

Ionizer Series *IZS31*



How to Order

Ionizer **IZS31** - **780** [] [] [] - [] [] - []

Bar type []

Bar length

Symbol	Bar length
300	300 mm
380	380 mm
620	620 mm
780	780 mm
1100	1100 mm
1260	1260 mm
1500	1500 mm
1900	1900 mm
2300	2300 mm

Electrode needle material

Nil	Tungsten
C	Silicon
S	Stainless steel

Output

Nil	NPN output
P	PNP output

Power supply cable

Nil	With power supply cable (3 m)
Z	With power supply cable (10 m)
N	None

Made to Order
Refer to the below table.

Sensor

Nil	Without sensor
F	With feedback sensor
G	With autobalance sensor

Bracket (End bracket, Center bracket)

Nil	Without bracket
B	With bracket (Note)

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

Number of brackets

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

Made to Order (Refer to page 23 for details.)

Ionizer / Series IZS31

Symbol	Contents	Specifications
X10	Non-standard bar length compliant (80 mm-pitch)	460, 540, 700, 860, 940, 1020, 1180, 1340, 1420, 1580, 1660, 1740, 1820, 1980, 2060, 2140, 2220
X14	Model with electrode cartridge security cover	The main unit is shipped fitted with an electrode cartridge security cover available as an option.
X15	Model with 40 mm-pitch electrode cartridges	This model comes fitted with electrode cartridges arranged at a 40 mm-pitch (standard pitch: 80 mm). Note) Maximum bar length is 1260 mm. The air purge nozzles are arranged at an 80 mm-pitch.

Power supply cable

How to Order	Contents / Specifications										
<p>IZS31 - CP [] - X13</p> <p>Power supply cable full length</p> <table border="1"> <thead> <tr> <th>Symbol</th> <th>Cable full length</th> </tr> </thead> <tbody> <tr><td>01</td><td>1 m</td></tr> <tr><td>02</td><td>2 m</td></tr> <tr><td>19</td><td>19 m</td></tr> <tr><td>20</td><td>20 m</td></tr> </tbody> </table>	Symbol	Cable full length	01	1 m	02	2 m	19	19 m	20	20 m	<p>Model with made-to-order power supply cable Available in 1 m increments from 1 m to 20 m.</p> <p>Note 1) 11 mm or longer power supply cables are not CE Marking-compliant. Note 2) Use standard power supply cables for 3 m and 10 m lengths.</p>
Symbol	Cable full length										
01	1 m										
02	2 m										
19	19 m										
20	20 m										

Special Individual Specifications (Contact an SMC sales representative.)

- Change in the direction of access to power supply cable
The direction of access to the power supply cable is changed to the right-hand side of the main unit.
Note) The power supply cable is connected directly to the main unit. A connector is not used.

Accessories

Feedback sensor / IZS31-DF



Autobalance sensor / IZS31-DG



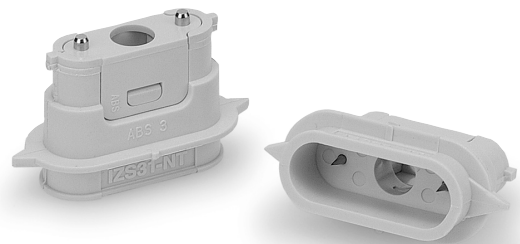
Power supply cable

- IZS31-CP (3 m)
- IZS31-CPZ (10 m)



Electrode cartridge

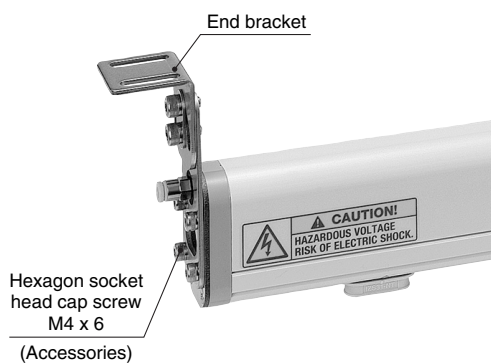
- IZS31-NT (Material: Tungsten)
- IZS31-NC (Material: Silicon)
- IZS31-NS (Material: Stainless steel)



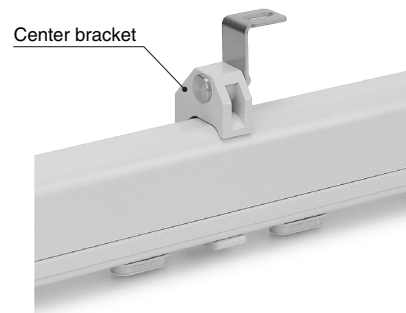
Bracket

Note) The model number is for a single bracket.

End bracket / IZS31-BE



Center bracket / IZS31-BM



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

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

Series IZS31

Option

Electrode cartridge security cover

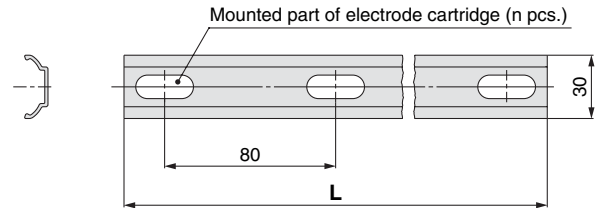
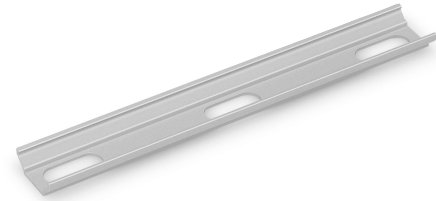
IZS31-E 3

Number of fixed electrode cartridges

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

Number of required security covers

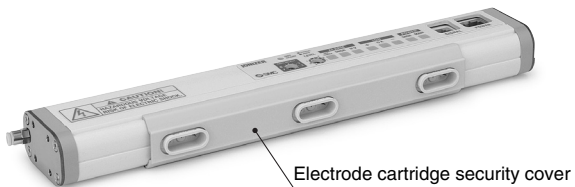
Bar length (mm)	Number of required security covers		
	IZS31-E3	IZS31-E4	IZS31-E5
300	1	—	—
380	—	1	—
620	1	1	—
780	—	1	1
1100	3	1	—
1260	1	3	—
1500	—	2	2
1900	1	5	—
2300	—	2	4



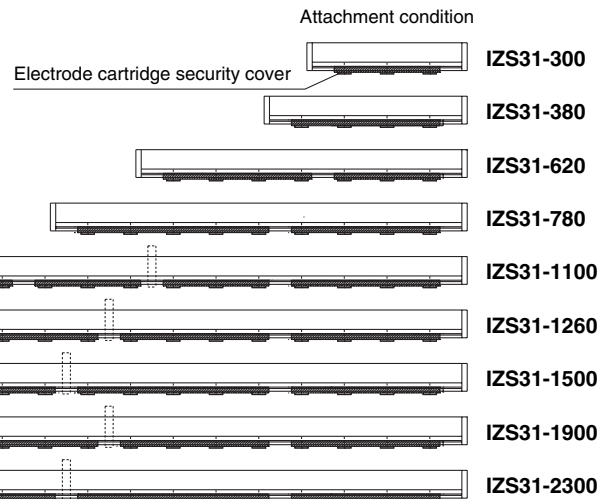
Part no	L
IZS31-E3	200
IZS31-E4	280
IZS31-E5	360

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

IZS31 **Standard part no.** -X14



When attached to the main unit



Driver for ion balance adjustment trimmer / IZS30-M1

Electrode needle cleaning kit / IZS30-M2



Specifications

Ionizer model		IZS31-□□ (NPN specification)	IZS31-□□P (PNP specification)
Ion generation method		Corona discharge type	
Method of applying voltage		Sensing DC, Pulse DC, DC	
Output for emitting electricity		7000 V	
Ion balance <small>Note 1)</small>		30 V (Stainless electrode needle: 100 V)	
Air purge	Fluid	Air (Clean and dry)	
	Operating pressure	0.7 MPa or less	
	Connecting tubing O.D.	ø4	
Power supply voltage		24 VDC 10%	
Current consumption	Sensing DC mode	200 mA or less (While standing by: 120 mA or less)	
	Pulse DC mode	200 mA or less (When sensor is not used: 170 mA or less)	
	DC mode	170 mA or less	
Input signal	Emission of static electricity is suspended. Maintenance	Contact input signal with no voltage	
Output signal	Static electricity removal is completed.	Max. load current: 100 mA Residual voltage: 1 V or less (At load current 100 mA) Max. applied voltage: 28 VDC	Max. load current: 100 mA Residual voltage: 1 V or less (At load current 100 mA)
	Maintenance output		
	Irregularity		
	Sensor monitor output <small>Note 2)</small>	Voltage output 1 to 5 V (Connect a 10 kΩ or larger load.)	
Effective discharge distance		50 to 2000 mm (Sensing DC mode: 200 to 2000 mm)	
Operating ambient temperature, Operating fluid temperature		0 to 50°C	
Operating ambient humidity		35 to 80%Rh (With no condensation)	
Material		Cover of ionizer: ABS, Electrode needle: Tungsten, Monocrystal silicon, Stainless steel	
Vibration resistance		Durability 50 Hz Amplitude 1 mm XYZ each 2 hours	
Shock resistance		10 G	
Compliance with overseas standards / directive		CE (EMC directive: 89/336/EEC, 92/31/EEC, 93/68/EEC, 2004/108/EC, Low voltage directive: 73/23/EEC, 93/68/EEC)	

Note 1) In case where air purge is performed between a charged object and an ionizer at a distance of 300 mm.

Note 2) In cases where the potential of a charged object is measured using a feedback sensor, the relationship between the potential being measured, the sensor monitor output voltage and the detection range of the sensor vary depending on the sensor's installation distance. Refer to page 3.

Number of Electrode Cartridges and Weight

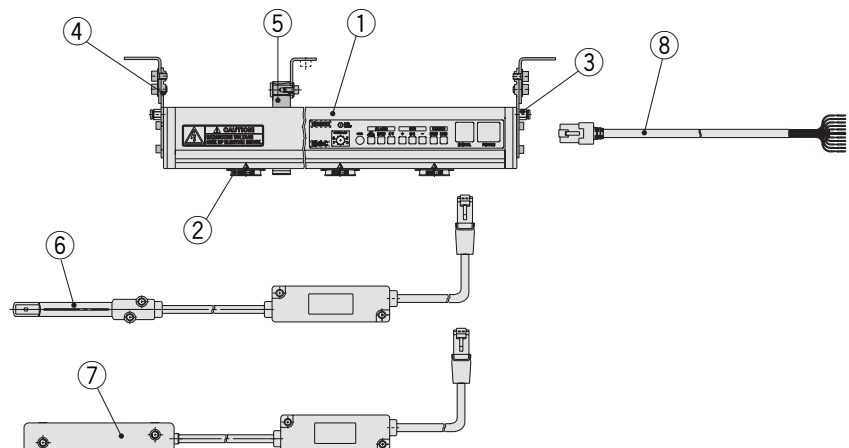
Bar length (mm)	300	380	620	780	1100	1260	1500	1900	2300
Number of electrode cartridges	3	4	7	9	13	15	18	23	28
Weight (g)	470	530	720	850	1100	1220	1410	1730	2040

Sensor

Sensor model	IZS31-DF (Feedback sensor)	IZS31-DG (Autobalance sensor)
Operating ambient temperature	0 to 50°C	
Operating ambient humidity	35 to 80%Rh (With no condensation)	
Case material	ABS	ABS, Stainless steel
Vibration resistance	Durability 50 Hz Amplitude 1 mm XYZ each 2 hours	
Shock resistance	10 G	
Weight	200 g (Including cable weight)	220 g (Including cable weight)
Installation distance	10 to 50 mm (Recommended)	—
Compliance with overseas standards / directive	CE (EMC directive: 89/336/EEC, 92/31/EEC, 93/68/EEC, 2004/108/EC, Low voltage directive: 73/23/EEC, 93/68/EEC)	

Construction

No.	Description
1	Ionizer
2	Electrode cartridge
3	One-touch fitting
4	End bracket
5	Center bracket
6	Feedback sensor
7	Autobalance sensor
8	Power supply cable



Functions

1. Operation mode

There are 3 different operation modes (Sensing DC mode / Pulse DC mode / DC mode) for the IZS31, which can be selected based on the application and operating condition.

(1) Sensing DC mode

The discharge time is reduced by detecting the workpiece's charge condition with a feedback sensor which feeds the data back to the ionizer and causes ions with the polarity best suited for static electricity removal being emitted. The static electricity removal completion signal turns off when the workpiece's electrostatic potential falls within 30 V. ^{Note)}

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

Either "Energy Saving Run" or "Continuous Static Electricity Removal Run" can be selected as the operation method depending on the ionizer's operation mode after the completion of static electricity removal.

Energy saving run	The ionizer stops discharging upon completion of static electricity removal. It resumes discharging when the workpiece's electrostatic potential exceeds 30 V. ^{Note)} For the removal of static electricity from conductive workpieces, "Energy Saving Run" is recommended.
Continuous static electricity removal run	Even after the completion of static electricity removal, this method continues to remove static electricity using DC pulses while controlling the ion balance, so that the workpiece's electrostatic potential falls within 30 V. For the removal of static electricity from nonconductive workpieces, "Continuous Static Electricity Removal Run" is recommended.

Note) When the feedback sensor is installed at a height of 25 mm.

(2) Pulse DC mode

Alternatively emits positive and negative ions.

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

If the ion balance exceeds 30 V due to electrode needle contamination, the ionizer outputs a maintenance output signal.

This mode is suited for removing spatial static electricity or preventing workpieces from becoming electrostatically charged.

■ When an autobalance sensor is used.

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

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

■ When an autobalance sensor is not used.

Use a balance adjustment trimmer to adjust the ion balance. This requires the separate use of a measuring instrument to verify the ion balance.

(3) DC mode

Continuously emits positive and negative ions. Parts other than the object need to be appropriately grounded to prevent from being charged. This mode cannot emit both positive and negative ions at the same time.

Functions

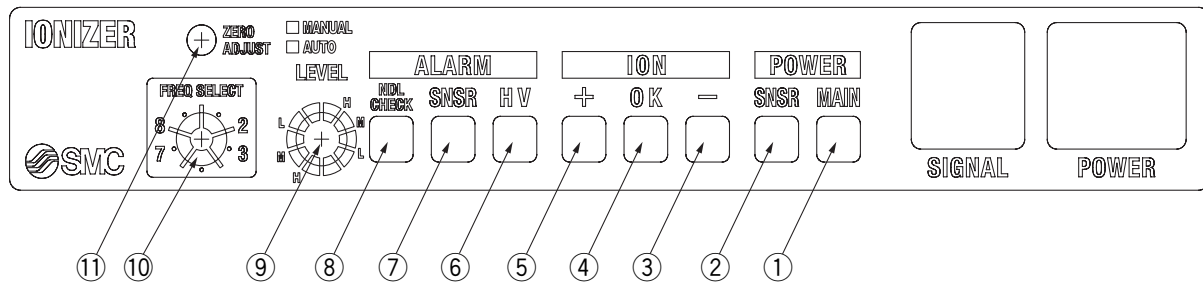
2. Stain-detection on an electrode needle

When a maintenance start signal is input the ionizer detects any deterioration that may interfere with the electrode needles' capability to remove static electricity. If the needles need to be cleaned due to such deterioration, a maintenance display LED comes on and the ionizer outputs a maintenance output signal.

Note) Deterioration in static electricity removal capability cannot be detected by only connecting a feedback sensor or autobalance sensor.

Verify the capability by periodically inputting a maintenance start signal.

3. Display/Setting component description



No.	Description	Type	Contents
1	Power supply display	LED (Green)	Illuminates when power is supplied. Blinks when the supply voltage is abnormal.
2	Sensor display	LED (Green)	Illuminates when the feedback sensor or autobalance sensor is connected.
3	Negative display	LED (Blue)	Functionality differs depending on the operation mode. Refer to Section 4, "Determining the Model and Settings" on page 10.
4	Static electricity removal completion display	LED (Green)	
5	Positive display	LED (Orange)	
6	Irregular high voltage display	LED (Red)	Illuminates when an irregular current on an electrode needle.
7	Irregular sensor display	LED (Red)	Illuminates when the feedback sensor or autobalance sensor is not in normal operation.
8	Maintenance display	LED (Red)	Illuminates when electrode needle contamination is detected. Blinks while the contamination is being detected.
9	Maintenance level selection switch	Rotary switch	Functionality differs depending on the operation mode. Refer to Section 4, "Determining the Model and Settings" on page 10.
10	Frequency selection switch	Rotary switch	
11	Ion balance adjustment trimmer	Trimmer	Used to adjust the ion balance when the autobalance sensor is not used.

Determining the Model and Settings 1 / Sensing DC Mode

1. Sensing DC mode (Refer to page 14 when using the ionizer in the pulse DC mode, or refer to page 18 when using it in the DC mode.)

1) Selection of bar length

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

2) Installation of the ionizer

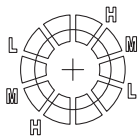
- Install within 200 to 2000 mm. Although the main unit can also be used at other distances, it may fail to operate normally depending on the conditions of use. Before use, always verify that the main unit is functioning normally.

3) Installation of the sensor

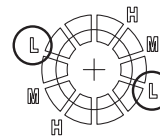
- Install the feedback sensor with the detection hole facing the charged surface.
- Installation at a height from 10 to 50 mm is recommended. Although the sensor can also be used at other heights, it may fail to operate normally depending on the conditions of use. Before use, always verify that the sensor operates normally. (Refer to “Installation height of feedback sensor and discharge time/ion balance” on page 2 as a guide.)
- When the ionizer and feedback sensor are connected, the sensing DC mode is automatically selected.

4) Configuration of stain-detection level on an electrode needle

- Maintenance level selection switch
- Set the switch to either H (high), M (middle) or L (low). At settings other than these, the ionizer does not perform electrode needle stain-detection.



H (High) Level that does not effect the discharge time.
 M (Middle) Level immediately before the discharge time is extended.
 L (Low) Level at which the discharge time is longer than it was initially.

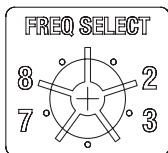


* Settings with the same letter share the same level.

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

5) Configuration of frequency selection switch

- Use this switch to select “Energy Saving Run” or “Continuous Static Electricity Removal Run”.
- This switch is used to select ion generation frequency for “Continuous Static Electricity Removal Run,” after the completion of static electricity removal.



		How to run	Switch setting
Energy saving run	Automatically stops emitting electricity even after completing the static electricity removal.		
Continuous static electricity removal run	Continuously eliminates static electricity with pulse DC by controlling the ion balance so that the charged potential on a workpiece would be within 30 V even after completing the static electricity removal. The ionizer generates ions at the preset frequency.	<p>(Example) Charged object workpiece: negative electric charge</p> <p>Static electricity removal completed</p>	<p>0...1 Hz 1...3 Hz 2...5 Hz 3...10 Hz 4...15 Hz 5...20 Hz 6...30 Hz 7...60 Hz</p>

Determining the Model and Settings 1 / Sensing DC Mode

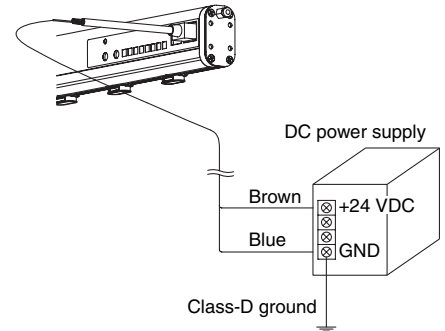
6) Wiring of power supply cable

- Connect the dedicated power supply cable.

■ Connection with ionizer driving power supply

Symbol	Cable color	Description	Connection needs	Contents
DC1 (+)	Brown	Power supply 24 VDC	○	Ionizer driving power supply cable
DC1 (-)	Blue	Power supply GND [FG]	○	
OUT4	Green	Sensor monitor output	△	Outputs the workpiece's electrostatic potential as an analog signal (1 to 5 V).

* DC1 (-) [Blue] is sure to ground it according to class-D. If the terminal is not grounded, the ionizer may malfunction.



■ Wiring of input/output signal power supply cable

Symbol	Cable color	Description	Connection needs	Contents
DC2 (+)	Red	Power supply 24 VDC	○	Input/output signal power supply cable
DC2 (-)	Black	Power supply GND	○	
IN1	Yellow green	Electricity discharge stop signal	○	Signal for enabling/disabling discharging (NPN specification) Discharging is enabled when connected to DC2 (-) [Black]. (PNP specification) Discharging is enabled when connected to DC2 (+) [Red].
IN2	Gray	Maintenance start signal	△	Signal to be input when determining the necessity of electrode needle maintenance
—	White	—	—	—
—	Orange	—	—	—
OUT1	Peach	Electricity removal completion signal	△	Signal to be output when the workpiece's electrostatic potential is outside 30 V or when electrode needle contamination is being detected.
OUT2	Yellow	Maintenance output signal	△	Signal to be output when electrode needle maintenance is necessary.
OUT3	Purple	Irregular signal	△	Outputs when signal is irregular high voltage, irregular sensor, irregular CPU (B type contact output)

○: Minimum wiring requirement for ionizer operation

△: Wiring necessary to use various functions

—: Wiring not required in the sensing DC mode. Exercise caution to ensure that this wire does not short-circuit to other wires.

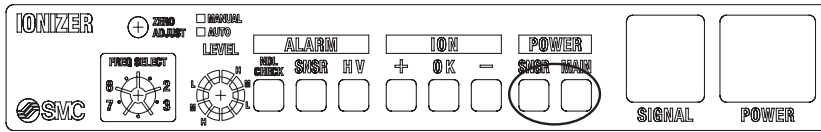
7) Air piping

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

Determining the Model and Settings 1 / Sensing DC Mode

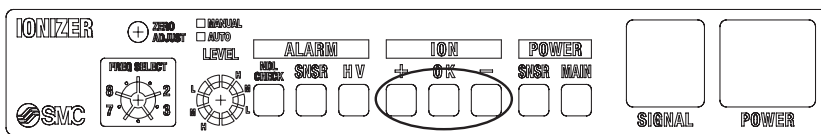
8) LED display

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



LED name		Function
POWER	MAIN	Illuminates when power is supplied (Green). (Blinks when the power supply is irregular.)
	SNSR	Illuminates when the feedback sensor is connected (Green).

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

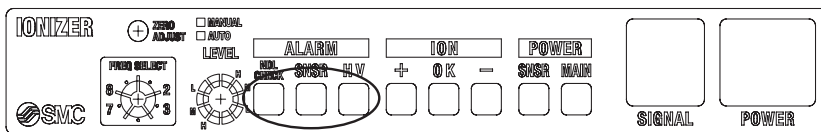


LED name		Function
ION	+	Illuminates when the workpiece is positively charged (Orange).
	OK	Illuminates when the workpiece electrostatic potential is low (Green).
	-	Illuminates when the workpiece is negatively charged (Blue).

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

Workpiece electric polarity	LED + OK -	Workpiece electric charge voltage	■ Light ON ■ Blinking at 4 Hz □ Light OFF
Positive	■ □ □	+400 V or higher	
	■ □ □	+100 V to +400 V	
	■ ■ □	+30 V to +100 V	
Negative	□ ■ □	Within 30 V	
	□ ■ ■	-30 V to -100 V	
	□ □ ■	-100 V to -400 V	
	□ □ ■	-400 V or lower	

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



LED name		Function
ALARM	HV	Illuminates when an abnormal current flows through an electrode needle (Red).
	SNSR	Illuminates when the feedback sensor is not operating normally (Red).
	NDL CHECK	Illuminates when electrode needle contamination is detected (Red). (Blinks while the contamination is being detected.)

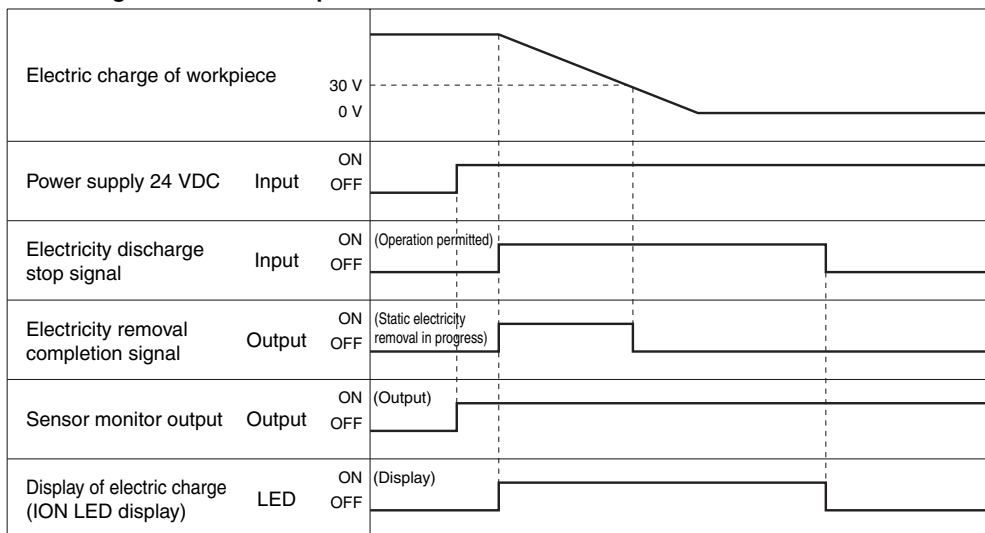
Determining the Model and Settings 1 / Sensing DC Mode

9) Alarm

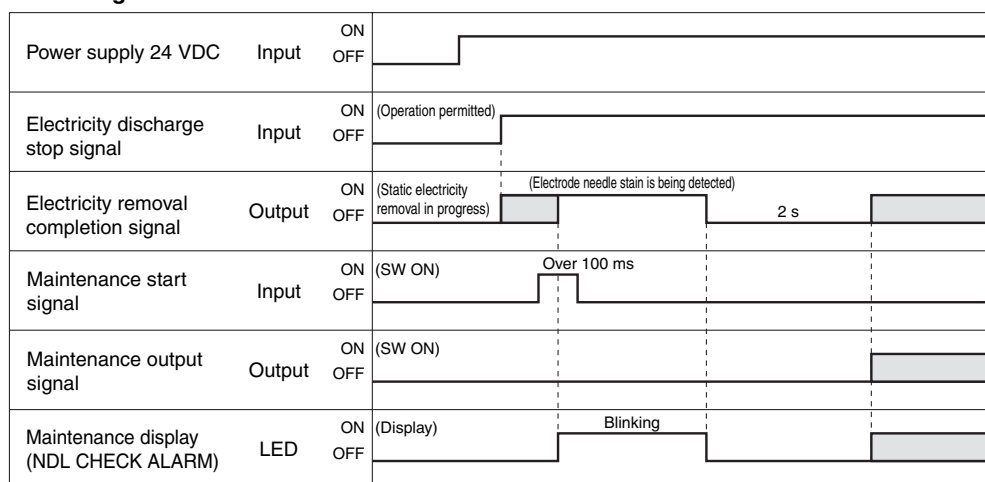
Alarm item	Description	Corrective actions
High voltage irregularity	Gives notification of the occurrence of an abnormal current, such as high-voltage leakage. The ionizer stops discharging, turns on the HV ALARM display, and outputs a fault signal.	Turn off the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal off, then on.
Sensor irregularity	Gives notification that the feedback sensor has become unable to operate normally. The ionizer turns on the SNSR ALARM display and outputs a fault signal.	Turn off the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal off, then on.
CPU irregularity	Gives notification of the occurrence of a failure in the CPU due to noise, etc. All of the LED displays blink and a fault signal is output.	Turn off the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal off, then on.
Electrode needle maintenance	Gives notification that electrode needle maintenance is necessary. The NDL CHECK ALARM display comes on and a maintenance output signal is output.	Turn off the power, clean the electrode needles, and turn the power on again.

10) Timing chart

■ Timing chart in normal operation



■ Timing chart in electrode needle stain is detected.



■ : Either ON or OFF depending on the situation.

· A signal indicating static electricity removal completion is output when the detection of electrode needle stain is in progress.

⚠ Caution

Ions are emitted from the ionizer to detect electrode needle stain and the workpiece may therefore be electrostatically charged. Perform this detection procedure in the absence of workpieces.

Determining the Model and Settings 2 / Pulse DC Mode

2. Pulse DC mode

1) Selection of bar length

- Determine the length suited for a work size, referring to the “Electricity Removal Characteristics” and “Electricity Removal Range”, etc.

2) Installation of the ionizer

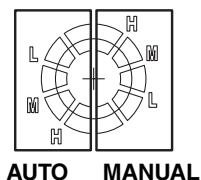
- Install the ionizer within 50 to 2000 mm of the object requiring electricity removal. However, install the main unit at a distance from 100 to 2000 mm when using an autobalance sensor. Although the main unit can also be used at other distances, it may fail to operate normally depending on the conditions of use. Before use, always verify that the main unit is functioning normally.

3) Installation of the sensor

- When adjusting the ion balance using a sensor, install an autobalance sensor.
- Install the sensor immediately below the ionizer so that it is level with the workpiece.
- When an autobalance sensor is connected, the balance adjustment trimmer settings are nullified.

4) Configuration of maintenance level selection switch

- This switch is used to select “Manual Operation” or “Automatic Operation” when an autobalance sensor is connected to adjust the ion balance.

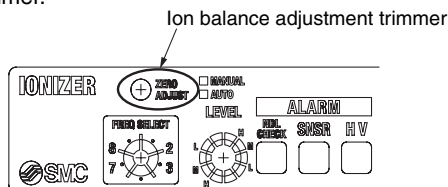


Details of operation		Switch setting
Manual operation	When a maintenance start signal is input or the ionizer is turned on, the ionizer detects electrode needle contamination according to ion balance adjustment and detection level settings. An ion balance adjustment value for each ion generation frequency is retained. When the ion generation frequency is changed, adjust the ion balance. After adjustment, the autobalance sensor may be removed as ion balance adjustment will not be performed again until a maintenance start signal is input.	MANUAL
Automatic operation	The ionizer continuously adjusts the ion balance. When the autobalance sensor is removed, adjust the ion balance manually using the balance adjustment trimmer.	AUTO

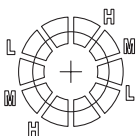
* Set the switch according to the stain-detection level.

When an autobalance sensor is not used.

When an autobalance sensor is not used, set the switch to AUTO. Then, adjust the ion balance manually using the balance adjustment trimmer.



- Configuration of stain-detection level on an electrode needle.
- Set the switch to either H (high), M (middle) or L (low). At settings other than these, the ionizer does not perform electrode needle stain-detection



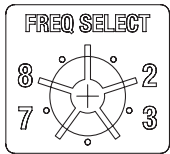
- H (High) Level not influential to the discharge time
- M (Middle) ... Level immediately before the discharge time elongates.
- L (Low) Level at which the discharge time is longer than it initially was.

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

Determining the Model and Settings 2 / Pulse DC Mode

5) Frequency selection switch setting

- Selects ion generation frequency



Ion generation frequency	Switch setting
1 Hz	0
3 Hz	1
5 Hz	2
10 Hz	3
15 Hz	4
20 Hz	5
30 Hz	6
60 Hz	7

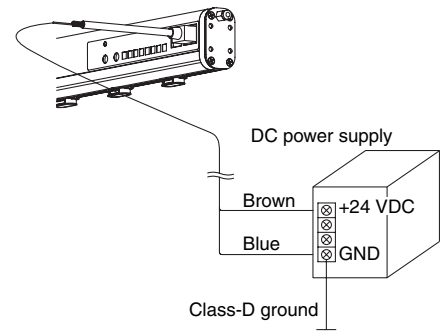
6) Wiring of power supply cable

- Connect the dedicated power supply cable.

■ Connection with ionizer driving power supply

Symbol	Cable color	Description	Connection needs	Contents
DC1 (+)	Brown	Power supply 24 VDC	○	Ionizer driving power supply cable
DC1 (-)	Blue	Power supply GND [FG]	○	
OUT4	Green	Sensor monitor output	—	—

* DC1 (-) [Blue] is sure to ground it according to class-D. If the terminal is not grounded, the ionizer may malfunction.



■ Wiring of input/output signal power supply cable

Symbol	Cable color	Description	Connection needs	Contents
DC2 (+)	Red	Power supply 24 VDC	○	Input/output signal power supply cable
DC2 (-)	Black	Power supply GND	○	
IN1	Yellow green	Electricity discharge stop signal	○	Signal for enabling/disabling discharging (NPN specification) Discharging is enabled when connected to DC2 (-) [Black]. (PNP specification) Discharging is enabled when connected to DC2 (+) [Red].
IN2	Gray	Maintenance start signal	△	Signal to be input when determining the necessity of electrode needle maintenance
—	White	—	—	—
—	Orange	—	—	—
OUT1	Pink	Electricity removal completion signal	△	Signal to be output when the workpiece's electrostatic potential is outside 30 V or when electrode needle contamination is being detected.
OUT2	Yellow	Maintenance output signal	△	Signal to be output when electrode needle maintenance is necessary.
OUT3	Purple	Irregular signal	△	Outputs when signal is irregular high voltage, irregular sensor, irregular CPU (B type contact output)

○: Minimum wiring requirement for ionizer operation

△: Wiring necessary to use various functions

—: Wiring not required in the sensing DC mode. Exercise caution to ensure that this wire does not short-circuit to other wires.

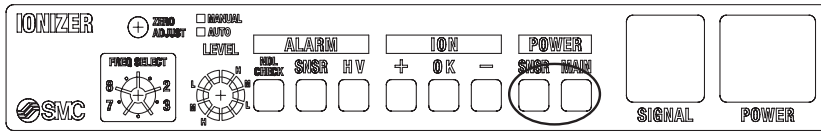
7) Air piping

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

Determining the Model and Settings 2 / Pulse DC Mode

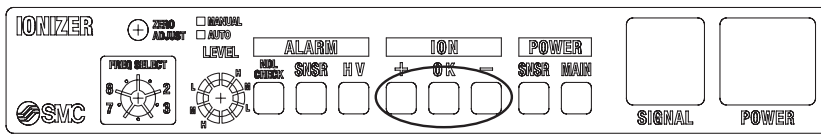
8) LED display

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



LED name		Function
POWER	MAIN	Illuminates when power is supplied (Green). (Blinks when the power supply is irregular.)
	SNSR	Illuminates when the feedback sensor is connected (Green).

- **ION LED**...Indicates the polarity of ions being emitted and the ion balance.



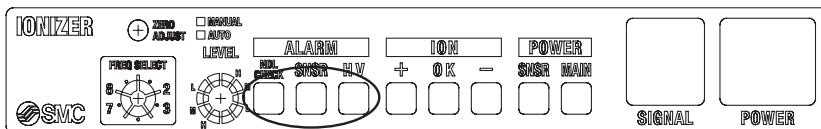
LED name		Function
ION	+	Illuminates that positive ions are being emitted from the ionizer (Orange).
	OK	[With autobalance sensor] Indicates the state of ion balancing (Green). [Without autobalance sensor] Remains turned off.
	-	Illuminates that negative ions are being emitted from the ionizer (Blue).

- The state of ion balancing can be checked by reading the LED display.

Ion balance	OK LED
Under 30 V	Light ON (or Blinking)
Over 30 V	Light OFF

- * The OK LED display blinks when the ion balance is approaching the limits of the adjustable range, signaling that the time for electrode needle maintenance is near.

- **ALARM LED**...Indicates abnormal states of the ionizer.



LED name		Function
ALARM	HV	Illuminates when an abnormal current flows through an electrode needle (Red).
	SNSR	Illuminates when the autobalance sensor is not operating normally (Red).
	NDL CHECK	Illuminates when electrode needle stain is detected (Red). (Blinks when the stain is being detected.)

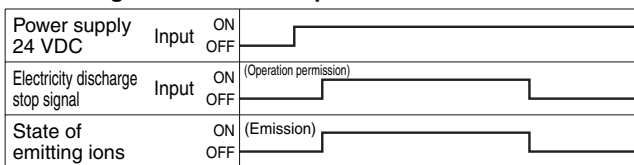
Determining the Model and Settings 2 / Pulse DC Mode

9) Alarm

Alarm item	Description	Corrective actions
High voltage irregularity	Gives notification of the occurrence of an abnormal current, such as high-voltage leakage. The ionizer stops discharging, turns on the HV ALARM display, and outputs a fault signal.	Turn off the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal off, then on.
Sensor irregularity	Gives notification that the feedback sensor has become unable to operate normally. The ionizer turns on the SNSR ALARM display and outputs a fault signal.	Turn off the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal off, then on.
CPU irregularity	Gives notification of the occurrence of a failure in the CPU due to noise, etc. All of the LED displays blink and a fault signal is output.	Turn off the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal off, then on.
Electrode needle maintenance	Gives notification that electrode needle maintenance is necessary. The NDL CHECK ALARM display comes on and a maintenance output signal is output.	Turn off the power, clean the electrode needles, and turn the power on again.

10) Timing chart

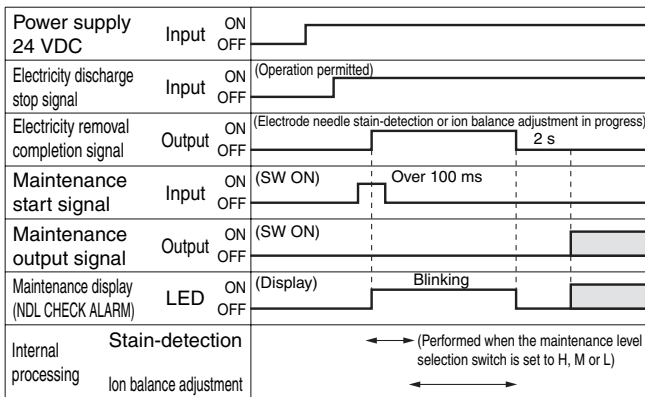
■ Timing chart in normal operation



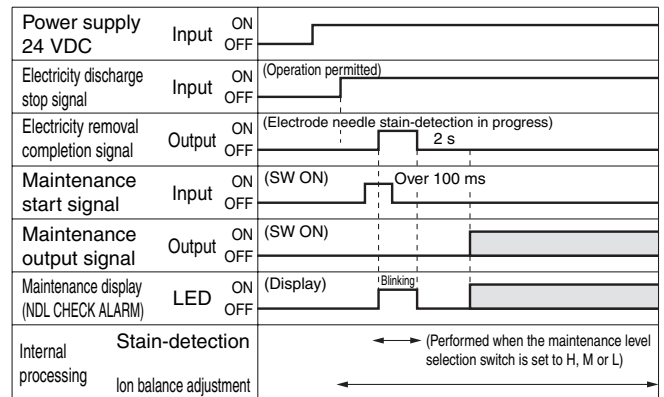
■ Timing chart in electrode needle stain is detected or ion balance is detected.

(a) When an auto-balance sensor is connected.

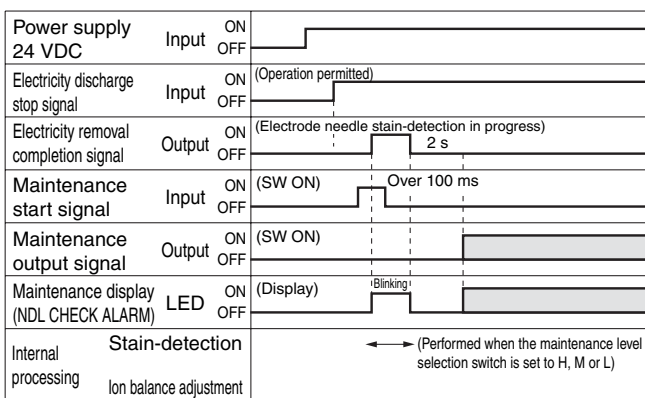
(1) Manual run



(2) Auto run



(b) When an auto-balance sensor is not connected.



■ : Either ON or OFF depending on the situation.

- A signal indicating static electricity removal completion is output when the detection of electrode needle stain is in progress.

⚠ Caution

Ions are emitted from the ionizer to detect electrode needle stain and the workpiece may therefore be electrostatically charged. Perform this detection procedure in the absence of workpieces.

Determining the Model and Settings 3 / DC Mode

3. DC mode

1) Selection of bar length

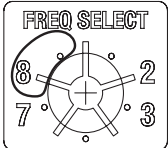
- Determine the length suited for a work size, referring to the “Electricity Removal Characteristics” and “Electricity Removal Range”, etc.

2) Installation of the ionizer

- Install the ionizer within 50 to 2000 mm of the object requiring electricity removal. Although the main unit can also be used at other distances, it may fail to operate normally depending on the conditions of use. Before use, always verify that the main unit is functioning normally.

3) Frequency selection switch setting

- Use this switch to select “Positive Ion Emission” or “Negative Ion Emission”.



Ion polarity	Configuration of switch
Positive ion emission	8
Negative ion emission	9

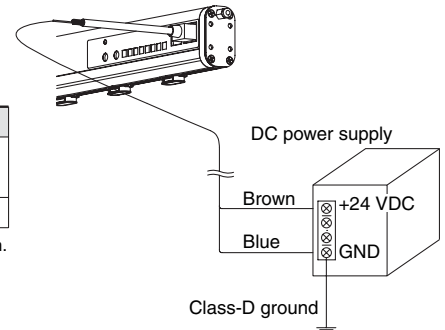
4) Wiring of power supply cable

- Connect the dedicated power supply cable.

■ Connection with ionizer driving power supply

Symbol	Cable color	Description	Connection needs	Contents
DC1 (+)	Brown	Power supply 24 VDC	○	ionizer driving power supply cable
DC1 (-)	Blue	Power supply GND [FG]	○	
OUT4	Green	Sensor monitor output	—	

* DC1 (-) [Blue] is sure to ground it according to class-D. If the terminal is not grounded, the ionizer may malfunction.



■ Wiring of input / output signal power supply cable

Symbol	Cable color	Description	Connection needs	Contents
DC2 (+)	Red	Power supply 24 VDC	○	Input/output signal power supply cable
DC2 (-)	Black	Power supply GND	○	
IN1	Yellow green	Electricity discharge stop signal	○	Signal for enabling/disabling discharging (NPN specification) Discharging is enabled when connected to DC2 (-) [Black]. (PNP specification) Discharging is enabled when connected to DC2 (+) [Red].
IN2	Gray	Maintenance start signal	△	—
—	White	—	—	—
—	Orange	—	—	—
OUT1	Pink	Electricity removal completion signal	△	—
OUT2	Yellow	Maintenance output signal	△	—
OUT3	Purple	Irregular signal	△	Outputs when signal is irregular high voltage, irregular sensor, irregular CPU (B type contact output)

○: Minimum wiring requirement for ionizer operation

△: Wiring necessary to use various functions

—: Wiring not required in the sensing DC mode. Exercise caution to ensure that this wire does not short-circuit to other wires.

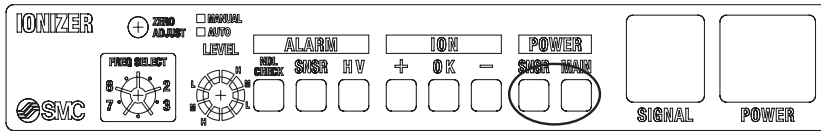
5) Air piping

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

Determining the Model and Settings 3 / DC Mode

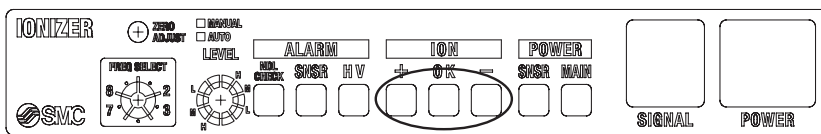
6) LED display

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



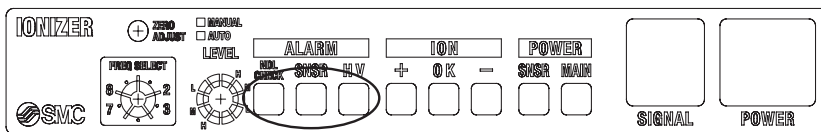
LED name		Function
POWER	MAIN	Illuminates when power is supplied (Green). (Blinks when the power supply is irregular.)
	SNSR	Light OFF

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



LED name		Function
ION	+	Illuminates that positive ions are being emitted from the ionizer (Orange).
	OK	Light OFF
	-	Illuminates that negative ions are being emitted from the ionizer (Blue).

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



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

7) Alarm

Alarm item	Description	Corrective actions
High voltage irregularity	Gives notification of the occurrence of an abnormal current, such as high-voltage leakage. The ionizer stops discharging, turns on the HV ALARM display, and outputs a fault signal.	Turn off the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal off, then on.
CPU irregularity	Gives notification of the occurrence of a failure in the CPU due to noise, etc. All of the LED displays blink and a fault signal is output.	Turn off the power, solve the problem, then turn the power on again. Alternatively, turn the discharge stop signal off, then on.

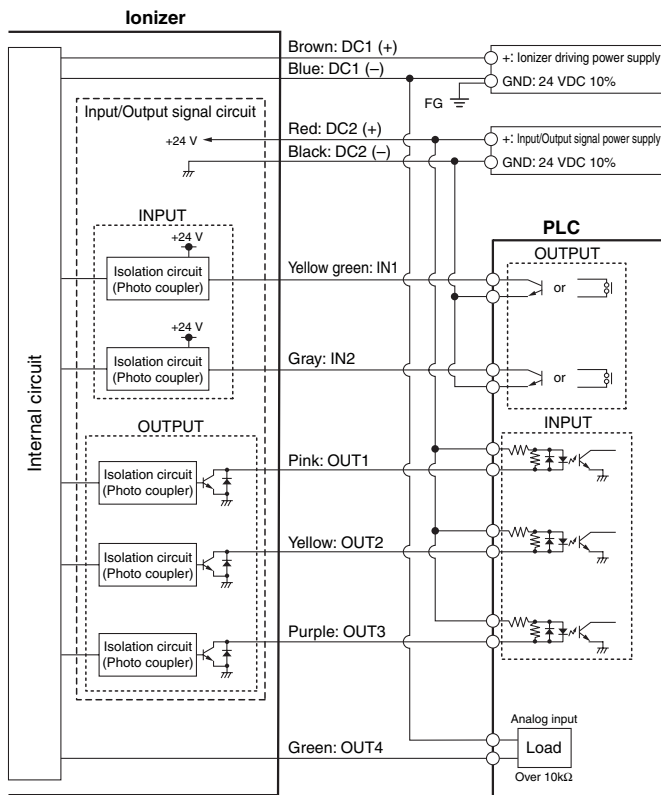
8) Timing chart

■ **Timing chart at normal operation**

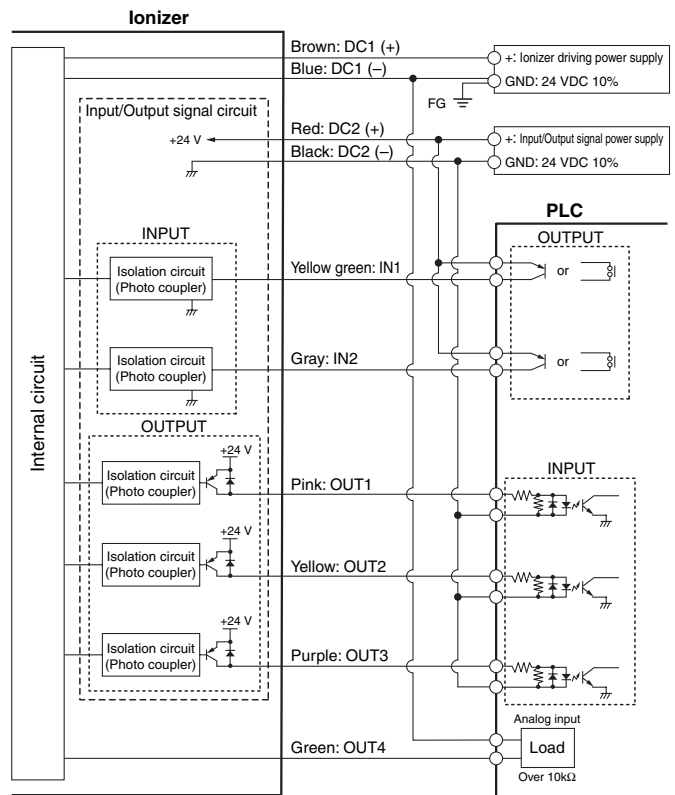
Power supply 24 VDC	Input	ON OFF	
Electricity discharge stop signal	Input	ON OFF	
State of emitting ions		ON OFF	

Connection Circuit of Power Cable

■ NPN specification



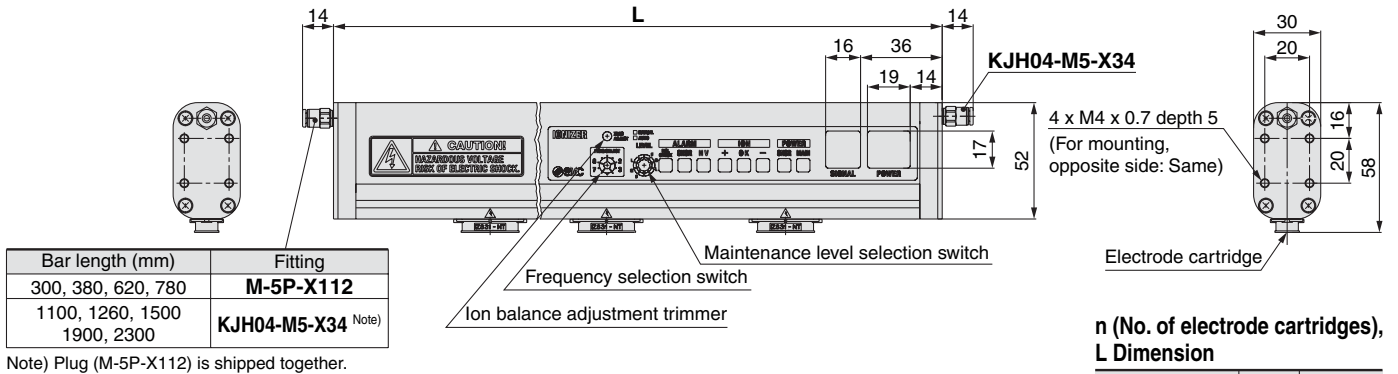
■ PNP specification



Note) The sensor monitor output (OUT4: Green) is not isolated from the ionizer's internal circuit and is therefore wired to the FG terminal.

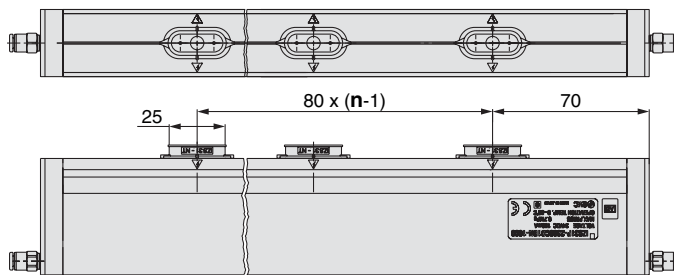
Dimensions

Ionizer / IZS31-□□□□-□□

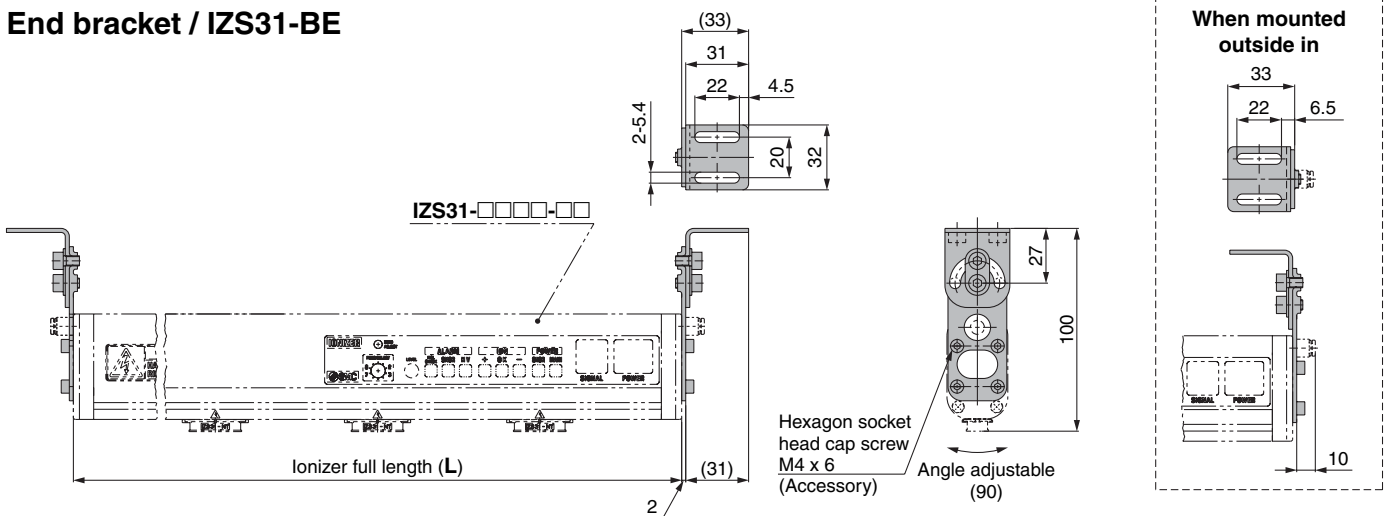


n (No. of electrode cartridges), L Dimension

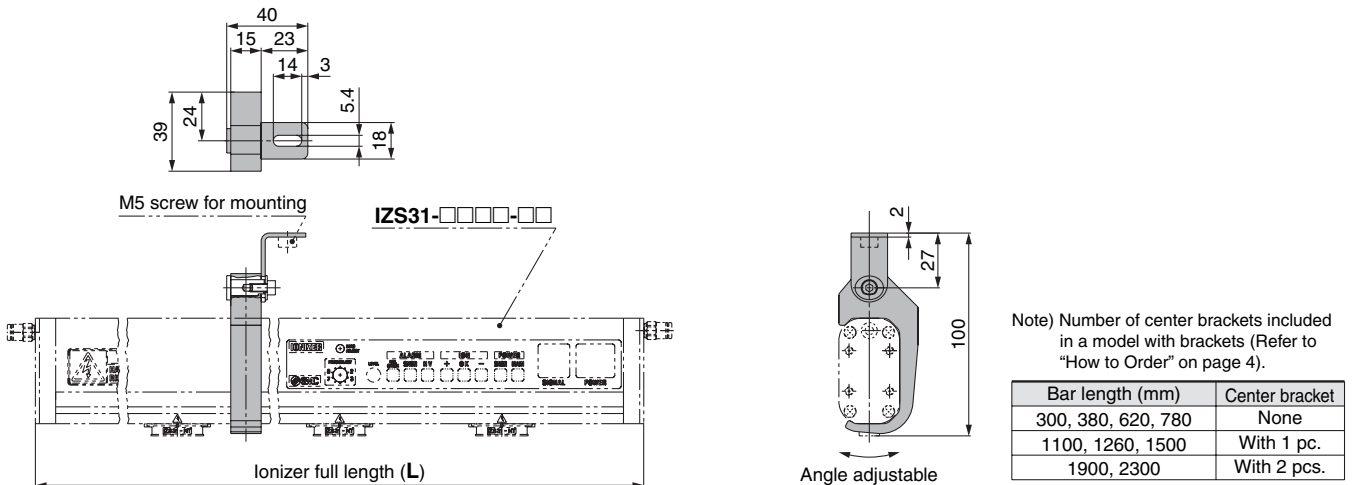
Part no.	n	L (mm)
IZS31-300	3	300
IZS31-380	4	380
IZS31-620	7	620
IZS31-780	9	780
IZS31-1100	13	1100
IZS31-1260	15	1260
IZS31-1500	18	1500
IZS31-1900	23	1900
IZS31-2300	28	2300



End bracket / IZS31-BE



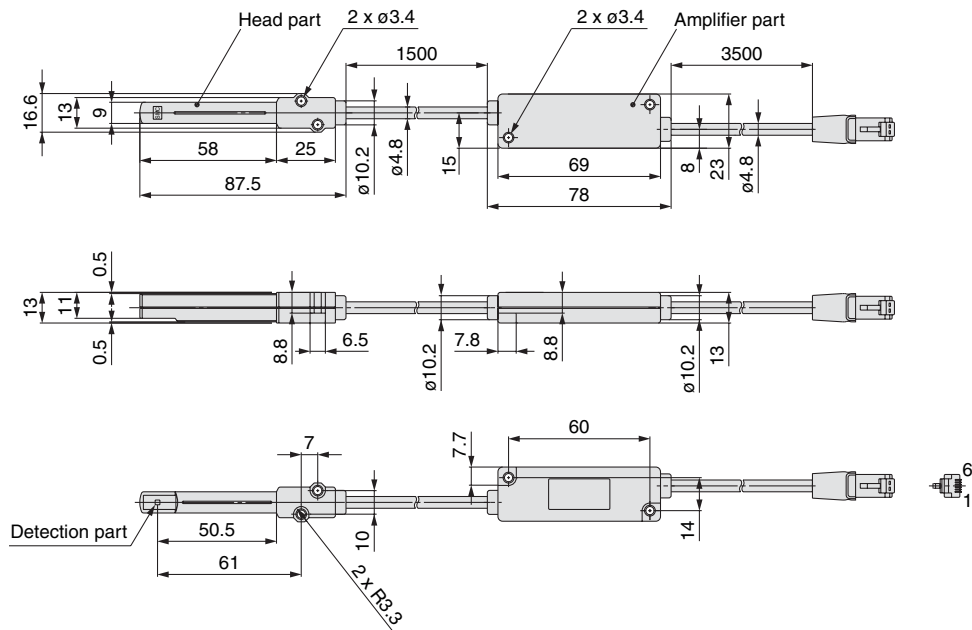
Center bracket / IZS31-BM



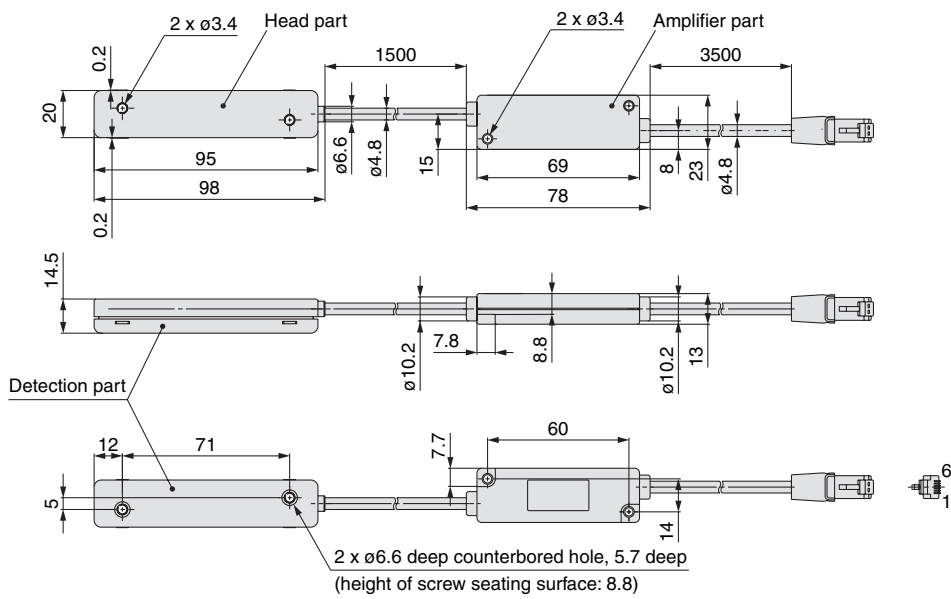
Series IZS31

Dimensions

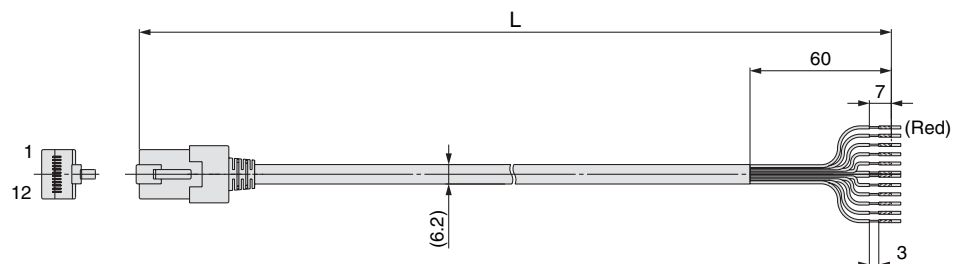
Feedback sensor / IZS31-DF



Autobalance sensor / IZS31-DG



Power supply cable / IZS31-CP□



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

Series IZS Made to Order 1

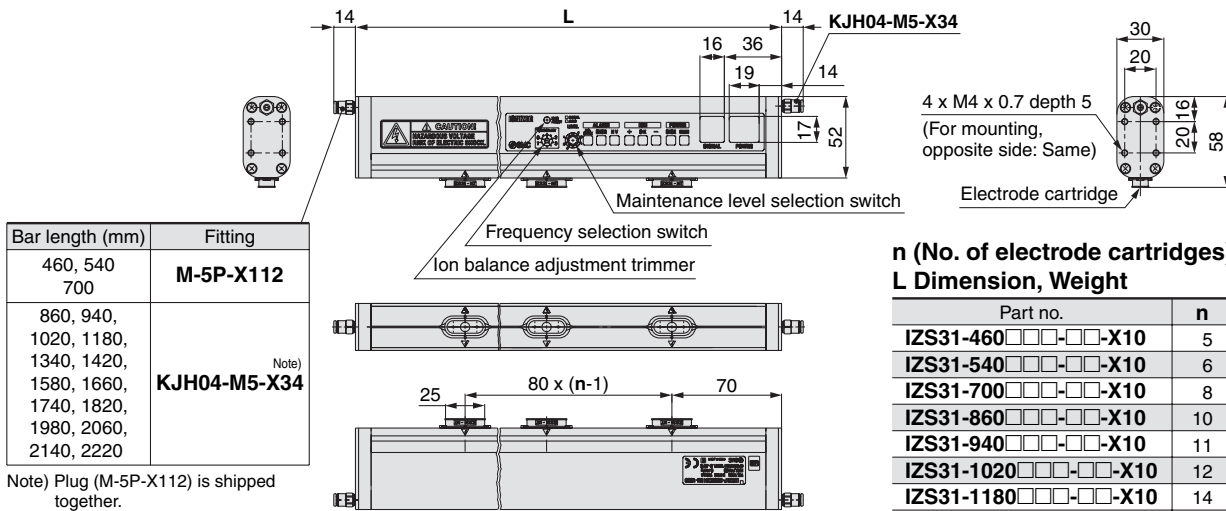
For detailed dimensions, specifications and delivery time, please contact SMC.



1 Non-standard bar length compliant

Symbol
X10

* For "How to Order", refer to page 4.



**n (No. of electrode cartridges),
L Dimension, Weight**

Part no.	n	L (mm)	Weight (g)
IZS31-460□□□-□□-X10	5	460	600
IZS31-540□□□-□□-X10	6	540	660
IZS31-700□□□-□□-X10	8	700	780
IZS31-860□□□-□□-X10	10	860	910
IZS31-940□□□-□□-X10	11	940	970
IZS31-1020□□□-□□-X10	12	1020	1040
IZS31-1180□□□-□□-X10	14	1180	1160
IZS31-1340□□□-□□-X10	16	1340	1290
IZS31-1420□□□-□□-X10	17	1420	1350
IZS31-1580□□□-□□-X10	19	1580	1480
IZS31-1660□□□-□□-X10	20	1660	1540
IZS31-1740□□□-□□-X10	21	1740	1600
IZS31-1820□□□-□□-X10	22	1820	1660
IZS31-1980□□□-□□-X10	24	1980	1790
IZS31-2060□□□-□□-X10	25	2060	1850
IZS31-2140□□□-□□-X10	26	2140	1920
IZS31-2220□□□-□□-X10	27	2220	1980

No. of Center Brackets

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

2 Power supply cable, made-to-order component

Symbol
X13

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

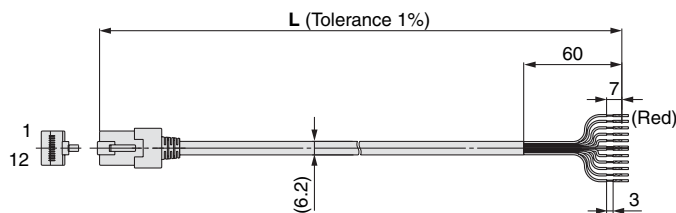
Note 1) 11 mm or longer power supply cables are not CE Marking-compliant.
Note 2) Use standard power supply cables for 3 m and 10 m lengths.

How to Order

IZS31 – CP □ – X13

Cable length

Symbol	L: Cable length
01	1000 mm
02	2000 mm
04	4000 mm
05	5000 mm
06	6000 mm
07	7000 mm
08	8000 mm
09	9000 mm
11	11000 mm
12	12000 mm
13	13000 mm
14	14000 mm
15	15000 mm
16	16000 mm
17	17000 mm
18	18000 mm
19	19000 mm
20	20000 mm



Series IZS Made to Order 2

For detailed dimensions, specifications and delivery time, please contact SMC.



3 Model with 40 mm-pitch electrode cartridges

Symbol

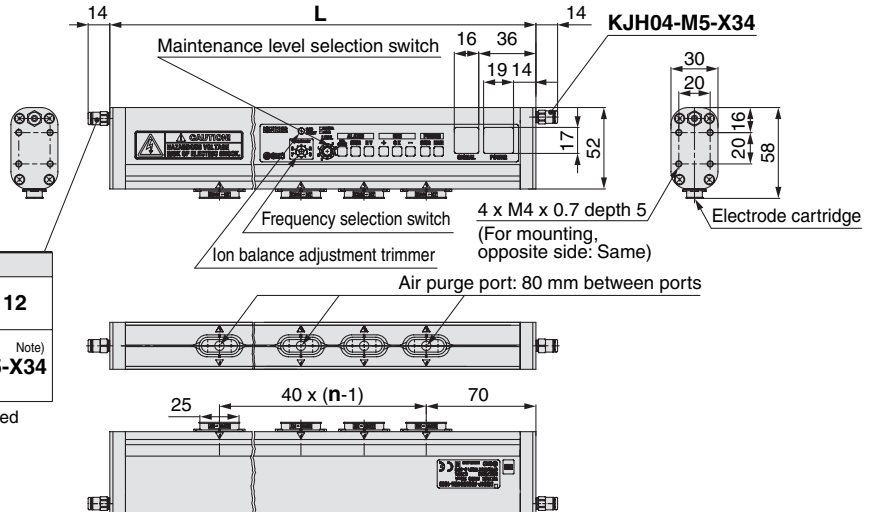
X15

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

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

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

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



**n (No. of electrode cartridges),
L Dimension, Weight**

Part no.	n	L (mm)	Weight (g)
IZS31-300 □□□-□□- X15	5	300	480
IZS31-380 □□□-□□- X15	7	380	540
IZS31-620 □□□-□□- X15	13	620	740
IZS31-780 □□□-□□- X15	17	780	880
IZS31-1100 □□□-□□- X15	25	1100	1140
IZS31-1260 □□□-□□- X15	29	1260	1270