



Installation and Maintenance Manual

Nozzle Type Ionizer

Series IZN10



1 Safety Instructions

- This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.
- Read this manual before using the product, to ensure correct handling and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of "DANGER", "WARNING" or "CAUTION", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.
- This product is class A equipment that is intended for use in an industrial environment.

⚠ DANGER	DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

1.1 General recommendations

⚠ WARNING

- The compatibility of equipment is the responsibility of the person who designs the systems or decides the specifications.**
Since the products specified here can be used in various operating conditions, their compatibility with the specific system must be based on specifications or after analysis and/or tests to meet the specific requirements. Those who decide the compatibility of equipment shall take the responsibility to guarantee the initial system performance and safety. Construct the system after reviewing all the specifications in the latest catalogue or documentation, as well as considering the implications of the failure of any piece of equipment.
- Only trained personnel should operate machinery and equipment.**
This product generates high voltages; therefore it can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of systems should be performed by trained and experienced personnel only.
- Do not service machinery/equipment or attempt to remove components until safety is confirmed.**
1) Inspection and maintenance of the machinery and equipment should be performed after confirmation of safety, considering such areas as earthing, prevention of electric shock and other types of injury.
2) When equipment is to be removed, confirm the safety process as mentioned above. Cut air pressure and electrical power supplies which are the energy sources for the equipment and exhaust all residual compressed air in the system.
3) Before machinery/equipment is re-started, take measures to prevent short circuit, etc.
- Do not use the product under the following conditions or environments. If it is unavoidable, take appropriate measures and contact SMC.**
1) Conditions and environments beyond the given specifications or if product is to be used outdoors.
2) Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications or safety equipment.
3) An application that has the possibility of having negative effects on people, property or animals requires a special safety analysis.

1 Safety Instructions (continued)

1.2 Specific recommendations

⚠ WARNING

- This product is intended for use in general factory automation systems.**
If other applications (especially the ones indicated in section 1.1) are used, please contact SMC before use.
- Use within specified voltage and temperature limits.**
Voltage out of specification may cause malfunction, damage, electric shock and/or fire.
- Use clean, compressed air for fluid.**
Do not use flammable or explosive gas for fluid as it may cause fire or explosion. When fluids other than compressed air are used, please contact SMC service representative.
- This product does not have an explosion-proof construction.**
Do not use this product in areas where dust explosions may be triggered, or where flammable or explosive gas is present as this too may cause explosions and/or fire.

⚠ CAUTION

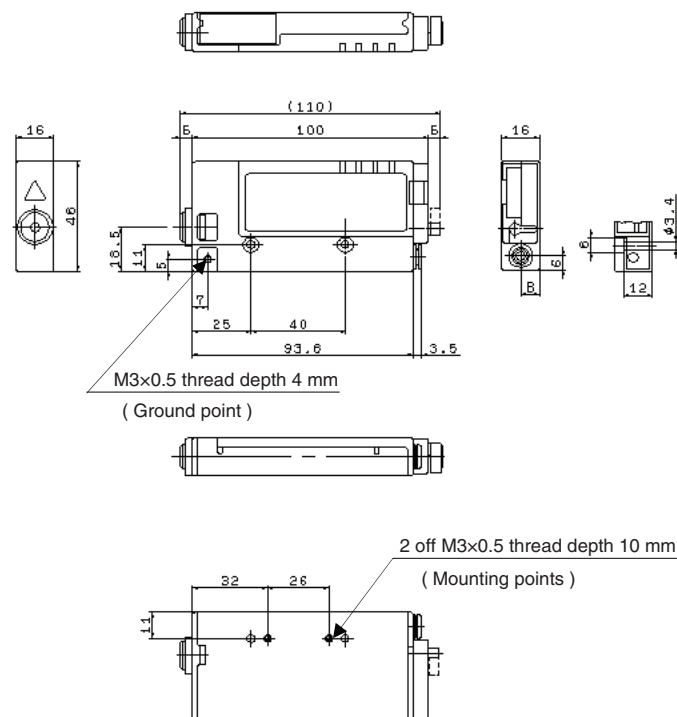
- This product has not been cleaned.**
When using this product in a clean room environment, flush and confirm the product's purification level before use.
- This product has a very sharp electrode.**
When using or cleaning the product do not touch the electrode as injury may result.

2 Intended Conditions of Use (continued)

2.2 Outline

IZN10-01 / IZN10-02

Energy-saving nozzle / Large-flow nozzle



2 Intended Conditions of Use

2.1 Specifications

Ionizer model	IZN10-□□ (NPN)	IZN10-□□P (PNP)	
Type	Corona discharge		
Voltage supply method	High frequency AC type		
Discharge output ^{Note 1)}	2500 V		
Ion balance ^{Note 2)}	±10 V max.		
Ozone generation ^{Note 3)}	0.03 ppm (0.05 ppm for energy saving charge elimination nozzle)		
Air purge	Fluid	Air (clean and dry)	
	Operating pressure ^{Note 4)}	0.05 MPa ~ 0.7 MPa	
	Connection tube size	φ6 mm and φ1/4 inch	
Power supply voltage	24 VDC ± 10 %		
Current consumption	80 mA (When input and output signals are not used)		
Input signal	Discharge stop signal	GND to connection	+24 V to connection
	Reset signal	Current consumption:	Current consumption:
	Maintenance start-up signal	5 mA or less	5 mA or less
Output signal	Discharge signal	Max. load current:	Max. load current:
	Error signal	40 mA	40 mA
	Maintenance signal	Residual voltage: 1 V or less (with load current of 40 mA)	Residual voltage: 1 V or less (with load current of 40 mA)
Max. applied voltage:	28 VDC		
Effective elimination distance	20 ~ 500 mm		
Ambient temperature	0 to 55 °C		
Ambient humidity	35 to 65 % RH (Non condensing)		
Material	Body: ABS, Stainless steel Nozzle: Stainless steel Electrode: Tungsten		
Vibration resistance	Endurance 50 Hz Amplitude 1 mm 2 hours to X, Y, Z each direction of vibration		
Impact resistance	10 G		
Weight	120 g		
Applicable standard/ directive	CE marking		

Note 1) Measurement probe: 1000 MΩ, 5 pF.
 Note 2) Distance between the charged object and ionizer: 100 mm, air purge: 0.3 MPa, using energy saving charge elimination nozzle.
 Note 3) Value above background level, measured 300 mm from front face of nozzle.
 Note 4) Without air purge, charge elimination is not available and internal ozone concentration will increase, adversely affecting the product and peripheral equipment.

3 How to order

Series name: IZN10 - 01 P 06 Z - B1

IZN10 - 01 P 06 Z - B1

Series name: IZN10 High frequency AC type

Nozzle shape:
 01 Energy saving charge elimination nozzle
 02 Large flow nozzle

Output specification:
 Nil NPN
 P PNP

Piping diameter:
 06 φ 6 mm: metric
 07 φ 6.35: 1/4 inch
 16 φ 6 mm: metric (elbow)
 17 φ 6.35: 1/4 inch (elbow)

Power supply cable:
 Nil 3 m
 Z 10 m
 N Not provided

Bracket:
 Nil Without bracket
 B1 With L type bracket
 B2 With pivoting bracket
 B3 With DIN rail mounting bracket

3 How to order (continued)

Accessories

Power supply cable	
IZN10-CP	3 m
IZN10-CPZ	10 m

Bracket

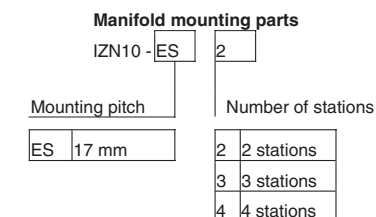
IZN10-B1	L-shaped bracket
IZN10-B2	Pivoting bracket
IZN10-B3	DIN rail mounting

Service parts

Electrode	
IZN10-NT	Electrode assembly
IZS30-M2	Electrode cleaning kit

Option

Manifold mounting parts set
 Hexagon socket head bolt, spacer and hexagon nuts are included.
 The ionizer and L-shaped or DIN rail mounting brackets need to be ordered separately.



4 Installation

4.1 Environment

⚠ WARNING

- Use within operating fluid and ambient temperature .**
The operating fluid and ambient temperature range for the ionizer is 0 to 55 °C. In areas where sudden temperature changes occur, even when these changes are within the specified temperature range, condensation may form. The ionizer should not be used in such conditions.
 - Do not use this product in an enclosed space.**
This product utilizes the corona discharge method of operation and as this process generates small amounts of ozone and NOx, the ionizer must only be used in open, well-ventilated areas.
 - Environments to avoid**
Do not use or store under the following conditions, as these may cause equipment failure:
 - Ambient temperatures outside the range 0 to 55 °C.
 - Ambient humidity outside the range 35 to 65 % RH.
 - Areas where rapid temperature changes may cause condensation.
 - Areas where corrosive gas, flammable gas or other volatile flammable substances are stored.
 - Areas where the product may be exposed to conductive powder such as iron powder or dust, oil mist, salt, organic solvent, machining chips, particles or cutting oil.
 - Directly in the path of air conditioners.
 - In enclosed, poorly ventilated areas.
 - Exposed to direct sunlight and/or radiant heat.
 - Areas where strong electromagnetic noise is generated, such as strong electrical and magnetic fields or supply voltage spikes.
 - Areas where the product may be subject to electro-static discharge.
 - Areas where RF noise is generated.
 - Areas prone to lightning strikes.
 - Areas where the product may receive direct impact or vibration.
 - Areas where the product may be subject to forces or weight that could cause physical deformation.
- If any of these conditions are unavoidable, take appropriate protection measures.

4 Installation (continued)

4. Do not use air containing mist or dust.

Air containing mist or dust may lower function and shorten the maintenance cycle. Use a dryer (IDF series), air filter (AF/AFF series), and mist separator (AFM/AM series) to produce clean compressed air.

5. The ionizer is not immune to lightning strikes.

Protection against electrical surges due to lightning should be incorporated into the equipment.

4.2 Wiring and Piping

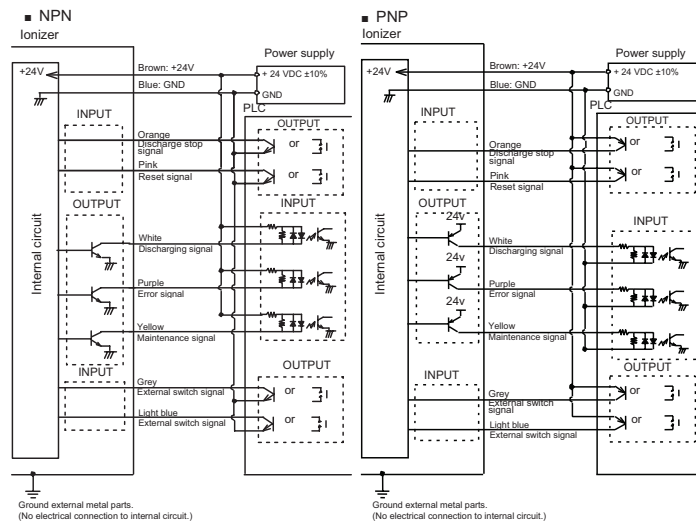


WARNING

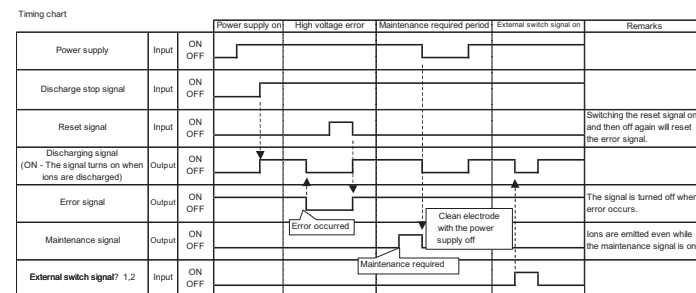
1. Only connect to SELV type external circuits.
2. Ensure that the power supply capacity is sufficient and the voltage is within specification before connecting.
3. Always use a UL listed / recognized power supply, which must be a class 2 power supply of 24 Vdc and limited to 2.1 A.
4. To maintain product performance and to prevent electrical shock connect a protective earth in accordance with instructions in this manual.
5. Ensure power supply is completely disconnected when wiring, this includes plugging in or removing connectors as the product may be damaged.
6. Check wiring is correct and confirm safety, before powering up the product. Incorrect wiring may cause product damage or malfunction.
7. Do not route product wires and cables together with power or high-voltage cables to prevent malfunction due to noise.
8. Flush pneumatic piping before installation. Ensure that all dust, water droplets, oil, etc. are removed before piping.

4.3 Electrical Connection

1. NPN and PNP Circuits



2. Timing chart

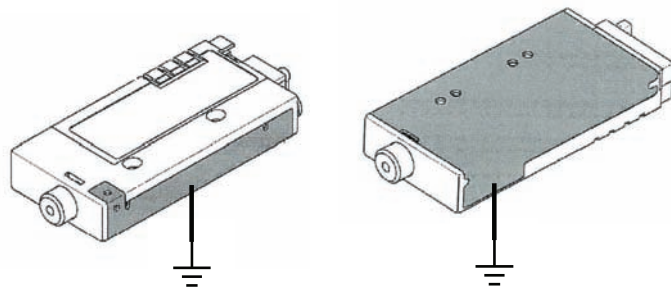


4 Installation (continued)

3. Wiring Tables

No.	Cable colour	Signal name	I/O	Connection	Specification
1	Brown	Power supply +24 V	-	○	-
2	Blue	Power supply GND	-	○	-
3	Orange	Discharge stop signal	Input	○	When the signal is OFF, discharge stops.
4	Pink	Reset signal	Input	○	When the signal is turned on and then off, the error signal is reset. When the signal is turned off: Normal operation continues
5	White	Discharging signal	Output	○	The signal stays ON during discharge
6	Purple	Error signal	Output	○	The signal is turned off when an error occurs.
7	Yellow	Maintenance signal	Output	○	The signal is turned on when maintenance is due.
8	Grey	External switch signal 1	Input	○	When the signal is turned on, discharge stops.
9	Light blue	External switch signal 2	Input	○	When the signal is turned on, discharge stops.

- Minimum number of connections required to operate the ionizer.
- In addition to the above wiring, ensure the external face of the product (metal shaded part) is connected to protective ground. If grounding is not provided or is insufficient, the specified charge elimination capability is not available and the maintenance signal will be ON.



• Input signal

NPN: The signal is ON when the product is connected to the power supply GND and OFF when disconnected.

PNP: The signal is ON when the product is connected to the 24 V power supply and OFF when disconnected.

• Output signal

NPN: Signal is ON when an output transistor is energized (by the power supply GND inside the product) and OFF when de-energized.

PNP: Signal is ON when an output transistor is energized (by the 24 V power supply inside the product) and OFF when de-energized.

4.4 Mounting



WARNING

1. Install only where there is adequate space for maintenance, wiring and piping.

When installing the electrical connector and one touch pneumatic fitting, ensure sufficient room is left for easy insertion and removal of electrical cable and pneumatic tube.

Do not install with sharp bends in the cable or tube. With consideration of the minimum bend radius given below, ensure that cable and tube entries are straight, and do not apply stress to the electrical connectors or pneumatic fittings. If the connectors or fittings are subject to mechanical stress, malfunctions such as broken wires, air leaks or fire may occur.

Minimum bending radius: Power supply cable35 mm

Note: This is the minimum bend radius at 20 °C. If installation is at a lower temperature, the values will be greater.

Refer to specific catalogue for the minimum bend radius of the pneumatic tube.

2. Install only on a flat surface.

A curved or uneven mounting surface may cause excessive force to be applied to the frame or case. This force, as well as a heavy impact (e.g. from dropping the ionizer) may result in damage and failure.

4 Installation (continued)

3. Do not use in areas subject to electrical noise.

It may cause malfunction, deterioration or damage to internal components. Take measures to prevent noise at source and avoid power and signal lines from coming into close contact.

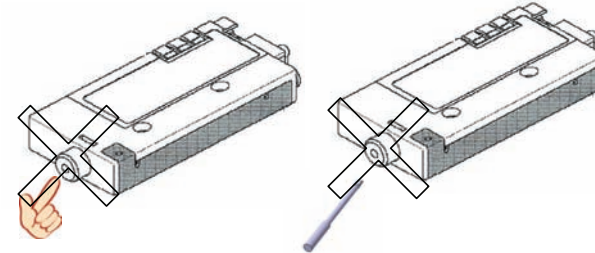
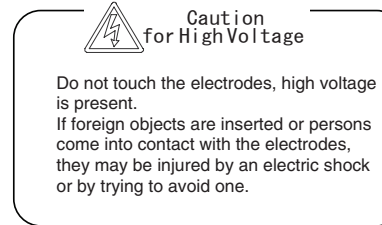
4. Tighten with the specified torque.

Refer to the following table for the correct tightening torque. If the tightening torque is exceeded the mounting screws and brackets may be broken. If the tightening torque is insufficient, the mounting screws and brackets may become loose.

Screw size	Recommended tightening torque (N•m)
M3	0.61 to 0.63

5. Do not touch the electrodes directly, by hand or with a metal tool.

If the electrodes are touched by hand or with a metal tool, not only may it interfere with the specified function and performance of the ionizer, but may also cause operational failure or accident.



6. Do not apply tape or seal to the product.

If conductive adhesive or reflective paint is contained in the tape or seal, it is possible that due to the dielectric effect, charge could build up causing an electro-static discharge or electrical leakage.

7. Install or adjust the product only after power supply is removed.



CAUTION

1. Keep the minimum free space of 100 mm, around the ionizer for correct operation, installation and maintenance.

Walls or other objects that are present within the minimum free space area can interfere with the operation of the ionizer, reducing the efficiency of static charge removal.

2. Be sure to check the effect of static charge removal after installation.

The effectiveness of static charge removal varies depending on the installation and operating conditions.

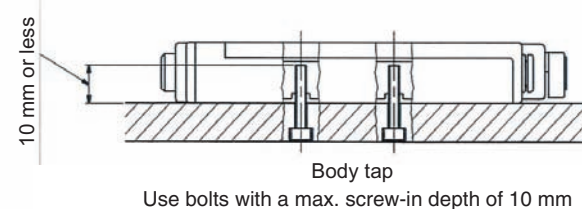
4.4.1 Installation of ionizer

Investigate the places where static problems occur, or places where processes and parts generate ESD (electro-static discharge), and carefully consider the required conditions to ensure appropriate static charge removal before installation.

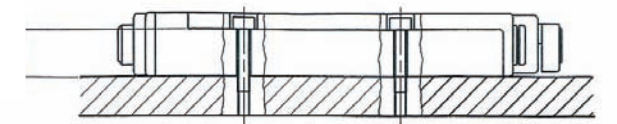
When mounting the product, use M3 hexagon socket head bolts. Tightening torque is 0.61 to 0.63 N•m.

(1) Body mounting: Tap or through hole.

Refer to the figure below, affix the product using hexagon socket head bolts with optimum length.



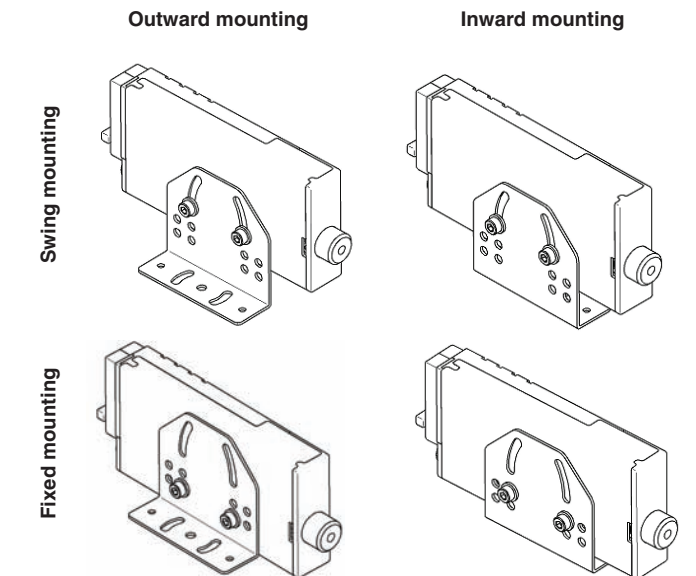
4 Installation (continued)



Through hole.
Use bolts with a min. length of 12 mm.

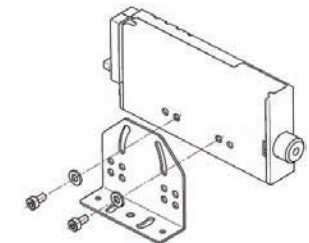
(2) L-shaped bracket.

The L-shaped bracket can be mounted in 4 different ways as shown below.

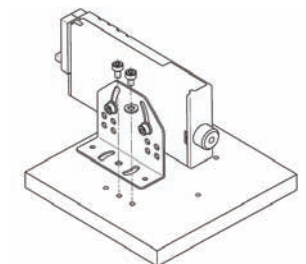


(3) Outward mounting of L-bracket.

1. Use the hexagon socket head bolts (M3 X 6) and washers that are supplied attached to product and mount the L-bracket.

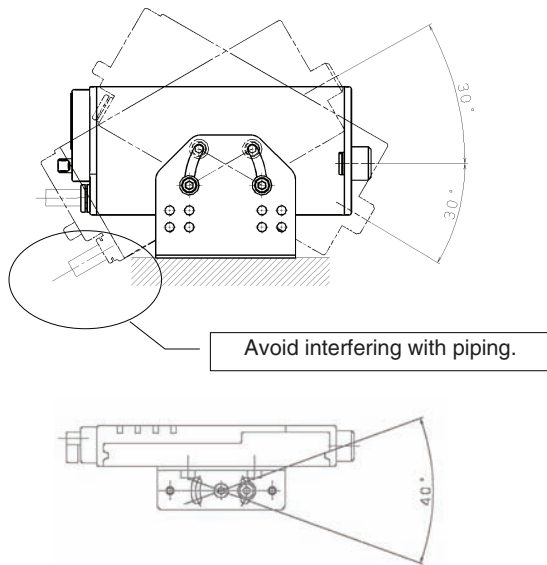


2. Adjust angle of the ionizer body to ensure proper static charge removal and fix it in position with the bracket locking screws. For the slotted hole, use the washer attached to the product. Hexagon socket head bolts are not included and need to be provided separately.



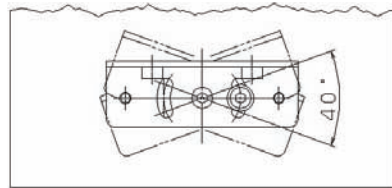
4 Installation (continued)

3. The mounting angle of the product can be adjusted within the following range.

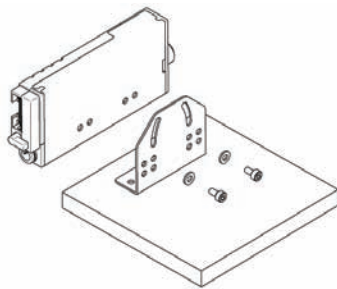


(4) Inward mounting of L-bracket

1. Before mounting the product, mount the L-shaped bracket where the product will be installed. The mounting angle of the bracket can be adjusted in the following range. Hexagon socket head bolts are not included with the product and need to be provided separately.

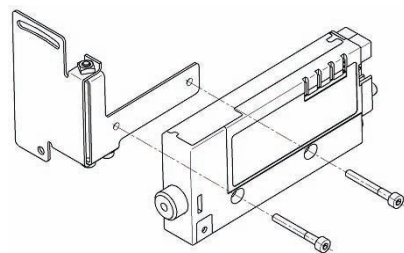


2. Affix the product with the hexagon socket head bolts (M3 X 6) and washers that are supplied attached to the product. Tightening torque is 0.61 to 0.63 N•m.



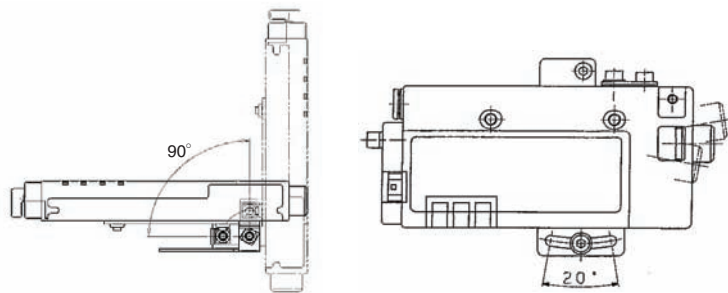
(5) Pivoting bracket

1. Mount the pivoting bracket to the product with the hexagon socket head bolts and washers that are supplied attached to the product. Tightening torque is 0.61 to 0.63 N•m.



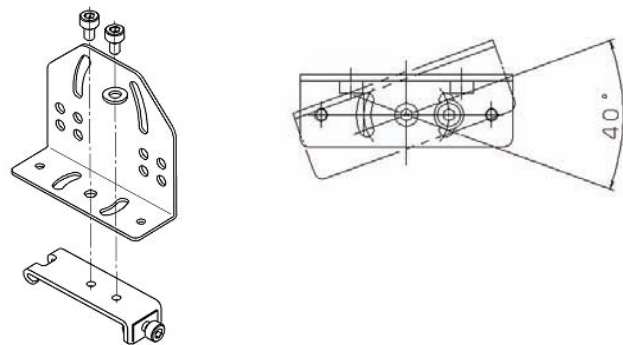
4 Installation (continued)

2. Adjust the product to the desired mounting angle and secure in position.

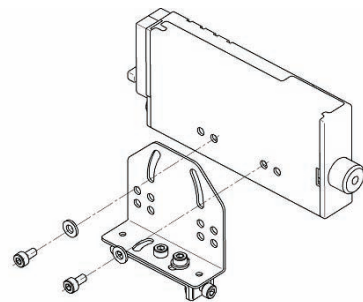


(6) DIN rail mounting bracket

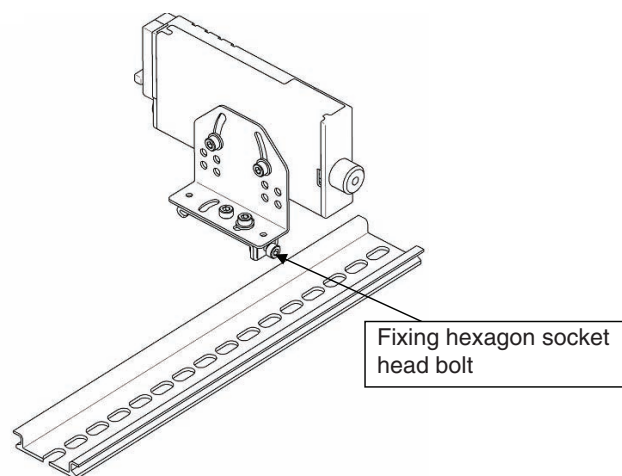
1. Adjust the L-bracket to the desired angle and fix in position.



2. Mount the L-bracket to the product with the hexagon socket head bolts (M3 X 6) and washers that are supplied attached to the product.



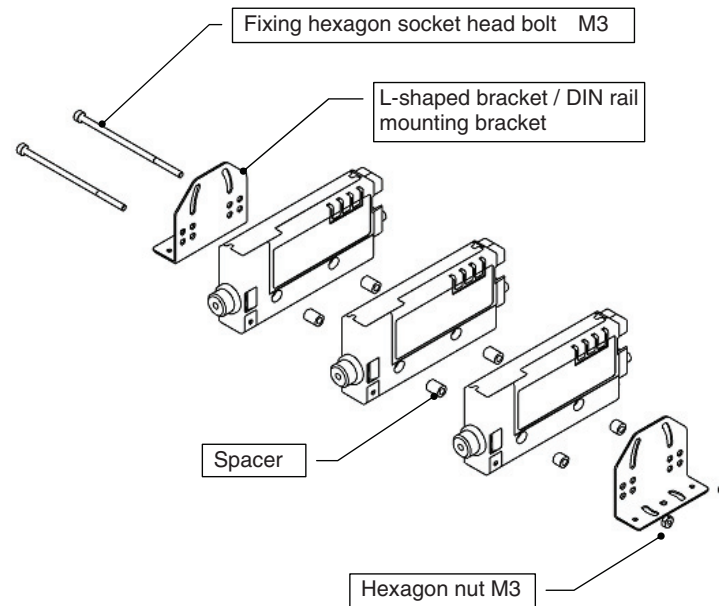
3. Mount the product to the DIN rail and tighten the socket head bolts to secure.



4 Installation (continued)

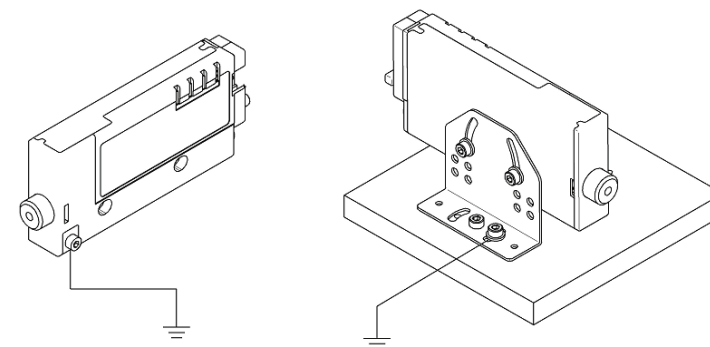
(7) Mounting of multiple ionizers

1. Insert the spacers between the counter bores of the body.
 2. Hold the product by L-shaped brackets from both ends and tighten the hexagon socket head bolts. Tightening torque is 0.61 to 0.63 N•m.
 The composition of parts to connect 3 ionizers is shown below.



(8) Make certain the lead wire [blue] of the power supply cable is connected to protective ground.

If the lead wire is not grounded, the ion balance will be unstable, and there will be the possibility of electric shock, also the ionizer and connected power supply may be damaged.



5 Functional Explanation

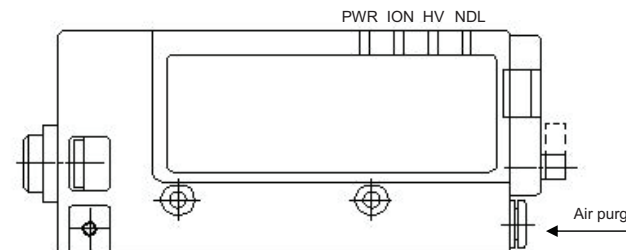
1. Detection of contamination on electrode

During operation reduced charge elimination capability due to contamination or wear of the electrode is monitored continuously. If it becomes necessary to clean the electrode, the LED for maintenance lights up on the display of the product and maintenance output signal is generated.

2. Input of external switch signal

There are two ports for external switch signal inputs. If a pressure switch or electrostatic sensor is connected, discharge can be stopped for abnormal pressure or completion of charge elimination.

3. Name of display LEDs.



5 Functional Explanation (continued)

Name	Label	Colour	Content
Power supply	PWR	Green	ON when the power supply is turned on.
Discharge	ION	Green	ON when discharge is performed.
High voltage error	HV	Red	ON when excessive current flows through the electrode.
Maintenance	NDL	Orange	ON when contamination or wear on the electrode is detected.

4. LED state

Item	PWR	ION	HV	NDL	Remarks
Normal operation (Discharge stop signal ON)	•	•			Ion emission
Normal operation (Discharge stop signal OFF)	•				Discharge stopped
Detection of high voltage error	•		•		Discharge stopped due to error being detected
External switch signal 1	•				Discharge stopped due to signal input
External switch signal 2	•				
Detection of contamination on electrode	•	•		•	Ions emitted continuously even when contamination on the electrode has been detected

5. Details of alarm

Description	Content	How to reset
High voltage error	<p>Notifies that excessive current (such as high voltage leakage) has occurred at the electrode. "HV" LED lights up and ion emission is stopped. The error signal is turned off when error occurs.</p>	<p>Turn off the power supply, find and solve the error, restart the power supply. If the error has been corrected, turn the reset signal on and off.</p>
Electrode maintenance	<p>Notifies that maintenance of electrode is necessary. "NDL" LED lights up and maintenance signal is output.</p>	<p>Turn off the power supply, clean the electrode, and then restart the power supply.</p>

6 Maintenance

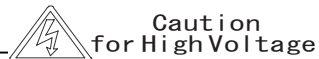
⚠ WARNING

1. Do not drop, hit an object or cause excessive impact (10 G or more) when handling. Although externally the ionizer may not appear to be broken, there may be internal damage causing malfunction.
2. When the cable is inserted or removed, pinch modular plug spring clip with finger and insert or remove the plug in a straight line. If inserted or removed in an inappropriate direction, the mounting part of the modular jack might be damaged leading to operational failure.

⚠ CAUTION

1. Keep electrode clean with regular maintenance.

Make sure that the equipment is operating without any errors by regular maintenance. Only people with sufficient knowledge and experience should perform maintenance of the equipment. Contamination adhering to the electrode, due to long operating periods, reduces the ability of the ionizer to eliminate static electricity. If, after cleaning the electrode, the ionizer does not regain its correct performance, the electrode should be replaced. In order to maintain stable performance, regular maintenance and cleaning of the electrode is recommended.



Caution for High Voltage

A high voltage generating circuit is installed. Ensure the supply voltage is removed before any maintenance is performed. Do not disassemble or modify the product as it may reduce efficiency of the functions and cause injury due to electric shock or electric leakage.

2. The tube and fitting must be treated as consumable parts.

The tube and fitting that are connected to the female piping port of the product can deteriorate due to ozone and need to be replaced regularly

3. The power supply must be removed when cleaning the electrode, or changing the electrode cartridge.

To avoid the risk of electric shock, do not touch the electrode whilst the ionizer has power connected.

4. To avoid electric shock, failure, fire etc. do not service or modify the product.

Non-SMC serviced or modified products are not guaranteed to meet the published specification.

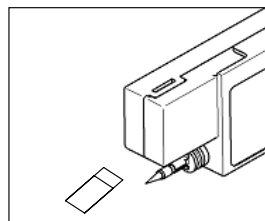
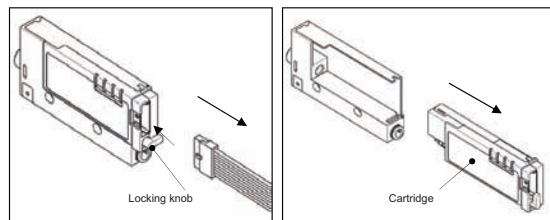
5. Do not operate the product with wet hands.

There is a danger of electric shock.

(1) How to maintain the electrode.

Cleaning of the electrode.

1. Disconnect the power supply cable.
2. Rotate the locking knob and pull down the cartridge.
3. Clean electrode.
4. Mount the cartridge and power supply cable in the reverse order to complete the cleaning.



7 Limitations of Use

⚠ WARNING

Do not exceed any of the specifications laid out in section 2 of this document or the specific product catalogue.

8 Contact

AUSTRIA	(43) 2262 62280	NETHERLANDS	(31) 20 531 8888
BELGIUM	(32) 3 355 1464	NORWAY	(47) 67 12 90 20
CZECH REP.	(420) 541 424 611	POLAND	(48) 22 211 9600
DENMARK	(45) 7025 2900	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	SLOVAKIA	(421) 2 444 56725
FRANCE	(33) 1 6476 1000	SLOVENIA	(386) 73 885 412
GERMANY	(49) 6103 4020	SPAIN	(34) 945 184 100
GREECE	(30) 210 271 7265	SWEDEN	(46) 8 603 1200
HUNGARY	(36) 23 511 390	SWITZERLAND	(41) 52 396 3131
IRELAND	(353) 1 403 9000	UNITED KINGDOM	(44) 1908 563888
ITALY	(39) 02 92711		

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