. Specification)



### 7-2. Outline dimensions

#### 1. Ionizer (IZS30-\*\*)

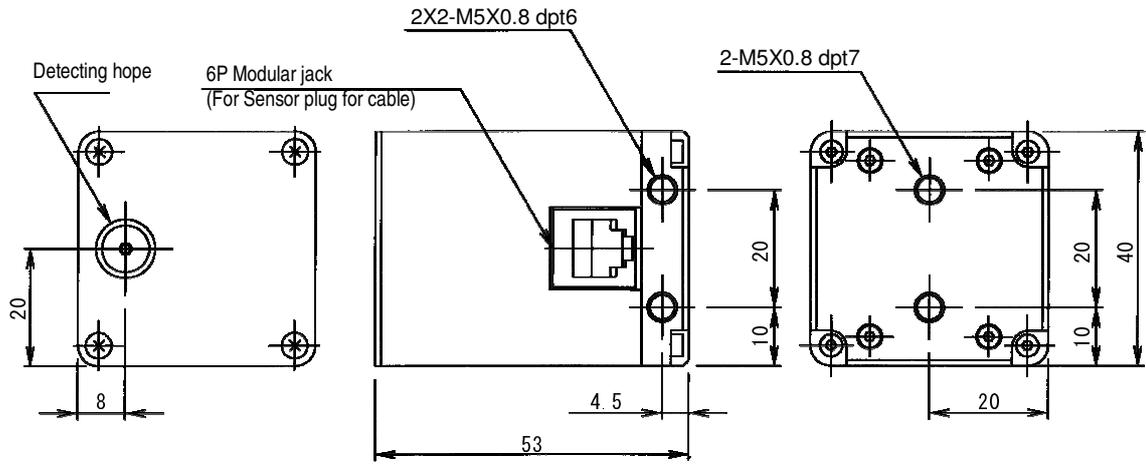


n (Number of Cartridges)

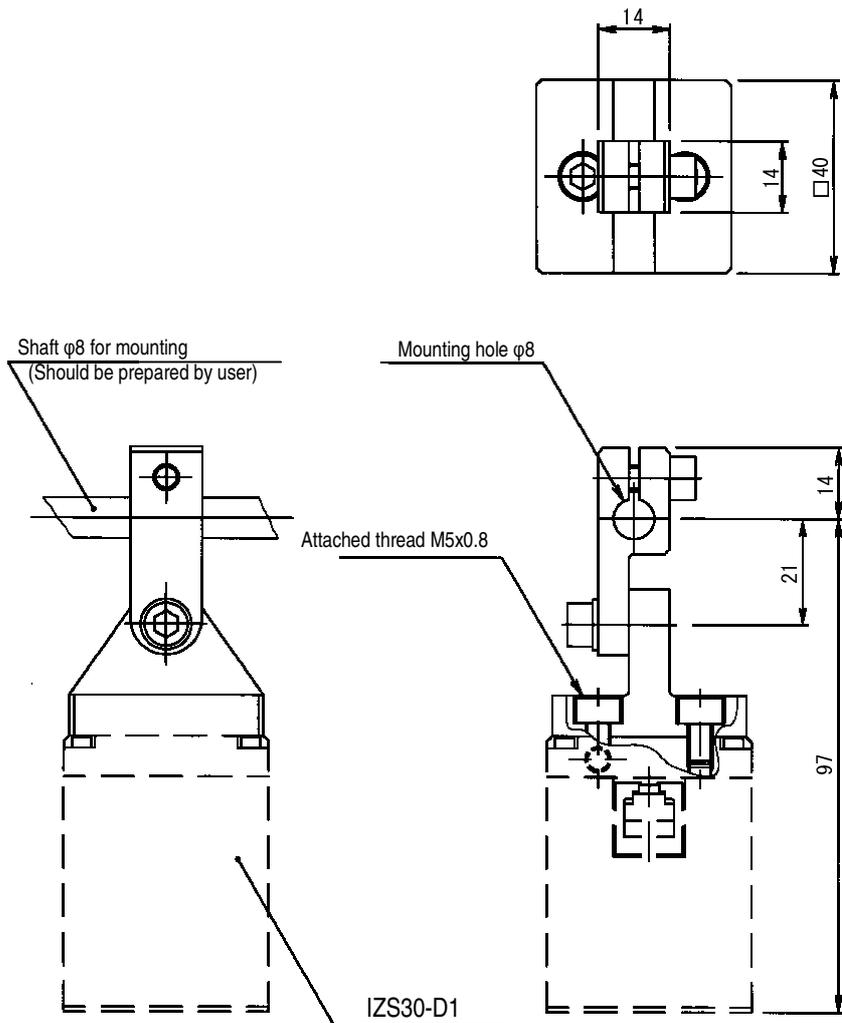
| Model        | n  | L (mm) |
|--------------|----|--------|
| IZS30-300**  | 3  | 300    |
| IZS30-780**  | 9  | 780    |
| IZS30-1260** | 15 | 1260   |
| IZS30-1500** | 18 | 1500   |
| IZS30-1900** | 23 | 1900   |



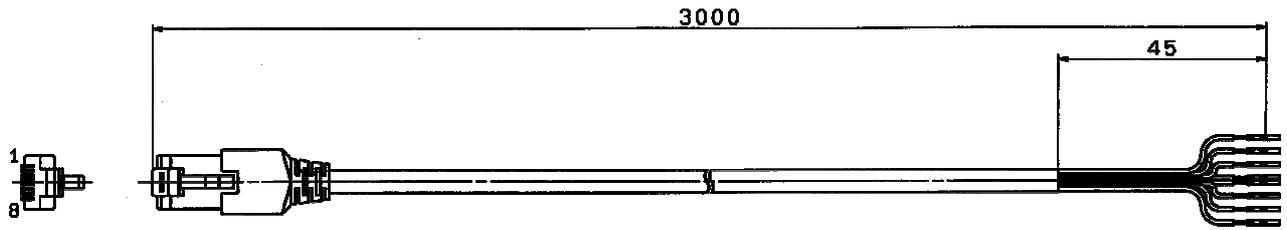
□ Surface electric potential sensor (IZS30-D1)



□ Sensor bracket (IZS30-BS)



□ Power supply cable (IZS30-CP)



□ Sensor cable (IZS30-CS)

