KEYENCE

96M00282

* 9 6 M 0 0 2 8 2 - 4 *

Ultra High-speed Sheath Sensing Ionizer

SJ-H(A)(V)(C) Series

SJ-H036*/060*/084*/108*/132*/156*/180*/204*/228*/252*/300*

Instruction Manual

Read this instruction manual before using the product in order to achieve maximum performance.
Keep this instruction manual in a safe place after reading it so that it can be used at any time.

■ Symbols

The following symbols alert you to important messages. Be sure to read these messages carefully.

⚠ Danger Failure to follow instructions may lead to death or serious injury.

⚠ Warning Failure to follow instructions may lead to injury.

⚠ Caution Failure to follow instructions may lead to product damage (product malfunctions, etc.).

Important Provides important precautions and restrictions on proper operation.

NOTE Provides additional information on proper operation.

Reference Provides useful information on proper operation.

Provides reference pages.

Indicates that the operation is done on the SJ-H01 Remote Control Console for the SJ-H* Series.

Safety Precautions

■ General precautions

⚠ Danger

- You must verify that the SJ-H* Series are operating correctly in terms of functionality and performance before the start and the operation of the SJ-H* series.
- We recommend that you take substantial safety measures to avoid any damage in the event of a problem occurring.
- KEYENCE never warrant the function or performance of the SJ-H* Series if it is used in a manner that differs from the SJ-H* Series specifications contained in this instruction manual or if the SJ-H* Series are modified by yourself.
- Do not use the SJ-H* Series for the purpose of protecting the human body.

■ Warnings and cautions specific to the SJ-H* Series

The SJ-H* Series is a high-voltage device that is not designed to be explosion proof. Before using the SJ-H* Series, be sure to read the following warnings and precautions carefully.

⚠ Danger

- Filling a closed space with nitrogen will reduce the oxygen levels in the air to dangerous levels.
  Make sure that there is adequate ventilation when using the SJ-H* Series in an enclosed space.
- Do not use the SJ-H* Series in the presence of flammable or explosive gases or elements.

⚠ Warning

- To avoid the risk of electric shock and ensure proper static elimination, be sure to completely ground the SJ-H* Series' 10-pin I/O cable.
- To avoid the risk of electric shock or product malfunctions, prevent water, oil, or flammable solvent from splashing onto the SJ-H* Series.
- To avoid the risk of electric shock or product malfunctions, keep fingers and metallic objects such as tools or wires away from the SJ-H* Series during operation.
- When the SJ-H* Series is used in an enclosed space, the generated ozone may become harmful.
  Make sure that there is adequate ventilation when using the SJ-H* Series in an enclosed space.
- Do not use the SJ-H* Series in a location in which the temperature changes suddenly, or where condensation occurs. This may lead to an accident or product breakdown.
- To avoid the risk of electric shock, do not operate the SJ-H* Series with wet hands.
- To avoid the risk of electric shock or product malfunctions, be sure to turn the power off during maintenance of the SJ-H* Series.
- To avoid the risk of injury, do not touch the electrode probes directly with your hands or fingers during maintenance.
- If any abnormality is observed in the SJ-H* Series, immediately turn off the power and contact the nearest KEYENCE office. Do not try to repair the SJ-H* Series by yourself. This may cause electric shock or product malfunctions.

⚠ Caution

- Do not touch the SJ-H* Series' electrode probes with hard objects such as tools. If the electrode probes are damaged, the SJ-H* Series does not operate properly, resulting in product malfunctions.
- Operate the control panel of the SJ-H* Series with the flat-blade screwdriver provided with the product.
- When mounting the SJ-H* Series, use the provided End units (L/R) and Auxiliary Support Part, otherwise product malfunctions may result.
- When the SJ-H* Series is used over a long time, dust accumulates on the electrode probes. Clean the electrode probes when the alarm indicator flashes. If you continue to use the SJ-H* Series with dust accumulating on the electrode probes, the SJ-H* Series will not operate properly, resulting in product malfunctions. Regular cleaning (about every 2 weeks) is recommended.
- Do not drop the SJ-H* Series or subject it to a strong impact. This may cause product malfunctions.
- Do not use the SJ-H* Series for any purpose other than eliminating static electricity.
- When the SJ-H* Series is used in combination with other instruments, functions and performance maybe degraded, depending on operating conditions and the surrounding environment.

■ Precautions for power supply

⚠ Caution

- Use a DC power supply at a rated supply voltage of 24 to 36 V.
- Noise conveyed through the power supply line may cause the SJ-H* Series to malfunction. Be sure to use a stabilized DC power supply with an insulated transformer.
- When using a commercially available switching regulator, be sure to completely ground switching regulator's frame ground terminal.
- Do not connect a number of power supplies to a single SJ-H* unit or more than one SJ-H* unit connected together, otherwise the power supplies will be short-circuited and product malfunctions may result.

■ Precautions for grounding

The 10-pin I/O cable for the SJ-H* Series is provided with a ground wire.

⚠ Caution

- For proper static elimination, be sure to completely ground the SJ-H* Series' grounding cable.
- The grounding cable must be grounded at a resistance not exceeding 100 Ω.

■ Warning labels on SJ-H* Series

For safety reasons, the warning labels are attached to the SJ-H* Series. Read each label carefully and follow the instructions on the labels.

■ Locations

⚠ Caution

To prevent product malfunctions, avoid installing the SJ-H* Series in the following locations.

- Locations in which the SJ-H* Series may be directly subjected to vibration or impact.
- Locations in which the ambient temperature drops below 0°C or exceeds + 40°C.
- Locations in which the relative humidity drops below 35% or exceeds 85%, or where condensation occurs.
- Locations in which the temperature changes suddenly.
- Locations in which the SJ-H* Series is exposed to a direct breeze from an air conditioner.
- Locations in which there are volatile, flammable substances or corrosive gas.
- Locations exposed to dust, salt, metal particles, or greasy fumes.
- Locations in which water, oil or chemicals may splash onto the SJ-H* Series.
- Locations in which a strong magnetic or electric field is generated.
- Locations where the altitude exceeds 2000 m.
- Outdoors

■ Other precautions

⚠ Caution

- Follow the warning instructions and cautions specified in this instruction manual.
- The SJ-H* Series uses an EEPROM. Do not turn off the unit while settings are made in the SJ-H* Series.

Precautions for CSA Certificate

The SJ-H* Series complies with the following CSA and UL standards, and has been certified by CSA.

CAN/CSA-C22.2 No.61010-1
Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

UL61010-1
Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

<Precautions>

- When selecting a power supply for use with the SJ-H* Series, always use a CSA/UL-listed power supply that either provides Class 2 output as defined in the Canadian Electrical Code/National Electrical Code, or that has been evaluated as a Limited Power Source as defined in CAN/CSA-C22.2 No. 60950-1/UL60950-1.
- Always establish a proper ground connections when installing the SJ-H* Series.
- Use only the cables provided by KEYENCE (power cables and connector cables) to connect SJ-H* Series units to one another or to their power supplies.
- Install the SJ-H* Series in accordance with the installation and wiring instructions described in this instruction manual. Never operate the SJ-H* Series with the ratings that does not conform to the specifications described in this instruction manual.
  * Seven units can be connected only when the 36 V power supply is used.
    Please contact the nearest KEYENCE office when the 24 V power supply is used.

Precautions for CE Marking

The SJ-H* Series complies with the following EU Directives and EN standards.

EU Directives
- EMC Directives (2004/108/EC)
- Low-voltage Directive (2006/95/EC)

EN Standards
- EN61326-1 Class A
- EN61010-1

<Precautions>

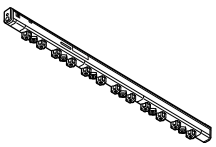
- Be sure to completely ground the SJ-H* Series' ground terminal when installing the SJ-H* Series.
- Overvoltage Category (Installation Category): I
- Pollution Degree: 2
- When selecting a power supply for use with the SJ-H* Series, always use a power supply that has been certified by a EU Notified Body (as a Limited Power Source as defined in EN60950).
- Use only the cables provided by KEYENCE (power cables and connector cables) to connect SJ-H* Series units to one another or to their power supplies.
- Install the SJ-H* Series in accordance with the installation and wiring instructions described in this instruction manual.Never operate the SJ-H* Series with the ratings that does not conform to the specifications described in this instruction manual.
  * Seven units can be connected only when the 36 V power supply is used.
    Please contact the nearest KEYENCE office when the 24 V power supply is used.

Checking the Package Contents

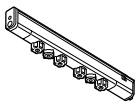
The package of SJ-H* Series includes the following items. Ensure that these items are included in your package before using the Unit. Extension cables and electrode probes for replacement are available as options.
See "List of Optional Accessories" (page 9).

Contents

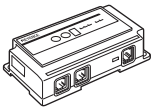
SJ-H060*/084*/108*/132*/156*/180*/204*/228*/252*/300* Controller-built-in Static Eliminator



SJ-H036* Static Elimination Bar



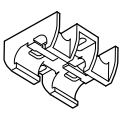
SJ-H036* Controller



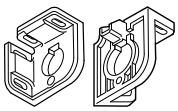
Electrode probe replacement kit

Auxiliary Support Part

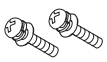
SJ-H036* : 0
SJ-H060* : 0
SJ-H084* : 0
SJ-H108* : 0
SJ-H132* : 1
SJ-H156* : 1
SJ-H180* : 1
SJ-H204* : 1
SJ-H228* : 2
SJ-H252* : 2
SJ-H300* : 2



End Units (L/R)



End Unit Securing Screws: 2

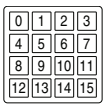


Instruction Manual

Flat-blade screwdriver

The CAUTION/WARNING labels in Japanese, German, French, Italian, and Chinese*1

ID number seal*1



*1 Use these language warning labels and ID number seals as needed.

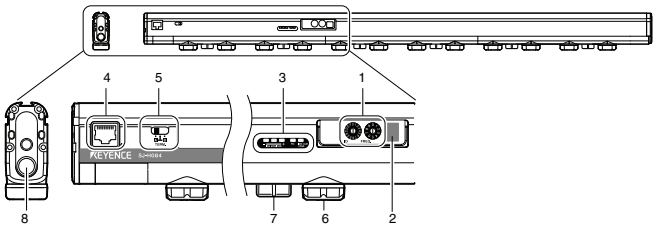
NOTE

The cables are sold separately.
See "Cables" (page 3).

Part Names

This section lists the part names of the SJ-H* Series. For details about the operation keys and indicators on the controller's front panel, see "Names and functions of operation keys, switches, and indicators".

Static elimination bar (Control panel)

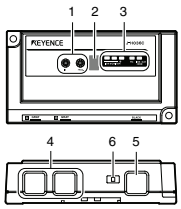


* The figure is for the SJ-H084*/108*/132*/156*/180*/204*/228*/252*/300*.
The position of Ion monitor of SJ-H060* is different from other models.
The position of it is located to the right side of Remote control infrared receiver.
SJ-H036* does not have 1 through 3 and 5.

1. Setting block (Not provided on SJ-H036*) (The ID switch is not provided on the SJ-HA Series)
2. Remote control infrared receiver (Not provided on the SJ-HA Series or SJ-H036*)
3. Indicator block (Not provided on SJ-H036*)
4. Cable connector (two on the SJ-H/HV/HC Series (except for SJ-H036*), and one on the SJ-HA Series and SJ-H036*)
5. Terminator switch (Not provided on the SJ-HA Series or SJ-H036*)
6. Electrode probe
7. Accelerating electrode probe (Not provided on the SJ-HA/HV/HC Series)
8. Air supply opening (Two on SJ-H036*/060*/084*/108*/132*/156*/180*/204*, and three on SJ-H228*/252*/300*)

Control panel (SJ-H036*)

1. Setting block (The ID switch is not provided on the SJ-H036A)
2. Remote control infrared receiver (Not provided on the SJ-H036A)
3. Indicator block
4. I/O Cable connector (Only one on the SJ-H036A)
5. Cable connector
6. Terminator switch (Not provided on the SJ-H036A)



Installation and Connection

This section explains how to set up and install the SJ-H* Series.
Before installation, carefully consider the operating conditions such as the distance between the static elimination bar and the target, or the time required for the elimination of the target's static charge.

Static elimination ability

■ Static elimination speed and operating distance

The SJ-H* Series offers a variety of frequency settings to enable flexible static elimination according to the location and application.
See "Frequency setting" (page 4).

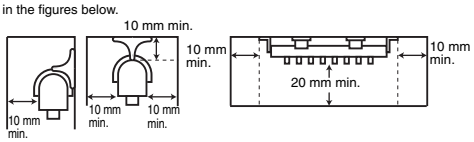
Static elmination speed	Location	Operating distance (mm)	Recommended frequency (Hz)
High-speed	Production lines of films or sheets (Short distance)	50-300	68, 47, 33, 22
	Clean bench (Middle distance)	300-1000	10, 8, 5
Low-speed	On ceiling of clean room (Long distance)	1000-2000	3, 1

Precautions for installation

■ Installation location

⚠ Caution

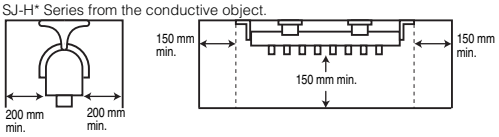
Refer to the following illustration to install the SJ-H* Series.
- Provide enough space between the static elimination bar and surrounding walls as shown in the figures below.



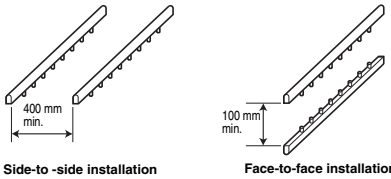
- When mounting the SJ-H* Series, use the provided end unit and auxiliary support part, otherwise an accident or malfunction may result.
- Be sure that the cable stays more than 10 mm away from the SJ-H* Series, otherwise an accident or malfunction may result.

■ Interference

The SJ-H* Series may not operate properly if there is any conductive object close to the SJ-H* Series or if another SJ-H* unit is installed closely together. Refer to the following illustration and isolate the SJ-H* Series from the conductive object.



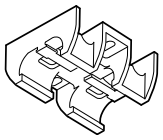
If two SJ-H* units are used, refer to the following illustration and separate the static elimination bars properly.



Side-to -side installation **Face-to-face installation**

■ Auxiliary support part (SJ-H132*/156*/180*/204*/228*/252*/300*)

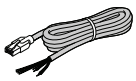
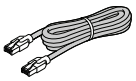
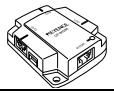
Install the SJ-H132*/156*/180*/204*/228*/252*/300* with auxiliary support part. Auxiliary support part prevents the static elimination bar from bending. Do not install the SJ-H132*/156*/180*/204*/228*/252*/300* without using auxiliary support part.



Type	No. of auxiliary support parts necessary for installation
SJ-H036*/060*/084*/108*	0
SJ-H132*/156*/180*/204*	1
SJ-H228*/252*/300*	2

■ Cables

The cables, including power cables and connector cables, required for the SJ-H* Series are not included in the package. Confirm the installation location before installing and make sure to buy the proper lengths of cables (10 pin I/O cable, 10-to-10-pin cable and 10-to-10-pin for SJ-H036* cables).

Item	Type	Appearance	Description
10-pin I/O cable	SJ-C2U SJ-C5U SJ-C10U		Power cable for the SJ-H* Series. Three types (2-, 5-, 10-m cables) are available. (Cable color :Gray)
10-to-10-pin cable	OP-42210 OP-42211 OP-42212		Cable for connecting the SJ-H* Series units. Three types (2-, 5-, 10-m cables) are available. This cable connects to the Relay Box as well. (Cable color :Gray)
10-to-10-pin cable for SJ-H036*	SJ-C2H SJ-C5H SJ-C10H		The cable that connects the SJ-H036* controller to the bar. Three types (2-, 5-, 10-m cables) are available. 10-pin I/O cable is necessary for supplying power. (cable color :Black)
Relay box for SJ-H*	OP-84296		This is required if the cables will extend more than 10 meters. (For use with the 10-to-10-pin cable)

Installing SJ-H* Series

■ Installing SJ-H* Series

Install the SJ-H* Series in places where a static problem occurs or may occur.

⚠ Caution

- When installing the SJ-H132*/156*/180*/204*/228*/252*/300*, mount and secure the auxiliary support parts with screws for the prevention of the static elimination bar from bending, otherwise the static elimination bar may be broken.
  See "Precautions for installation" (page 2).
- Keep a space of at least 10 mm around the static elimination bar after installation, otherwise the static elimination bar may malfunction or receive damage.

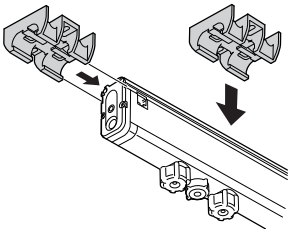
1 Mount the auxiliary support parts on top of the static elimination bar or along the guide rails.

The SJ-H132*/156*/180*/204* requires a single auxiliary support part, the SJ-H228*/252*/300* requires two auxiliary support parts. Mount them at approximately equal intervals.

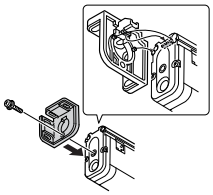
⚠ Caution

Confirm that the hooks on the auxiliary support part grasp the guide rails on the static elimination bar when installing.

- **Mounting from the side** - **Mounting from the top**

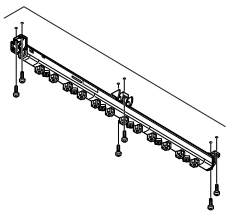


2 Attach the end unit to each end of the static elimination bar.



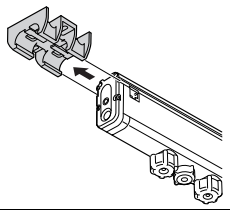
3 Secure the SJ-H* Series with M4 screws at the desired installation position.

When installing the SJ-H132*/156*/180*/204*/228*/252*/300*, secure the auxiliary support part with M4 screws as well.

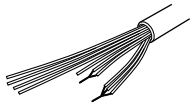


NOTE

When removing the auxiliary support part, be sure to remove it from the side along the guide rails.



Wiring diagram (SJ-C2U/C5U/C10U 10-pin I/O cable)



Cord color	Description
Brown	DC power supply (rated voltage of DC 24 to 36 V ±10 %) [The ends are soldered together before shipping]
Brown/White	
Blue	Power supply GND [The ends are soldered together before shipping]
Blue/White	
Pink	Static elimination interrupt input
Orange	Output signal GND
Black	Ion level alarm output
White	Condition alarm output
Gray	Alarm output
Shield wire (thick black wire)	Ground (Ground at a resistance not exceeding 100Ω)

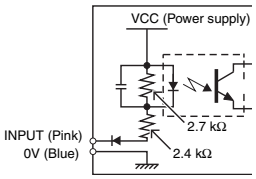
* The blue wire and orange wire are insulated from each other.
* Be sure install both of the brown and brown/white wires and blue and blue/white wires.

⚠ Caution

Do not short-circuit the output signal wire and output signal GND wire together without any load, otherwise the internal circuit will be damaged, which may result in product malfunctions, because the SJ-H* Series does not have any overcurrent protection circuit.

■ Input circuit

[Pink (Static Elimination Interrupt Input)]



Apply NPN open collector input to the INPUT and 0 V terminals from non-voltage contacts (such as relays).

■ Output circuit

Photo Relay Output [Gray (Alarm Output)]

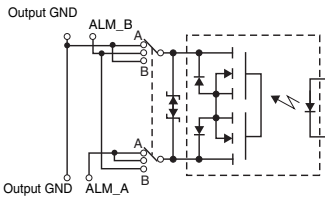
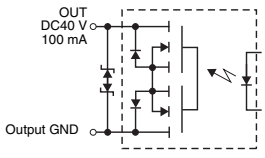


Photo Relay Output [Black (Ion Level Alarm Output), White (Condition Alarm Output)]



Connection of power supply

■ Connecting SJ-H060*/084*/108*/132*/156*/180*/204*/228*/252*/300* to power supply

A 10-pin I/O cable (sold separately) is required to connect the SJ-H060*/084*/108*/132*/156*/180*/204*/228*/252*/300* to power supply.

See "Terminator switch setting" (page 6).

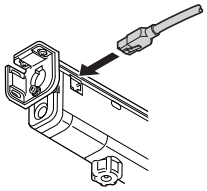
1 **See "Wiring diagram" (page 3) and connect each wire of the 10-pin I/O cable.**

⚠ Caution

- For proper static elimination, the ground wire must be grounded at a resistance not exceeding 100Ω.
- Use a DC power supply with a marginal output (at least 500 mA) at a rated voltage of 24 to 36 V.
- Do not connect a number of power supplies to a single SJ-H* unit or more than one SJ-H* unit connected together, otherwise the power supplies will be short-circuited an accident or malfunction may result.

2 **Connect the modular connector of the 10-pin I/O cable to the SJ-H060*/084*/108*/132*/156*/180*/204*/228*/252*/300*.**

A 10-pin cable connector each is provided to the front and back of the SJ-H060*/084*/108*/132*/156*/180*/204*/228*/252*/300*. (for the SJ-HA Series, it is provided only to the front) The connector will snap when it is connected correctly.



NOTE When connecting the SJ-H/HV/HC Series, set the terminator switch according to the cable connector to be used. If the terminator switch is not set correctly, alarm output will not output correctly.

See "Terminator switch setting" (page 6).

⚠ Caution

- Press the tab of the modular connector to disconnect the cable. Do not pull the cable without pressing the tab, otherwise the cable may be damaged.
- Keep a space of at least 10 mm around the static elimination bar after installation, otherwise the static elimination bar may malfunction or receive damage.

■ Connecting SJ-H036* to power supply

A 10-pin I/O cable and a 10-to-10-pin cable (both sold separately) are required to connect the SJ-H036* to power supply.

See "Terminator switch setting" (page 6).

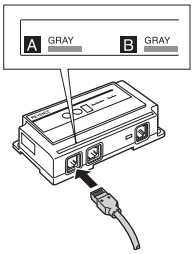
1 **See "Wiring diagram" (page 3) and connect each wire of the 10-pin I/O cable.**

⚠ Caution

- For proper static elimination, the ground wire must be grounded at a resistance not exceeding 100 Ω.
- Use a DC power supply with a marginal output (at least 500 mA) at a rated voltage of 24 to 36 V.
- Do not connect a number of power supplies to a single SJ-H* unit or more than one SJ-H* unit connected together, otherwise the power supplies will be short-circuited an accident or malfunction may result.

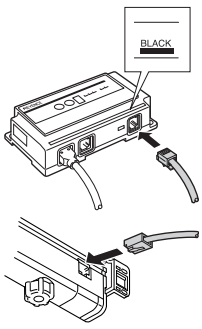
2 **Connect the modular connector of the 10-pin I/O cable to the SJ-H036* controller.**

The SJ-H036* controller has two 10-pin cable connectors indicated GRAY (the SJ-H036A only has one), either one of which can be used.
The connector will snap when it is connected correctly.



3 **Connect the SJ-H036* controller and the static elimination bar over the 10-to-10-pin cable.**

Connect the cable to the connector marked by the word "BLACK." Then connect the cable to the static elimination bar of the SJ-H036*.
The connector will snap when it is connected correctly.



NOTE When connecting the SJ-H/HV/HC Series, set the terminator switch according to the cable connector to be used. If the terminator switch is not set correctly, alarm output will not output correctly.

See "Terminator switch setting" (page 6).

⚠ Caution

- Press the tab of the modular connector to disconnect the cable. Do not pull the cable without pressing the tab, otherwise the cable may be damaged.
- Keep a space of at least 10 mm around the static elimination bar after installation, otherwise the static elimination bar may malfunction or receive damage.

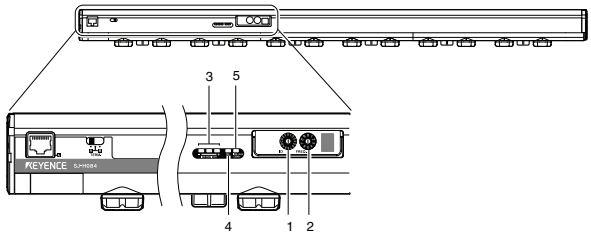
NOTE The SJ-H036* static elimination bar and controller should bear the same serial number. Check that they bear the same serial number when connecting them.

Static Elimination Setting

This section provides the name and functions of operation keys, switches, and indicators on the controller's front panel. It also describes the operation procedure for the static elimination setting.

Names and functions of operation keys, switches, and indicators

The control panel of the SJ-H084*/108*/132*/156*/180*/204*/228*/252*/300* has the same layout.
The control panel of the SJ-H060* and SJ-H036* has the setting switch and LED positions swapped.

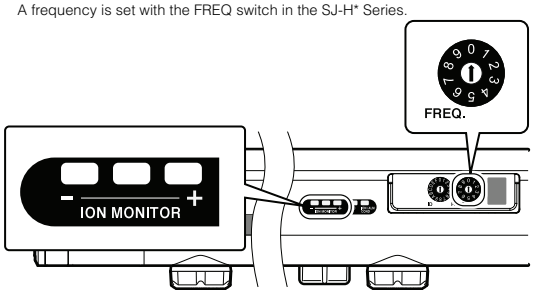


1. ID switch..... Sets the ID number if the SJ-H* unit is used with another SJ-H* unit. (The SJ-HA Series does not have this switch)
2. FREQ switch..... Sets the frequency
3. ION MONITOR ... Displays the strength of the electric charge of the object. If the SJ-H01 is used, the quantity of ion generation will be displayed.
4. RC Control/Setting Indicator
   ..... This flashes when the SJ-H* Series is being controlled via remote control, during Dual I.C.C. confirmation and when the L.P.C. function is in use. (This cannot be used on the SJ-HA Series)
5. Alarm Indicator... This flashes once per second if static elimination power is affected by situations such as an absorption of ions by surrounding metals, which can cause instability of the setting environment (temperature, humidity, surrounding metals).
   (Condition alarm) This will blink twice per second if the ion generation capability falls below the set value due to wear or dirt on the electrode probe.
   (Ion level alarm) Flashes if the quantity of ion generation is low due to the deterioration of the electrode probes or the dirt on the electrode probes. Then static elimination will be forcibly turned OFF. (Alarm)

Frequency setting

SJ-H Series | SJ-HA Series | SJ-HV Series | SJ-HC Series

A frequency is set with the FREQ switch in the SJ-H* Series.



When the frequency setting is made, the indicator for the present frequency on the ION MONITOR will flash for approximately five seconds. Then the indicator will be turned OFF.

Frequency	FREQ. switch	ION MONITOR
68Hz	0	OFF OFF Green
47Hz	1	OFF OFF Yellow
33Hz	2	OFF OFF Red
22Hz	3	OFF Green OFF
10Hz	4	OFF Yellow OFF
8Hz	5	OFF Red OFF
5Hz	6	Green OFF OFF
3Hz	7	Yellow OFF OFF
1Hz	8	Red OFF OFF
For remote control console *	9	—

* This cannot be used on the SJ-HA Series.

For frequency settings in detail, see "Static elimination ability" (page 2).

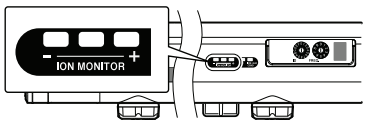
Other Functions

This section describes other functions such as the display function, alarm output function, and air purge function.

Indicators

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

The target's static charge and the quantity of ions generated from the static elimination bar are displayed on the ION MONITOR.



■ Electric charge indicator

The ION MONITOR works as an electric charge indicator that displays the target's static charge, polarity of the static charge, and condition of static elimination.
The plus and minus side LEDs will illuminate in response to the current charge level.
When static elimination is finished, the indicator in the middle will be illuminated. Therefore, the user will know the process of static elimination.

ION MONITOR	Condition
OFF OFF Red	Positively charged object — High
OFF OFF Yellow	Middle
OFF OFF Green	Low
OFF Green OFF	
Green OFF OFF	Low
Yellow OFF OFF	Middle
Red OFF OFF	High — Negatively charged object

■ Ion quantity indicator

The ION MONITOR works as an ion quantity indicator as well, and continuously monitors the quantity of ions generated from the static elimination bar and displays the measurement in the colors of the LED.
When leftmost and rightmost indicators are illuminated green, it means that on the SJ-H* Series is fully generating ions.
* This cannot be used on the SJ-HA Series.

ION MONITOR	Condition
Green OFF Green	Large quantity of ion
Yellow OFF Yellow	
Red OFF Red	
OFF Red OFF	Small quantity of ion

When the SJ-H01 Remote Control Console is used to set continuous generation of positive (or negative) ions, only two indicators on the positive (or negative) side will be illuminated.
The ION MONITOR does not display the target's static charge or condition of static elimination.
* This cannot be used on the SJ-HA Series.

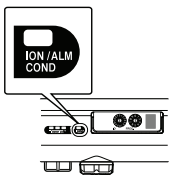
ION MONITOR	Condition
OFF Red Red	Continuous positive ion generation
Red Red OFF	Continuous negative ion generation

Alarm output function

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

■ Alarm function (ALM)

The ION/ALM/COND indicator will flash red three times per second and an alarm signal (N.C. control signal) will be output if the internal circuit is damaged or an abnormal electrical discharge occurs.
Then the SJ-H* Series will stop generating ions.
Alarm output will activate regardless of whether or not static elimination is being interrupted manually or forcibly.



■ Ion level alarm function (ION)

The ION/ALM/COND indicator will flash twice per second and an alarm signal (N.O. control signal) will be output if the quantity of ion generation is low due to the deterioration of the electrode probes or the dirt on the electrode probes. Static elimination will not be interrupted in this case. By using the SJ-H01 Remote Control Console, the warning output can be adjusted in four levels according to the quantity of ions generated. (The warning output cannot be adjusted on the SJ-HA Series).
The ion level warning can be a notice for the maintenance of the electromagnetic probes. Static elimination continues, so make sure to turn off the power when you perform maintenance on the electromagnetic probes.

■ Condition alarm function (COND)

The ION/ALM/COND indicator will flash once per second and an alarm signal (N.O. control signal) will be output if the installation environmental conditions (e.g., the temperature, humidity, and ambient metal) are unstable and likely to affect the performance of static elimination adversely (e.g., the absorption of ions) caused by ambient metal objects. Static elimination will not be interrupted in this case. By using the SJ-H01 Remote Control Console, the warning output can be adjusted in four levels according to the installation environment. (The warning output cannot be adjusted on the SJ-HA Series)

Elimination interruption function

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

For the purpose of energy saving, by short-circuiting the blue (DC GND wire) and pink (static elimination interruption input signal wire) wire terminals of the 10-pin I/O cable, only the static elimination function will be turned OFF without turning off the SJ-H* Series.

Air-purge function

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

Supplying clean air through the air duct on both ends of the static elimination bar will prevent the dust accumulation on the electrode probes. The air purge widens the static elimination area and increases the speed of static elimination as well.
* The air pressure indicates the pneumatic value at the route of the joint.
* Please contact the nearest KEYENCE office when using the air-purge function with intermittent air supply.

⚠ Danger

Filling a closed space with nitrogen will reduce the oxygen levels in the air to dangerous levels.
Make sure that there is adequate ventilation when using the SJ-H* Series in an enclosed space.

⚠ Caution

- Check that the air pressure does not exceed 0.5 MPa, otherwise an accident or malfunction may result.
- Please contact the nearest KEYENCE office when opening and closing the air duct.
- Be sure to provide clean, dry air to the static elimination bar. If the air contains water or oil, air leaks or electrical discharges may occur in the static elimination bar, thus resulting in accidents or malfunctions.
- Be sure to supply air from both sides (2 locations) of the SJ-H036*/060*/084*/108*/132*/156*/180*/204*.
- Be sure to supply air from both sides (3 locations) of the SJ-H228*/252*/300*.

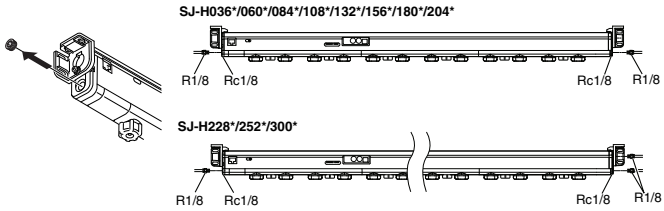
Provide clean, dry air free of organic matter at a condensation point of -25 °C and approximately 0.01 μm in mesh size.

■ Air supply method

As shown in the illustration below, remove the screw that block the air duct on either end of the static elimination bar, connect a joint to the air duct, and provide air.

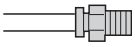
⚠ Caution

- Be sure to limit the tightening torque to 1.2 N•m (12 kg•cm^2) or less. Otherwise, an accident or product breakdown may occur.
- Be sure to supply only clean, dry air. The use of improper air may cause an accident or product malfunctions.
- Be sure to supply air from both sides (2 locations) of the SJ-H036*/060*/084*/108*/132*/156*/180*/204*.
- Be sure to supply air from both sides (3 locations) of the SJ-H228*/252*/300*.



Recommended joint
The recommended joint is the Tube Fitting (tube diameter : ϕ 8 mm) manufactured by Pisco Co.

Tube diameter ϕ 8 mm : PC8-01



NOTE

- Use a joint having a tube diameter of 8 mm on the SJ-H* Series.
- When providing air to more than one SJ-H* unit, check that each static elimination bar is provided with air. If the air supply source is one, each static elimination bar may not be provided with enough air.

Air booster

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

An optional air booster can be mounted to the SJ-H Series.
By using the air booster, the static elimination speed can be improved and the static elimination range can be expanded.
For more details, see the air booster Instruction Manual.
* The air booster cannot be used with SJ-HA/SJ-HV/SJ-HC Series.
* Please contact the nearest KEYENCE office when using the air-purge function with intermittent air supply.

⚠ Danger

Filling a closed space with nitrogen will reduce the oxygen levels in the air to dangerous levels.
Make sure that there is adequate ventilation when using the SJ-H* Series in an enclosed space.

⚠ Caution

- Check that the air pressure does not exceed 0.5 MPa, otherwise an accident or malfunction may result.
- Please contact the nearest KEYENCE office when opening and closing the air duct.
- Be sure to provide clean, dry air to the static elimination bar. If the air contains water or oil, air leaks or electrical discharges may occur in the static elimination bar, thus resulting in accidents or malfunctions.
- Be sure to supply air from both sides (2 locations) of the air booster.

Provide clean, dry air at a condensation point of -25 °C and approximately 0.01 μm in mesh size.

Laminar flow assisting part

SJ-H Series SJ-HA Series **SJ-HV Series** SJ-HC Series

The optional laminar flow assisting part can be installed to the SJ-HV Series.
The laminar flow assisting part shows its maximum power when eliminating static electricity under the downflow in a clean room without disturbing the laminar flow.
For details, see the Instruction Manual of the laminar flow assisting part.

* The SJ-H/HA/HC Series cannot use the laminar flow assisting part.

Abnormal discharge detection function

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

The SJ-H* Series detects abnormal electric discharge caused by the condensation on the tips of the electrode probes or conductive objects that may come close to the electrode probes, thus interrupting the generation of ions and prevent the occurrence of trouble.

L.P.C. function

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

This function is used to reduce the amount of foreign matter adhering to the electrode probes when the air purge function is not used. It controls the supply of high voltage so that application of high voltage to the electrode probes is interrupted for a fixed cycle. In this way, the adhesion of foreign matter to the electrode probes is prevented.

Settings for SJ-H* Units in Coupled Operation

This section explains how to make settings for SJ-H* units used in coupled operation.

* The SJ-HA Series can be coupled in parallel by using the relay box.

Frequency setting

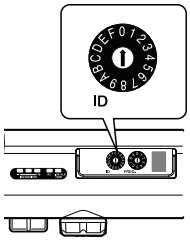
SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

When using SJ-H* units in coupled operation, set a unique frequency for each SJ-H* unit individually.

ID number setting

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

When using SJ-H/SJ-HV/SJ-HC units in coupled operation, it is convenient to set a unique ID number for each unit individually. The ID number of the SJ-H/SJ-HV/SJ-HC Series is set to 0 before shipping. The ID number can be set in hexadecimal between 0 and F (i.e., 16 in total). Turn the ID Switch with the provided flat-blade screwdriver to set the ID number.



SJ-H* Series ID number switch	0-9	A	B	C	D	E	F
Remote control ID number key and ID number seal	0-9	10	11	12	13	14	15

By setting the ID number for each SJ-H* unit, it will be easy to control each static elimination bar through the SJ-H01 Remote Control Console.

See "Settings for SJ-H* Series Used with Remote Control Console" (page 7).

Connecting SJ-H* Series units in coupled operation

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

It is possible to connect seven SJ-H* units in coupled operation, provided that the total length between the power supply and the farthest static elimination bar is within 30 m.

* Seven units can be connected only when a 36 V power supply is used. Contact KEYENCE when a 24 V power supply is used.

⚠ Caution

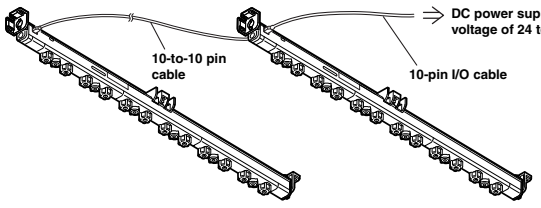
Do not connect a number of power supplies to a single SJ-H* unit or more than one SJ-H* unit connected together, otherwise the power supplies will be short-circuited an accident or malfunction may result.

NOTE

- A coupled installation of the SJ-H* units is possible under the following restrictive conditions.
  - Up to seven SJ-H* units can be connected.
    (Seven units can be connected only when a 36 V power supply is used. Contact KEYENCE when a 24 V power supply is used.)
  - The total extension length between the power supply and the farthest static elimination bar is within 30 m.
- When providing air to more than one SJ-H* unit, check that each static elimination bar is provided with air. If the air supply source is one, each static elimination bar may not be provided with enough air.

■ Connecting in series

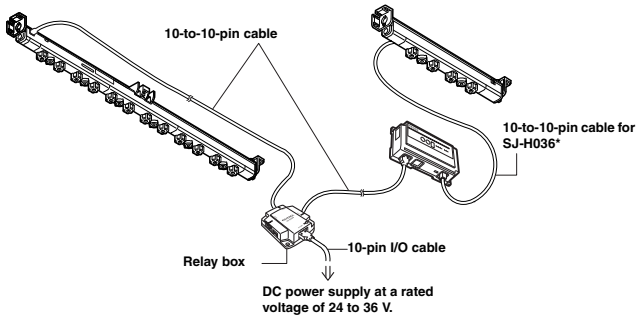
Up to seven SJ-H/SJ-HV/SJ-HC units can be connected in series over the optional 10-to-10-pin serial cable.



* The SJ-HA Series cannot be connected in series.

■ Connecting in parallel

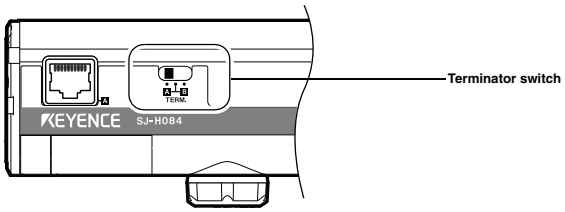
Up to seven SJ-H* units can be connected in parallel over the optional 10-to-10-pin serial cable through the optional OP-84296 relay box.



■ Terminator switch setting

If the SJ-H/SJ-HV/SJ-HC Series is installed in serial, set the terminator switch to meet the connection state.

* The SJ-HA Series does not have the terminator switch.



- **If the modular plug is connected to port A:**
  Set the terminator switch to "A."
- **If the modular plug is connected to port B:**
  Set the terminator switch to "B."
- **If the modular plug is connected to both ports A and B:**
  Set the terminator switch to the center.

NOTE

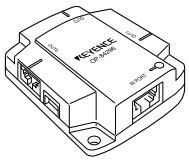
- Only move the terminator switch when the power to the SJ-H/SJ-HV/SJ-HC is OFF.
- If the terminal switch is not set correctly, alarm outputs on the SJ-H/SJ-HV/SJ-HC Series will not be output correctly.

OP-84296 relay box

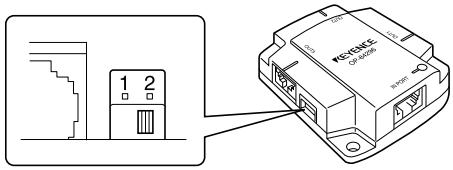
SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

Using the OP-84296 relay box allows the SJ-H* Series to be connected in parallel.*
Use the relay box when the connection between SJ-H* Series is greater than 10 m.

* If no relay box is used, the SJ-H* Series can only be connected in serial.



- Set the terminator switch to "2" if the SJ-H* Series is connected to the OUT port of the relay box.
- Set the terminator switch of the OUT port that is not connected to the SJ-H* Series to "1".



⚠ Caution

Do not connect a number of power supplies to a single SJ-H* unit or more than one SJ-H* unit connected together, otherwise the power supplies will be short-circuited an accident or malfunction may result.

NOTE

- A coupled installation of the SJ-H* units is possible under the following restrictive conditions.
  - Up to seven SJ-H* units can be connected.
    (Seven units can be connected only when a 36 V power supply is used. Contact KEYENCE when a 24 V power supply is used.)
  - The total extension length between the power supply and the farthest static elimination bar is within 30 m.
- When providing air to more than one SJ-H* unit, check that each static elimination bar is provided with air. If the air supply source is one, each static elimination bar may not be provided with enough air.
- If the terminal switch is not set correctly when using a relay box, alarm outputs on SJ-H* units in the series will not be output correctly.

Settings when Remote Control Console is Used

This section explains setting items when the optional Remote Control Console is used.
* The SJ-HA Series does not have the remote control function.

Frequency setting

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

It is necessary to set the FREQ switch of the SJ-H/SJ-HV/SJ-HC Series to 9 before using the SJ-H01 Remote Control Console (SJ-H01) to control the SJ-H/SJ-HV/SJ-HC Series.
For details, see the Instruction Manual of the SJ-H01 Remote Control Console.

ID number setting

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

If the SJ-H01 Remote Control Console is used to control more than one SJ-H/SJ-HV/SJ-HC units, it is convenient to set a unique ID number for each unit individually.
The ID number can be set in hexadecimal between 0 and F (i.e., 16 in total). Turn the ID Switch with the provided flat-blade screwdriver to set the ID number.

SJ-H* Series ID number switch	0-9	A	B	C	D	E	F
Remote control ID number key and ID number seal	0-9	10	11	12	13	14	15

Dual I.C.C. (Ion Current Control) setting

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

By using the SJ-H01 Remote Control Console the Dual I.C.C. (Ion Current Control) function can be turned OFF. When the Dual I.C.C. function is turned OFF, it will be possible to use the ion balance adjustment function to generate positive and negative ions at a fixed ratio.
For details, see the Instruction Manual of the SJ-H01 Remote Control Console.

Ion balance adjustment function

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

It is possible to fine-tune the zero point of ion balance by using the SJ-H01 Remote Control Console. This adjustment cannot be made by the static elimination bar by itself.
The zero point of the ion balance is adjusted before shipping. The zero point may shift according to the environment of installation. The ion balance adjustment made by the SJ-H01 makes it possible to maintain proper static elimination.
For details, see the Instruction Manual of the SJ-H01 Remote Control Console.

L.P.C. function

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

The L.P.C. (Long-cycle Pulse Control) function can be turned on when using the SJ-H01 Remote Control Console.
See "Other Functions" (page 5) for more information on the L.P.C. function.

Clearing an alarm state

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

Alarm states can be cleared when using the SJ-H01 Remote Control Console.
For details, see the Instruction Manual of the SJ-H01 Remote Control Console.

Alarm output control function

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

Any type of warning (Ion level warning, Condition warning or alarm) can be raised at any time when using the SJ-H01 Remote Control Console.
For details, see the Instruction Manual of the SJ-H01 Remote Control Console.

Quick ion check function

SJ-H Series SJ-HA Series SJ-HV Series SJ-HC Series

The quantity of generated ions can be checked faster than usual using the SJ-H01 Remote Control Console.
For details, see the Instruction Manual of the SJ-H01 Remote Control Console.

Maintenance of Electrode Probes

When the SJ-H* Series is used for a long period, the electrode probes become dirty due to the accumulation of dust.
If you continue to use the SJ-H* Series with dust accumulating on the electrode probes, the static elimination ability may deteriorate, resulting in an accident or product breakdown. Therefore, be sure to clean the electrode probes periodically.

Maintenance of electrode probes

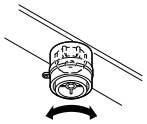
Use an OP-84299 electrode probe cleaning kit for the SJ-H* Series or a cotton swab when performing maintenance on the electrical probes.

⚠Warning

- Turn off the SJ-H* Series before the maintenance of the electrode probes.
- Do not touch the electrode probes directly with your hand or fingers, as this may cause injury. Be extremely careful when cleaning them.

■ Cleaning the electrode probes : OP-84299 Electrode probe cleaning kit for the SJ-H* Series

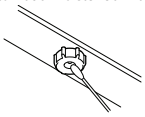
Soak the filter of the cleaning kit with alcohol, and place the cleaning kit on the electrode probe and rotate it gently two or three times.
The filter on the cleaning kit will remove any dirt from the electrode probes. Replacement filters (OP-42218) are also available.



* For the information on how to remove the filter, refer to the Instruction Manual of the Electrode Probe Cleaning Kit for the SJ-H Series.

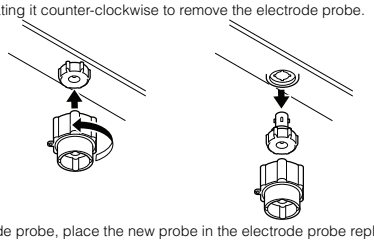
■ Clean the electrode probe : Cotton bud

Clean the electrode probe with a cotton bud moistened with alcohol.

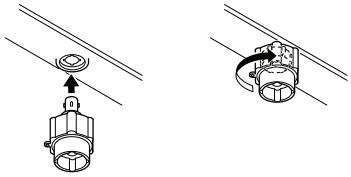


■ Changing the electrode probes

Place an OP-84363 electrode probe replacement kit over the electrode probe and press it towards the device while rotating it counter-clockwise to remove the electrode probe.

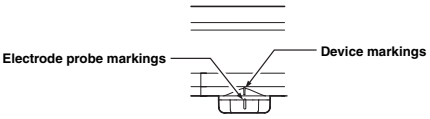


To attach an electrode probe, place the new probe in the electrode probe replacement kit, line it up with the grooves and insert it. Press the kit towards the device and turn clockwise to secure the electrode probe.

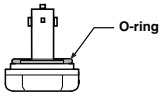


NOTE

- When attaching an electrode probe, line up the markings on the device and the markings on the electrode probe.

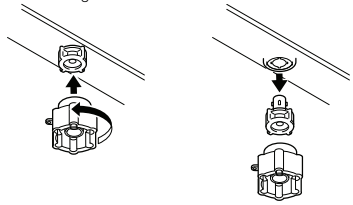


- When attaching an electrode probe, check that the O-ring is at the designated position.

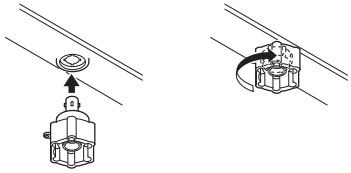


■ Changing the accelerating electrode probes

Place an OP-84363 electrode probe replacement kit over the accelerating electrode probe and press it towards the device while rotating it counter-clockwise to remove the accelerating electrode probe.

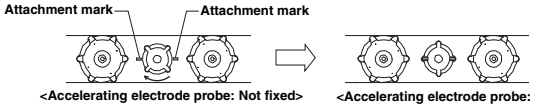


To attach an accelerating electrode probe, place the new electrode probe in the replacement kit, line it up with the grooves and insert it. Press the kit towards the device and turn clockwise to secure the electrode probe.



NOTE

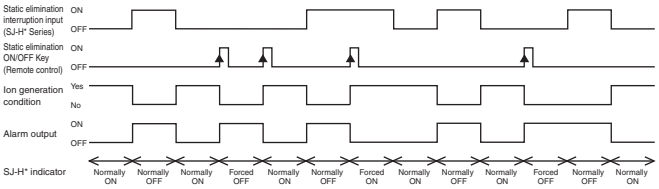
When attaching the accelerating electrode probe, be sure to align the attachment marks on the SJ-H* Series and the protrusions of the accelerating electrode probe.
The accelerating electrode probe can not be attached to the SJ-HA/SJ-HV/SJ-HC Series.



Timing Charts

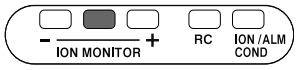
This section explains the timing charts of the SJ-H* Series.

■ Control of Ion generation

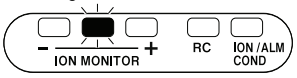


● Static elimination ON/OFF Indicator

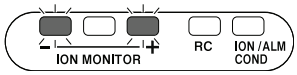
Normal operation
Static charge or ion quantity



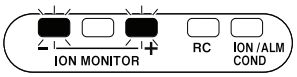
Normal static elimination OFF
Flashing red



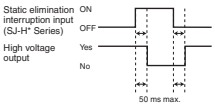
Forced static elimination ON
Flashing green



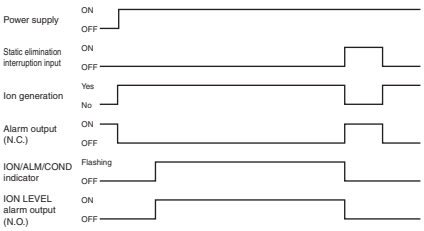
Forced static elimination OFF
Flashing red



■ Input response

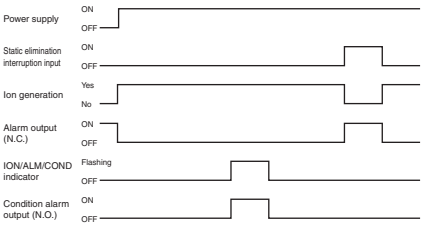


■ Ion level alarm output timing chart



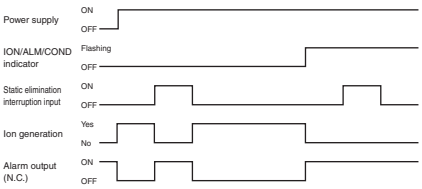
After the ION LEVEL alarm is once displayed, the SJ-H* Series will not return to the previous state unless any of the following items is performed.
1. Static elimination is interrupted.
2. Setting changes are made.
3. The SJ-H* Series is turned off and on.

■ Condition alarm output timing chart



When the cause of the condition alarm output is remedied after the condition alarm is displayed once, the SJ-H* Series will return to normal mode.

■ Alarm output timing chart



After an alarm is once displayed, the SJ-H* Series will not return to the previous state unless any of the following items is performed.
1. The SJ-H* Series is turned off and on.
2. The alarm is cleared through remote control.

Troubleshooting

Refer to the following list for troubleshooting and remedies before sending out the unit for repairs.

Problem	Inspection	Remedy
No ION MONITOR indicators are working.	Check that the power supply cable is connected correctly.	Connect the power supply cable correctly.
	Check that the power supply is within the rated range.	Use power supply within the rated range.
No static elimination is performed.	Check that the electrode probes are not worn out or dirty.	Carry out maintenance work on the electrode probes or replace them.
	Check that static elimination is not interrupted.	Cancel the static elimination interruption input of the SJ-H* Series and the static elimination interruption setting in the Remote Control Console.
	Check if the abnormal discharge detection function is working. (Check if the alarm is output)	Eliminate conductive objects within 20 mm of the electrode probe and turn on the SJ-H* Series again.
	Check that the ground is connected.	Confirm that the ground is properly connected.
Static elimination is not performed properly.	Check that the correct frequency setting is selected.	Select the optimal frequency setting according to the operating distance.
	Check that there is no conductive object or another Static Eliminator Unit close to the SJ-H* Series.	Keep the SJ-H* Series away from the conductive object or the Static Eliminator Unit.
	Check that the ground is connected.	Confirm that the ground is properly connected.
Ion level (ION LEVEL) alarm is illuminated and output frequently.	Check that the electrode probes are not worn out or dirty.	Carry out maintenance work on the electrode probes or replace them.
The condition (COND) alarm is illuminated and output frequently.	Check that there is no conductive object or another Static Eliminator Unit close to the SJ-H* Series.	Keep the SJ-H* Series away from the conductive object or the Static Eliminator Unit.
The alarm (ALM) indicator is illuminated.	Check that there is no conductive object within 10 mm of the SJ-H* Series.	Eliminate the conductive object within 10 mm of the SJ-H* Series and turn the SJ-H* Series OFF and ON. The abnormal discharge detection function may have been turned ON.
	Check that the SJ-C*H is connected.	The modular jack may not be inserted properly or the cable may be disconnected. Connect the modular jack correctly and turn the SJ-H* Series OFF and ON.
Control output is not output correctly.	Check that the cable is wired correctly.	Check the output circuit and make sure that the wiring is correct.
	Check if no sensitivity setting is made.	Make a sensitivity setting so that the alarms will be output.
	Check that the terminator switch is set properly.	Confirm the connection method and make the correct settings.
Static elimination interrupt input is not input properly.	Check that the cable is wired correctly.	Check the input circuit and make sure that the wiring is correct.
Cannot understand the meaning of the indicators	-	See "Indicator specifications" (page 9).
It is not accepting remote controller operation	-	Refer to the SJ-H Remote Control Console SJ-H01 Instruction Manual.
A distance extension of 10 m or more is required.	-	Purchase the Extension Cable and Relay Connector.

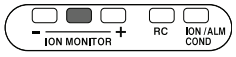
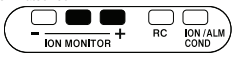
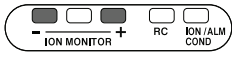
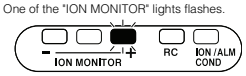
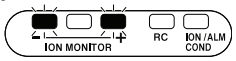
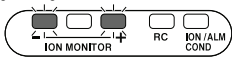
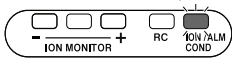
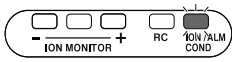
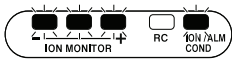
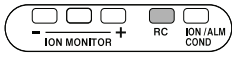
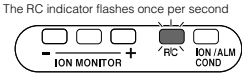
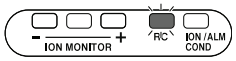
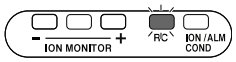
Warnings and Remedies

This section explains each type of warning, as well as the most common causes and best remedies for each issue.

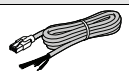
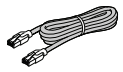
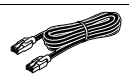
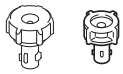
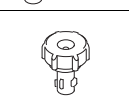
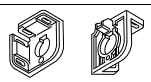
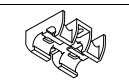
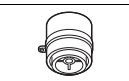
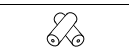
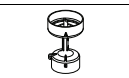
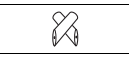
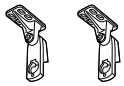
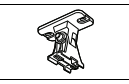
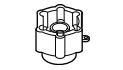
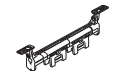
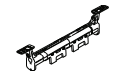
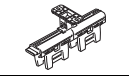
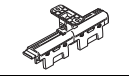
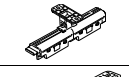
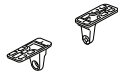
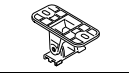
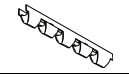
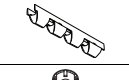
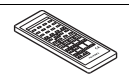
Warning	Major causes	Remedy
Alarm	Irregular discharge from the end of a probe	Turn the power off and remove any conductive objects from the area around the static elimination bar.
	Ground not connected	Confirm that the ground is properly connected.
	Internal circuit damage	Contact your nearest sales office.
Ion level warning	Dirt on the electrode probes	Turn the power OFF and clean the electrode probe. If the ion level warning persists after cleaning, confirm the surroundings of the electrode probe.
	Electrode probe wear	Turn the power OFF and replace the electrode probe
	Ground not connected	Confirm that the ground is properly connected.
Condition warning	Influence from a grounding conductor near the static elimination device	The warning may flash when a grounding conductor such as a metal object is close enough to interfere with the static elimination device. Remove any grounding conductors near the static elimination device. See "Interference" (page 3).
	Ground not connected	Confirm that the ground is properly connected.

Indicator Specifications

■ **Indicator specifications during setting change, checking, and while in operation**

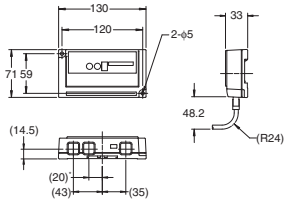
Indicator	Lighting specifications	Description
ION MONITOR	One of the "ION MONITOR" lights is illuminated 	**Charge level display** Displays the target's static charge. When the leftmost (or rightmost) indicator is illuminated, it means that the target's negative (or positive) static charge is very high. The indicator illuminated changes according to the quantity of the target's static charge. See "Indicators" (page 5).
	The rightmost two ION MONITOR indicators are illuminated red. 	**Continuous positive ion generation** Positive ions are generated continuously
	The leftmost two ION MONITOR indicators are illuminated red. 	**Continuous negative ion generation** Negative ions are generated continuously
	A single ION MONITOR indicator on the positive side is illuminated along with a single ION MONITOR on the negative side. 	**Ion quantity indicator** Displays the quantity of ions generated by the SJ-H/SJ-HV/SJ-HC Series. See "Indicators" (page 5).
	One of the "ION MONITOR" lights flashes. 	**Frequency setting** When the frequency is set, the indicator corresponding to the set frequency will flashes for approximately five seconds. See "Frequency Settings" (page 4).
	The ION MONITOR indicator in the middle flashes red. 	**Normal static elimination interruption** The indicator will flash red when static elimination is interrupted by short-circuiting the blue and pink wires of the 10-pin I/O cable.
	The ION MONITOR indicators on the left and right flash red. 	**Forced static elimination interruption** The indicator will flash red when static elimination is interrupted by the remote control, regardless of the static elimination setting of the 10-pin I/O cable.
	The ION MONITOR indicators on the left and right flash green. 	**Forced static elimination** The indicator will flash green when static elimination is started by the remote control, regardless of the static elimination setting of the 10-pin I/O cable.
ION/ALM/COND	The ION/ALM/COND flashes once per second 	**Condition warning** The indicator flashes if the ion balance is bad due to the influence of the installation environment. **Flashes Green** :Sensitivity low **Flashes Yellow** :Sensitivity medium **Flashes Red** :Sensitivity high **OFF** :No sensitivity setting When the alarm level is changed to another level, the corresponding color will flash slowly for approximately five seconds. When the condition warning and the ion level warning occur at the same time, the "ION/ALM/COND" indicator flashes first for the ion level warning.
	The ION/ALM/COND indicator flashes twice per second. 	**Ion level warning** The indicator flashes when the quantity of ion generation drops below the set value. **Flashes Green** :Sensitivity low **Flashes Yellow** :Sensitivity medium **Flashes Red** :Sensitivity high **OFF** :No sensitivity setting When the alarm level is changed to another level, the corresponding color will flash slowly for approximately five seconds. When the condition warning and the ion level warning occur at the same time, the "ION/ALM/COND" indicator flashes first for the ion level warning.
ION/ALM/COND, ION MONITOR	The ION/ALM/COND indicator and the all ION MONITOR indicator flash red. 	**Alarm** When an abnormal electric discharge occurs or the internal circuit is damaged, the ION/ALM/COND indicator will flash three times per second and the ION MONITOR indicators will flash red slowly.
RC	The RC indicator illuminates or flashes 	**Remote control** The indicator is illuminated for flashes when the SJ-H* Series is under remote control. **Illuminates Yellow** : Remote control is locked. **Flashes Yellow** :The ID number of the static elimination bar from the remote control is selected or the remote control lock is unlocked **Quickly Flashes Yellow** :The ID number is selected during lock or the remote control lock is set. **OFF** : Remote control is not locked.
	The RC indicator flashes once per second 	**Dual I.C.C. setting/confirmation** The indicator flashes after Dual I.C.C. setting or confirmation. **Flashes Green** : Dual I.C.C. ON **Flashes Red** : Dual I.C.C. OFF
	The RC indicator flashes twice per second 	**Ion balance adjustment confirmation** The indicator flashes after confirmation of whether the ion balance is being adjusted. **Flashes Green** : Ion balance adjustment OFF **Flashes Red** : Ion balance adjustment ON
	The RC indicator flashes three times per second 	**L.P.C. setting/confirmation** The indicator flashes after L.P.C. setting or confirmation. **Flashes Green** : L.P.C. OFF **Flashes Red** : L.P.C. ON

List of Optional Accessories

Item	Type	Appearance	Description
10-pin I/O cable	SJ-C2U SJ-C5U SJ-C10U		Power cable for the SJ-H* Series. Three types (2-, 5-, 10-m cables) are available. (Cable color: Gray)
10 pin-10 pin cable	OP-42210 OP-42211 OP-42212		Cable for connecting the SJ-H* Series units. Three types (2-, 5-, 10-m cables) are available. This cable connects to the Relay Box as well. (Cable color: Gray)
10-to-10-pin cable for SJ-H036	SJ-C2H SJ-C5H SJ-C10H		The cable that connects the SJ-H036 controller to the bar. Three types (2-, 5-, 10-m cables) are available. (Cable color: Black)
Tungsten electrode probes (four) for SJ-H Tungsten accelerating electrode probes (two) for SJ-H	OP-84292		Tungsten-made electrode probes and accelarating electrode probes (Made for SJ-H)
Tungsten electrode probes (four) for SJ-HA	OP-84293		Tungsten-made electrode probes (Made for SJ-HA)
Tungsten electrode probes (four) for SJ-HV	OP-84294		Tungsten-made electrode probes (Made for SJ-HV)
Silicon electrode probes (four) for SJ-HC	OP-84295		Silicon-made electrode probes (Made for SJ-HC)
Relay Box for SJ-H* Series	OP-84296		Used for connecting SJ-H* units together.
End unit for SJ-H* Series	OP-84301		Used for installing the SJ-H* Series.
Auxiliary support for SJ-H* Series	OP-84300		Used to for installing SJ-H* Series.
Electrode probe cleaning kit for SJ-H* Series	OP-84299		Used for maintaining the electrode probes on the SJ-H* Series. * This cannot be used when the laminar flow assisting part is a attached.
Replacement filters for the electrode cleaning kit (10 pieces)	OP-42218		Cotton filters for the cleaning kit.
Electrode probe cleaning kit 2 for the SJ-H* Series	OP-84454		Used to perform maintenance on the inside wall of the electrode probe cap.
Replacement filter for the electrode probe cleaning kit 2 (10 pieces)	OP-84455		Replacement filters for the cleaning kit 2.
SJ-GL/G/V/R exchange side supports	OP-84297		Used to match the installation dimensions of the SJ-GL/G/V/R Series. Also used for rotation.
SJ-GL/G/V/R exchange central supports	OP-84298		Used to match the installation dimensions of the SJ-GL/G/V/R Series. Also used for rotation.
Electrode probe replacement kit for SJ-H* Series	OP-84363		Used for changing the electrode probes on the SJ-H* Series.
Straight air booster starter unit	SJ-HS01		Used to increase the static elimination speed.
Wide angle booster starter unit	SJ-HW01		Used to widen the static elimination range.
Extension unit for straight air booster	SJ-HS02		Used to extend the auxiliary air straight unit.
Extension unit for wide angle booster	SJ-HW02		Used to extend the auxiliary air diffusion unit.
Sealing extension unit for air booster	SJ-HM01		Used over areas where auxiliary air should not be used.
End unit for air booster	OP-84386		Used to mount the SJ-H* Series wearing an air booster.
Auxiliary support for air booster	OP-84385		Used to mount the SJ-H* Series wearing an air booster.
Laminar flow assisting part starter unit	OP-84380		Supports the laminar downflow.
Extension unit for laminar flow assisting part	OP-84381		Used to extend the laminar flow assisting part.
Electrode probe replacement kit for laminar flow assisting part	OP-84382		Used to replace the electrode probes when the laminar flow assisting part is attached.
Remote Control Console for SJ-H* Series	SJ-H01		Remote Control Console to operate the SJ-H* Series

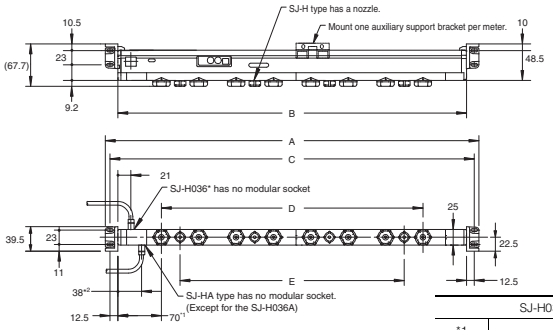
Dimensions

■ Controller unit (SJ-H036* only)



* SJ-H036A has no modular socket.

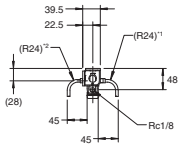
■ Main body



SJ-H036*	
*1	90mm
*2	21mm

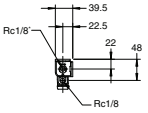
Type	Electrode probes	A	B	C	D	E
SJ-H036*	4	380	340	365	P60×3=180	P120×1=120
SJ-H060*	8	600	560	585	P60×7=420	P120×3=360
SJ-H084*	12	840	800	825	P60×11=660	P120×5=600
SJ-H108*	16	1080	1040	1065	P60×15=900	P120×7=840
SJ-H132*	20	1320	1280	1305	P60×19=1140	P120×9=1080
SJ-H156*	24	1560	1520	1545	P60×23=1380	P120×11=1320
SJ-H180*	28	1800	1760	1785	P60×27=1620	P120×13=1560
SJ-H204*	32	2040	2000	2025	P60×31=1860	P120×15=1800
SJ-H228*	36	2280	2240	2265	P60×35=2100	P120×17=2040
SJ-H252*	40	2520	2480	2505	P60×39=2340	P120×19=2280
SJ-H300*	48	3000	2960	2985	P60×47=2820	P120×23=2760

Common for the left side of the bar



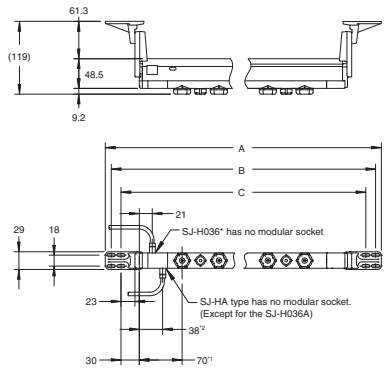
1 SJ-H036 only has the left socket.
*2 SJ-HA type only has the right socket.
(Except for the SJ-H036A)

Common for the right side of the bar (SJ-H228* and longer models)



* Not provided for the SJ-H204* or shorter models.

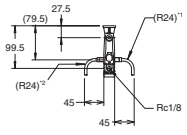
When a rotating mounting bracket is attached



SJ-H036*	
*1	90mm
*2	21mm

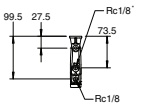
Type	A	B	C
SJ-H036*	451	432	400
SJ-H060*	671	652	620
SJ-H084*	911	892	860
SJ-H108*	1151	1132	1100
SJ-H132*	1391	1372	1340
SJ-H156*	1631	1612	1580
SJ-H180*	1871	1852	1820
SJ-H204*	2111	2092	2060
SJ-H228*	2351	2332	2300
SJ-H252*	2591	2572	2540
SJ-H300*	3071	3052	3020

Common for the left side of the bar



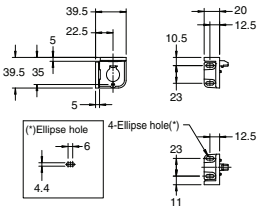
1 SJ-H036 only has the left socket.
*2 SJ-HA type only has the right socket.
(Except for the SJ-H036A)

Common for the right side of the bar (SJ-H228* and longer models)

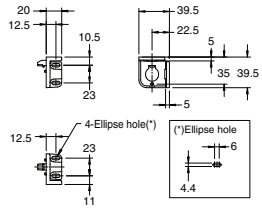


* Not provided for the SJ-H204* or shorter models.

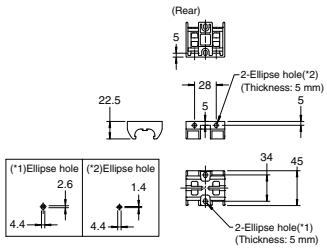
■ End unit L



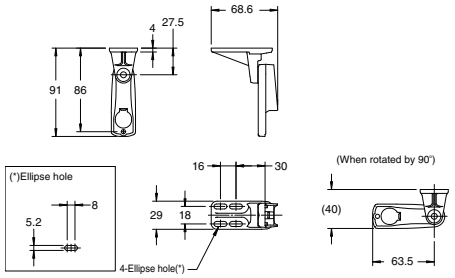
■End unit R



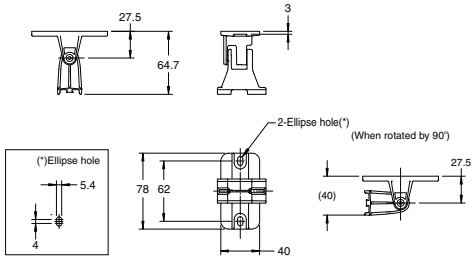
■ Auxiliary support



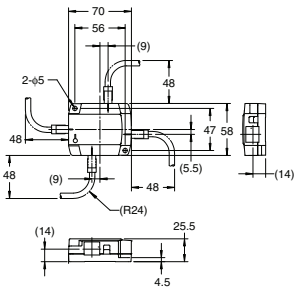
■ Support part for converting to SJ-GL/G/V/R (side)



■ Support part for converting to SJ-GL/G/V/R (intermediate)



■ Relay box (OP-84296)



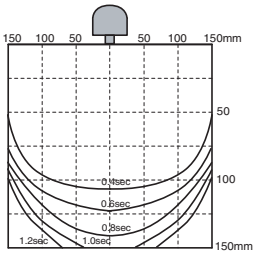
Static Elimination Function List

■ Operating area and operation time

This section shows typical examples of the time necessary for static elimination, and the relationship of the installation distance between the target and the static elimination bar.

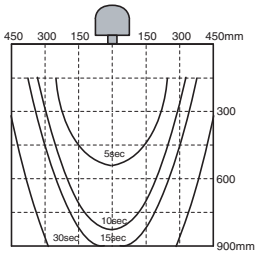
●SJ-H Series

Operating area and time (33 Hz)



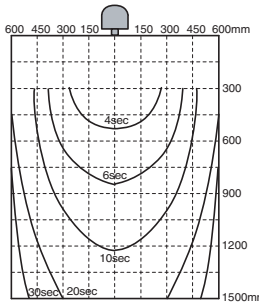
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ± 100 V is measured.
The 150×150mm plate monitor (20 pF) is used.
SJ-H108 is used.
No downflow

Operating area and time (10 Hz)



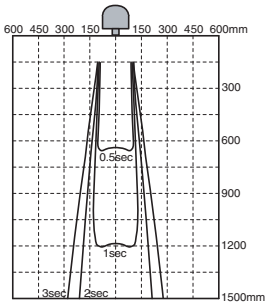
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150×150 mm plate monitor (20 pF) is used.
SJ-H108 is used.
Under the downward air flow of 0.3 m/sec.

Operating area and time (1 Hz)



Measurement conditions:
The time required to eliminate the static charge of the target ±1000 V to ±100 V is measured.
The 150×150 mm plate monitor (20 pF) is used.
SJ-H108 is used.
Under the downward air flow of 0.3 m/sec.

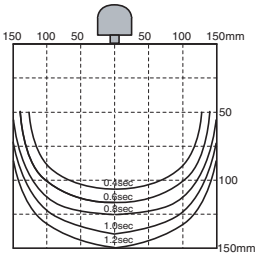
Operating area and time (at air MAX)



Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ± 100 V is measured.
The 150×150mm plate monitor (20 pF) is used.
SJ-H108 is used.
No downflow

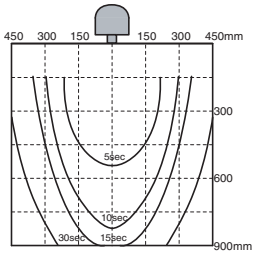
●SJ-HA Series

Operating area and time (33 Hz)



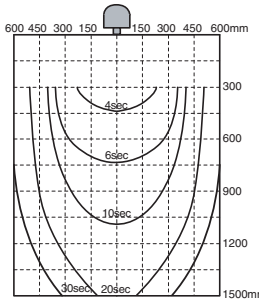
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150×150mm plate monitor (20 pF) is used.
SJ-H108A is used.
No downflow

Operating area and time (10 Hz)



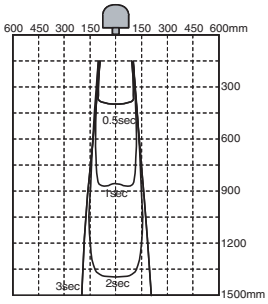
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150×150 mm plate monitor (20 pF) is used.
SJ-H108A is used.
Under the downward air flow of 0.3 m/sec.

Operating area and time (1 Hz)



Measurement conditions:
The time required to eliminate the static charge of the target ±1000 V to ±100 V is measured.
The 150×150 mm plate monitor (20 pF) is used.
SJ-H108A is used.
Under the downward air flow of 0.3 m/sec.

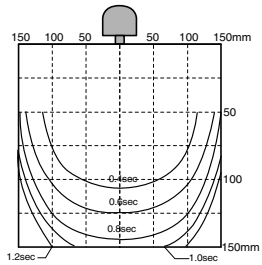
Operating area and time (at air MAX)



Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150×150mm plate monitor (20 pF) is used.
SJ-H108A is used.
No downflow

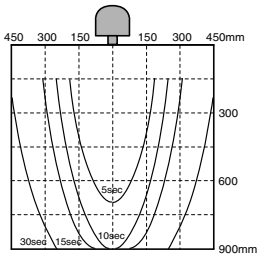
●SJ-HV Series

Operating area and time (33 Hz)



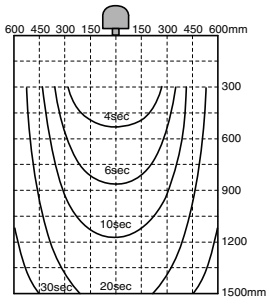
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150×150mm plate monitor (20 pF) is used.
SJ-H108V is used.
Air supply 16 ℓ/min, no downflow

Operating area and time (10 Hz)



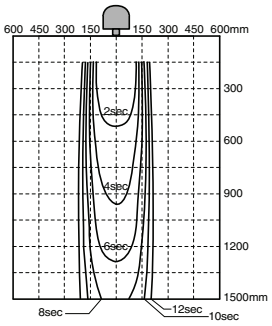
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150×150 mm plate monitor (20 pF) is used.
SJ-H108V is used.
Air supply 16 ℓ/min.
Under the downward air flow of 0.3 m/sec.

Operating area and time (1 Hz)



Measurement conditions:
The time required to eliminate the static charge of the target ±1000 V to ±100 V is measured.
The 150×150 mm plate monitor (20 pF) is used.
SJ-H108V is used.
Air supply 16 ℓ/min.
Under the downward air flow of 0.3 m/sec.

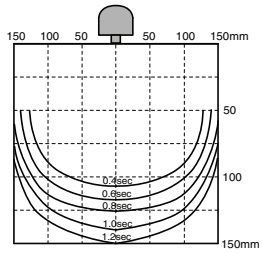
Operating area and time (at air MAX)



Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ± 100 V is measured.
The 150×150mm plate monitor (20 pF) is used.
SJ-H108V is used.
No downflow

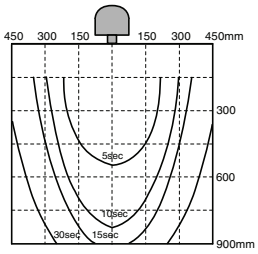
●SJ-HC Series

Operating area and time (33 Hz)



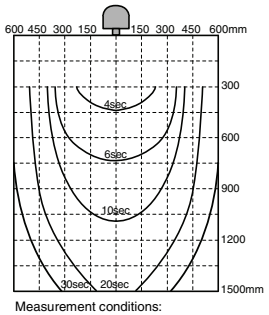
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ± 100 V is measured.
The 150×150mm plate monitor (20 pF) is used.
SJ-H108C is used.
No downflow

Operating area and time (10 Hz)



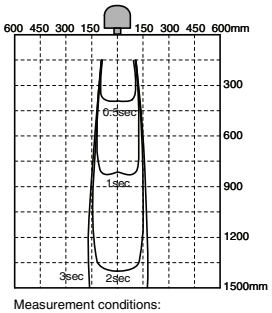
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150×150 mm plate monitor (20 pF) is used.
SJ-H108C is used.
Under the downward air flow of 0.3 m/sec.

Operating area and time (1 Hz)



Measurement conditions:
The time required to eliminate the static charge of the target ±1000 V to ±100 V is measured.
The 150×150 mm plate monitor (20 pF) is used.
SJ-H108C is used.
Under the downward air flow of 0.3 m/sec.

Operating area and time (at air MAX)

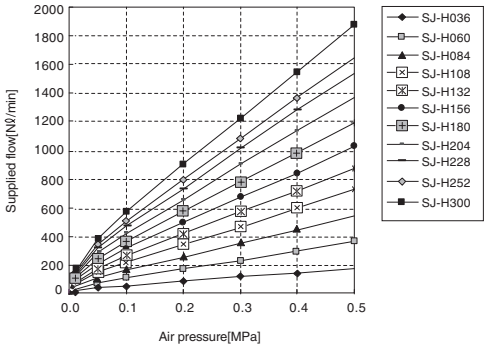


Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ± 100 V is measured.
The 150×150mm plate monitor (20 pF) is used.
SJ-H108C is used.
No downflow

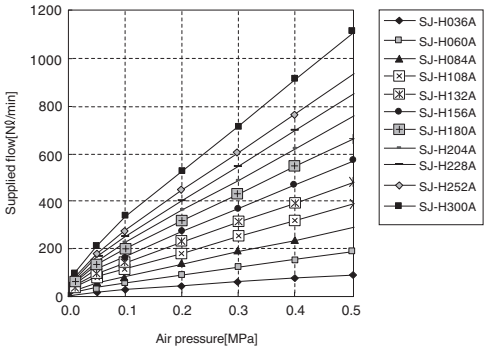
■ Relationship between air pressure and air flow with different bar lengths

The relationship between air pressure and air flow varies depending on the length of the static elimination bar.
Refer to the typical example on the right to select the appropriate air supply device (compressor) that will supply sufficient air flow.

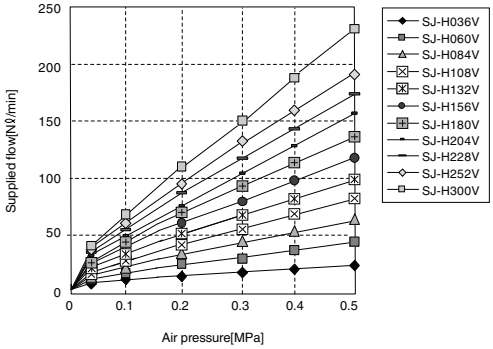
●SJ-H Series



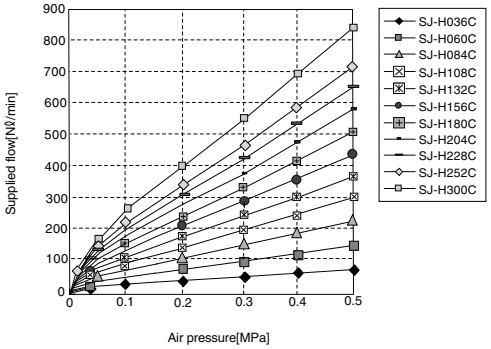
●SJ-HA Series



●SJ-HV Series



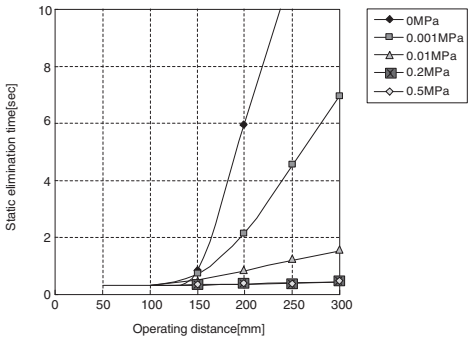
●SJ-HC Series



■ Relationship between operating time and operating distance with different air pressure

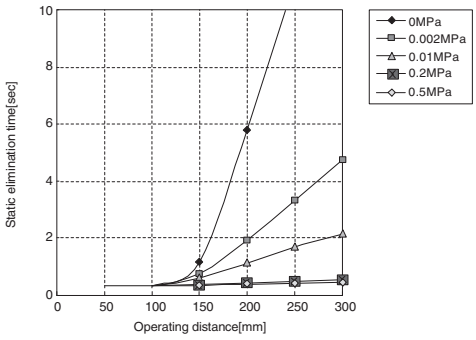
The relationship between operating time and operating distance varies depending on the air pressure.
Refer to the typical example on the right to select the appropriate air pressure.

●SJ-H Series



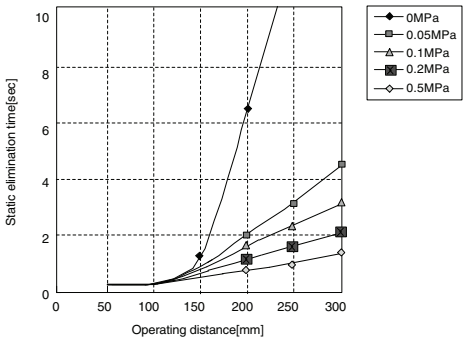
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150 x 150 mm plate monitor (20 pF) is used.
SJ-H108 is used.
No downflow

●SJ-HA Series



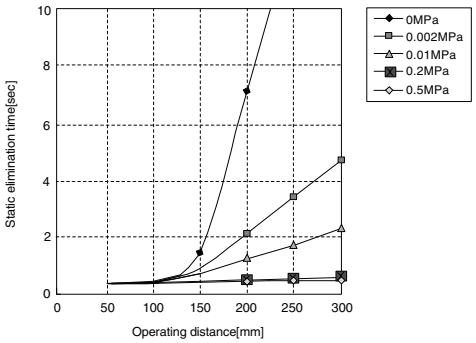
Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150 x 150 mm plate monitor (20 pF) is used.
SJ-H108A is used.
No downflow

●SJ-HV Series



Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150 x 150 mm plate monitor (20 pF) is used.
SJ-H108V is used.
No downflow

●SJ-HC Series

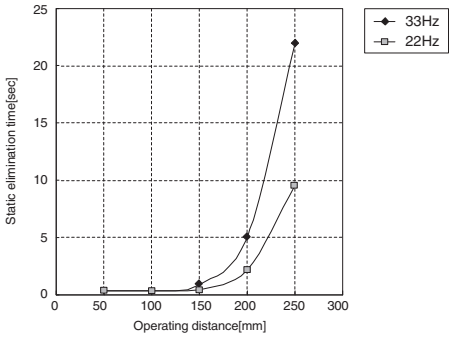


Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured.
The 150 x 150 mm plate monitor (20 pF) is used.
SJ-H108C is used.
No downflow

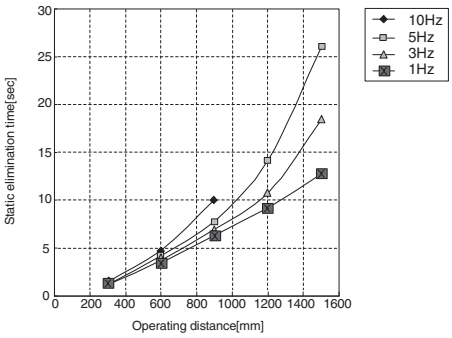
■ Relationships between installation speed and static elimination speed due to frequency settings.

This displays the relationship between frequency settings and static elimination speed and installation distance

●SJ-H Series

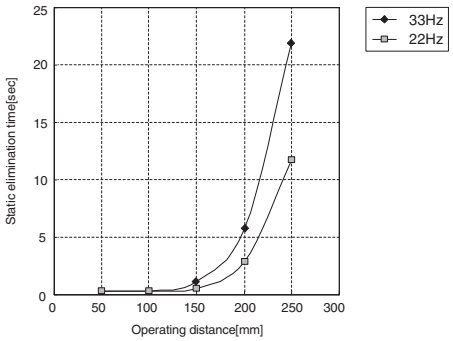


Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ± 100 V is measured.
The 150 x 150mm plate monitor (20 pF) is used.
SJ-H108 is used.
No downflow.

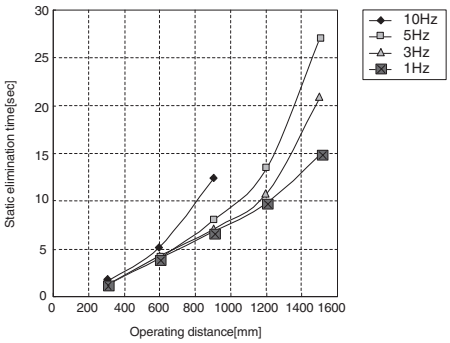


Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ± 100 V is measured.
The 150 x 150mm plate monitor (20 pF) is used.
SJ-H108 is used.
Under the downward air flow of 0.3 m/sec.

●SJ-HA Series

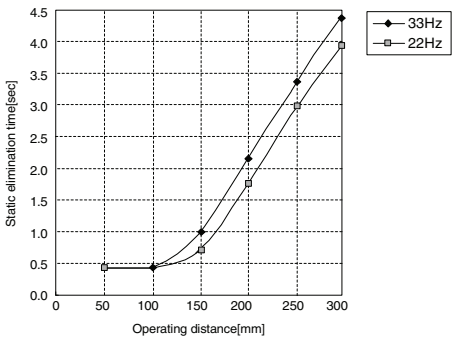


Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured. The 150 x 150mm plate monitor (20 pF) is used.
SJ-H108A is used.
No downflow

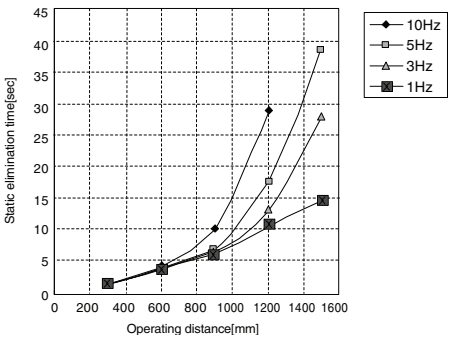


Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured. The 150 x 150mm plate monitor (20 pF) is used.
SJ-H108A is used.
Under the downward air flow of 0.3 m/sec.

●SJ-HV Series

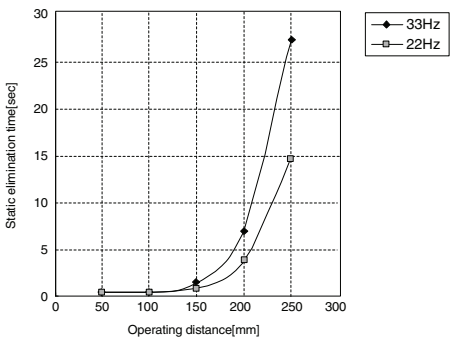


Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured. The 150 x 150mm plate monitor (20 pF) is used.
SJ-H108V is used.
Air supply 16 ℓ/min, no downflow

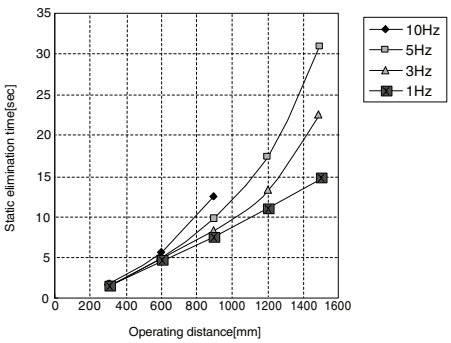


Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ± 100 V is measured.
The 150 x 150mm plate monitor (20 pF) is used.
SJ-H108V is used.
Air Supply 16 ℓ/min.
Under the downward air flow of 0.3 m/sec.

●SJ-HC Series



Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured. The 150 x 150mm plate monitor (20 pF) is used.
SJ-H108C is used.
No downflow



Measurement conditions:
The time required to eliminate the static charge of the target from ±1000 V to ±100 V is measured. The 150 x 150mm plate monitor (20 pF) is used.
SJ-H108C is used.
Under the downward air flow of 0.3 m/sec.

Specifications

Item		Specifications			
Series name		SJ-H Series	SJ-HA Series	SJ-HV Series	SJ-HC Series
Ion generating method		Corona discharge			
Structure		Shock-less resistance coupled			
Voltage application method/Applied voltage		Pulse AC method /± 7000 V			
Ion balance control method		Dual I.C.C.			
Ion balance *1 *2		± 30 V			
Operating distance		50 to 2000 mm			
Control input		NPN open collector or non-voltage relay signal			
Control output		NPN photo relay with 100 mA max. (at 40 V max.)			
Rating	Power supply	24-36 VDC ± 10 %			
	Current consumption	500 mA (at 24VDC), 350 mA or less (at 36 VDC)			
	Overvoltage category	I			
	Pollution degree	2			
Major functions		Condition (COND) warning, ion level (ION LEVEL) warning, alarm (ALM) output			
Air purge connection port		Rc 1/8			
Air purge supply pressure		0.5 MPa max.*3			
Material	Electrode probe	Tungsten			Silicon
	Main body	ABS, PC			
Environment	Ambient temperature	0 to +40 °C			
	Relative humidity	35 to 85 % RH, No condensation			

*1 The value is measured under the following condition.

Operating distance	300 mm (22 Hz)	600 mm (10 Hz)	1500 mm (1 Hz)
Ambient temperature	0 to +40 °C		
Relative humidity	35 to 65 % RH		

* Under the downward air flow of 0.3 m/sec. (1 ℓ of air per electrode probe is supplied to the SJ-HV Series)

*2 Please contact the nearest KEYENCE office for the ion balance of the SJ-HC Series.

*3 Please contact the nearest KEYENCE office when using the air-purge function with intermittent air supply

■ Effective length, total length, weight

Item		Specifications										
Model		SJ-H036*	SJ-H060*	SJ-H084*	SJ-H108*	SJ-H132*	SJ-H156*	SJ-H180*	SJ-H204*	SJ-H228*	SJ-H252*	SJ-H300*
Effective length *4	(unit:mm)	360	600	840	1080	1320	1560	1800	2040	2280	2520	3000
Total length *5	(unit:mm)	380	600	840	1080	1320	1560	1800	2040	2280	2520	3000
Weight *6	(unit:g)	Static elimination bar :510 (500) Controller :150	800 (780)	1000 (980)	1250 (1200)	1450 (1400)	1600 (1550)	1850 (1750)	2100 (2000)	2400 (2350)	2800 (2700)	3250 (3150)

*4 The effective length represents the operating area at an operating distance of 50 mm.

*5 The total length represents the length of the model with a end unit attached.

*6 ( ) :SJ-HA/SJ-HV/SJ-HC Series value.

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Specifications are subject to change without notice.

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