



Operation Manual

PRODUCT NAME

Separate Controller Ionizer / Slim Bar Type

MODEL / Series / Product Number

IZT45 series

SMC Corporation

Contents

Safety Instructions	3
Limitations of Use	5
1. System construction	1 0
2. Procedures to Operation	1 1
2-1. Flow chart to operation	1 1
2-2. Initial setting of controller	1 2
2-2-1. Operation Overview	1 2
2-2-2. Selection of NPN / PNP as input and output	1 3
2-2-3. Maintenance detection function initialization	1 3
3. Installation and Electrical connection	1 4
3-1. Installation	1 4
3-1-1. Precautions for Installation	1 4
3-1-2. Installation of bracket for bar	1 4
3-1-3. Connecting the controller and high voltage power supply module	1 5
3-1-4. Installing the controller and high voltage power supply module	1 6
3-1-5. Adding a high voltage power supply module	1 7
3-1-6. Routing of cables	2 0
3-1-7. Bar branch wiring	2 3
3-2. Electrical connection	2 4
3-2-1. Ground the F.G. cable	2 4
3-2-2. Grounding at DC mode	2 4
3-2-3. Connecting of the AC adapter	2 6
3-3. How to Check Output Signals	2 6
3-4. Timing chart	2 7
4. Setting	3 7
4-1. Name of Parts	3 7
4-1-1. Controller	3 7
4-1-2. High voltage power supply module	3 8
4-2. Operation modes	3 9
4-3. High voltage power supply module CH number setting	3 9
4-4. Controller setting	4 0
4-4-1. Operation overview	4 0
4-4-2. Channel selection mode.....	4 1
4-4-3. Frequency set mode	4 2
4-4-4. Offset voltage adjustment mode.....	4 3
4-4-5. Balance control selection mode	4 4
4-4-6. Maintenance detection level selection mode.....	4 5
4-4-7. Key-lock setting mode.....	4 6
4-4-8. Ion generation stop mode	4 7
4-5. Alarm function	4 8
5. Performance	5 1
6. How to Order	5 2
6-1. Product number of multiple together	5 2
6-2. Product number for single unit (for individual Parts)	5 3
6-3. Accessories (for individual Parts)	5 4
6-4. Accessories Sold separately	5 5
7. Outline Dimensions	5 6
8. Specification	6 0
9. Interchangeability	6 1
10. Troubleshooting	6 2
11. Maintenance	6 4



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)^{*)}, and other safety regulations.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots
etc.



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.



Warning

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

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.



Safety Instructions

Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.

Use in non-manufacturing industries is not covered.

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.



Limitations of Use

Selection

Warning

1) This product is intended for use in general factory automation equipment.

- If considering using the product for other applications (especially those indicated in (4) on page 3), please consult SMC beforehand.

2) Use within the specified voltage and temperature range.

- Operation with a voltage other than that specified can cause malfunction, damage to the product, electric shock or fire.

3) Use clean compressed air as fluid. (Air quality Class 2.4.3, 2.5.3, 2.6.3 or higher according to ISO 8573-1: 2012 is recommended.)

- Never use flammable gas or an explosive gas as a fluid and never use this product in the presence of such gases.
- This may lead to fire or explosion. Please contact SMC if using for fluids other than compressed air.

4) This product is not designed to be explosion proof.

- Never use in an atmosphere of potentially explosive dust, flammable gas or explosive gas. Fire or an explosion can result.

Caution

1) Clean room specification is not available.

- When using in a clean room environment, confirm the required cleanliness before use.
- Fine particles are generated due to wear of emitters and motor sliding during operation.

Mounting

Warning

1) Reserve an enough space for maintenance and wiring.

- Please take into consideration that the connectors, need enough space for it to be easily attached/detached.
- To avoid unreasonable stress applied to the connector mounting parts, bending of the cable should be more than the minimum bending radius.
- If the cable is bent in an acute angle or load is applied to the cable repeatedly, it may cause malfunction, wire damage or fire.

Minimum bending radius: Power supply cable : 40mm
Separate cable (optional) : 40mm
High voltage cable : 30mm

NOTE: This is an allowable bend radius at 20°C. Bend radius should be larger at lower than 20°C.

2) Wiring high voltage cable

- Use specified cable holder (IZT40-E1 or IZT40-E2) for installing high voltage cables.
- Follow the items below when installing high voltage cables. If items below are not followed, insulation performance of high voltage cable decreases, causing the failure of this product, leading to electrical shock or fire.
 - a. Do not cut the cable.
 - b. Keep the minimum bend radius of the cable.
 - c. Do not tighten the cable too much by tying band. Do not deform the cable by placing object on the cable.

- d. Avoid the factor of cable runaway such as cable duct.
- e. Do not twist or damage to the cable. If the cable is damaged, it should be replaced.

3) Fix the high voltage cable connector using 2 screws included in accessory.

- Fix the connector using 2 cross recessed pan head screws (M4x10) referring to Table 1. Reference of tightening torque.

4) Mount to the flat surface and do not apply impact load or excessive external force.

- Mounting on an uneven surface will apply excessive force to the housing and bracket, which may lead to damage or failure.
- Do not drop or apply excessive shock. Otherwise, damage or an accident may occur.

5) Install the product so that the bar does not have an excessive deflection.

- For a bar length of 680mm or longer, support the bar at both ends and in the middle by using brackets. If the bar is held only at the both ends, self-weight of the bar causes deflection, resulting in damage or deformation to the bar.

6) Avoid using in a place where noise (electromagnetic wave and surge) is generated.

- If the product is used in an environment where noise is generated, it may lead to malfunction or deterioration or damage of the internal elements.
- When the presence of noise is suspected, take preventive measures against noise and avoid the crossing wires such as power line and high voltage line.

7) Tighten the screws to the specified torque.


- If the screws are tightened in excess of the specified torque range, it may damage the mounting screws or mounted areas.
- If the tightening torque is insufficient, the mounting screws and brackets may become loose.

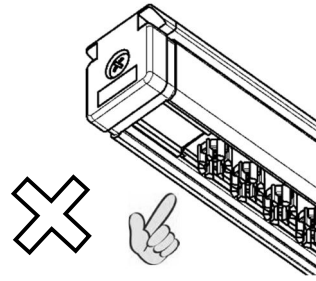
Table 1. Reference of tightening torque

Parts	Product No.	Connection	Screw	Tightening torque	Note
Controller	IZTC45	High voltage power supply module	M4x30 2pcs.	0.22 to 0.24Nm	Direct connection
Separate cable	IZT40-CF□	Controller	Cross recessed (Accessory) 2pcs.	0.25 to 0.35Nm	Separate connection
		High voltage power supply module	Cross recessed (Accessory) 2pcs.	0.25 to 0.35Nm	
		Spacer for separate cable	D-sub connector(plug)	Width across flats 5mm. (Accessory) 2pcs.	
DIN rail mounting bracket	IZT40-B1 / IZT40-B2	Controller	M4x6 2pcs.	1.30 to 1.50Nm	DIN rail mounting bracket
		High voltage power supply module	M4x6 4pcs.	1.30 to 1.50Nm	
		DIN rail	M4x6 2pcs.	1.30 to 1.50Nm	Install to DIN rail
High voltage cable (Controller side)	IZTB44	High voltage power supply module	M4x10 2pcs.	0.49 to 0.53Nm	High voltage cable installation
High voltage cables (Bar side)	IZT43-A002	Bar	M3x6 1pc.	0.30 to 0.40Nm	High voltage cable installation
Cable holder	IZT40-E□	Location	M4x8 (Recommended) 2pcs.	0.19 to 0.21Nm	Wiring High voltage cable

8) Do not directly touch the emitters.

- Do not directly touch the emitter with your finger. If the needle sticks to your finger, or electrical shock makes an instantaneous rapid body motion to escape from the shock, causing injury.
- If emitter or cartridge is damaged by tools, etc., it may interfere with the specified function and performance, and may also cause operation failure and accident.

 **High voltage caution**
 The emitter carries high voltage. If foreign matter is inserted or human body touches the emitter, electrical shock or instantaneous reaction of body to escape from the shock, causing injury.



9) Do not affix any tape or labels to the controller, High voltage power supply module or bar.

- If the tape or label contains any conductive adhesive or reflective paint, a dielectric phenomenon may occur due to ions arising from such substances, resulting in electrostatic charging or electric leakage, causing malfunction, breakage, electric shock or fire.

10) Be sure to remove power supply to the controller, High voltage power supply module and bar before starting the product installation.

- If installation or adjustment is performed being supplied with power, electric shock, failure or injury can result.

11) High voltage power supply module uses a fan. 20mm or more space from the exhaust port is necessary for ventilation.

- Or install the product in a ventilated location so peripheral device are not affected.

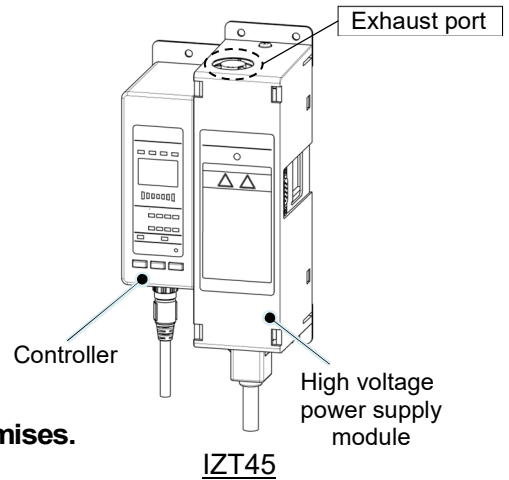
12) Do not damage the cable or apply a heavy object or pinch the cable. Avoid repeatedly bending or stretching the cable.

- It may cause an electric shock, fire, or breaking of wire.

13) Do not carry this product by holding its cables.

- It may cause an injury or damage to the product.

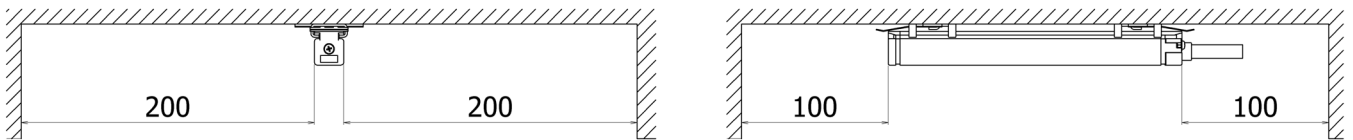
14) This product may cause interference if used in residential premises.



! Caution

1) When installing this product, provide the space shown in the figure below from a wall or structure.

- If there are electrically conductive objects such as walls or structures close to the bar, generated ions may not reach the target object effectively or product failure or electric shock can result due to dielectric or short-circuit.



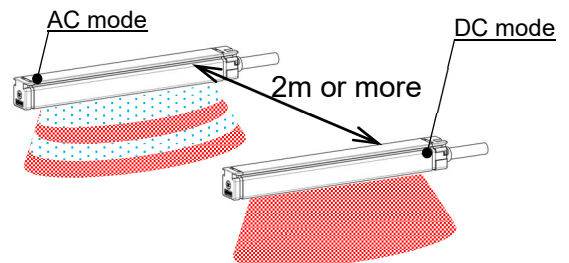
Unit : mm

2) After installation, verify the performance of this product.

- The performance of the product varies depending on the surrounding installation and operating conditions. After installation, verify the performance of this product.

3) When installing ionizers which operate in DC mode (one polarity, positive or negative) with IZT45 close together, they should be positioned at least two meters away from each other.

- When IZT45 which operates in AC close to the Ionizer which operates in DC mode, separate them by at least two meters. The offset voltage (ion balance) may not be adjusted by the built-in sensor due to the ions discharged from the Ionizer which operates in DC mode.



4) Use specified brackets for fixing.

- If use a bracket other than specified bracket, the functions of this product may not operate normally.

5) When the build-in sensor is on and cannot be adjusted ion balance to zero by pressing the button, turn the sensor off.

- The sensor may malfunction if there is an object with too much charge around it.

Electrical Connection

Warning

- 1) Before wiring, ensure that the power supply capacity meets the specification and that the voltage is within the specification. Product damage or malfunction can result.
- 2) To maintain product performance, the power supply should be UL Class 2 certified by National Electric Code (NEC) or evaluated as a limited power source according to UL60950.
- 3) To maintain the product performance, ground the product with an earth ground cable with a resistance of 100 Ω or less. If the product is not grounded, it is not possible to secure the performance and may lead to product failure or malfunction.
- 4) Wiring (including insertion and removal of the power supply connector) should never be carried out with the power supply ON. Otherwise, an electrical shock or accident may occur.
- 5) Use specified cable for connecting the controller, High voltage power supply module and bar for this product. Do not disassemble or retrofit them. Disassembling or modifying the product may cause product, electric shock or fire. The product will not be guaranteed if it is disassembled and/or modified.
- 6) Ensure the safety of wiring and surrounding conditions before supplying power.
- 7) Do not connect or disconnect the connectors (including power source) while the power is supplied. Failure to follow this procedure may cause product malfunction.
- 8) If the power and high voltage cables are routed together, the product may malfunction due to noise. Route the Ionizer wires separately.
- 9) Confirm that the wiring is correct before operation. Incorrect wiring will lead to product damage or malfunction.

Operating / Storage Environment

Warning

- 1) Operate the product in the specified ambient temperature range.
 - Operating ambient temp. range:
Controller 0 to 40°C, high voltage power supply module 0 to 40°C, bar 0 to 50°C, AC adapter 0 to 40°C.
 - Do not use the product in locations where the temperature may change suddenly even if the ambient temperature range is within the specified limits, resulting in condensation.
- 2) Do not use this product in an enclosed space.
 - This product utilizes the corona discharge phenomenon. Do not use the product in an enclosed space as ozone and nitrogen oxides exist, even though in marginal quantities.
- 3) Environments to avoid
 - Never use or store under the following conditions. These may cause an electric shock, fire, etc.
 - a. Use in the environment which ambient temperature is out of the product specification.
 - b. Use in the environment which ambient humidity is out of the product specification.
 - c. Environment where abrupt temperature changes may cause condensation.
 - d. Environment where corrosive gas, flammable gas or other volatile flammable substances are stored.
 - e. Environment 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 (including water and any liquids), etc.
 - f. Paths of direct air flow, such as air conditioners.
 - g. Enclosed or poorly ventilated environment
 - h. Locations which are exposed to direct sunlight or heat radiation.
 - i. Areas where strong electromagnetic noise is generated, such as strong electrical and magnetic fields or supply voltage spikes.
 - j. Environment where static electricity is generated to the product.
 - k. Locations where strong high frequency is generated.
 - l. Locations which are subject to potential lightning strikes.
 - m. In an area where the product may receive direct impact or vibration.
 - n. Areas where the product may be subjected to forces or weight that could cause physical deformation.
- 4) Controller, High voltage power supply module, bar and AC adapter are not resistant to lightning surge.

Maintenance / Check

Warning

1) Perform maintenance regularly and clean the emitters.

- Check regularly that the product is not operating with undetected failures.
- The maintenance must be carried out by an operator who has sufficient knowledge and experience.
- If the product is used for an extended period with dust present on the emitters, the product performance will be reduced.
- Maintenance detection function is installed to this product. When the emitter contamination is detected, clean the emitter.
- In cases where the maintenance detection function is not used on this product is used, perform neutralizing performance test and set maintenance cycle for periodic cleaning.
- Emitter contamination level is different depending on the installation environment.
- If the performance is not recovered after cleaning, it is possible that emitters are worn. Replace the bar.

2) Be sure to remove power supply to the controller bar before cleaning the emitter or replacing the bar.

- Never touch the emitter with the power supplied to the controller or bar. Electric shock may cause injury.
- Securely mount or remove the High Voltage cable referencing the instructions shown "11. Maintenance".

3) Do not disassemble or modify the product.

- Disassembling or modifying the product may cause product, electric shock or fire. The product will not be guaranteed if it is disassembled and/or modified.

4) Do not operate the product with wet hands.

- Never operate the product with wet hands. It may cause electric shock or other accidents.



High voltage caution

- This product contains a high voltage generation circuit. When performing maintenance inspection, be sure to confirm that the power supply to the ionizer is turned off.
- Never disassemble or modify the product, as this can cause loss of product functionality, and there is also a risk of electric shock and earth leakage.

Handling

Caution

1) Do not apply excessive external force or shock (100m/s² or more) to the product

- Even if there are no problems with the appearance of the controller, High-voltage power supply module or bar, the damage of the internal components may cause malfunction.

2) Hold the ends and the middle of the bar so that moment load is not applied.

- Handling the product by holding either end of the bar may cause deformation or damage to the product.

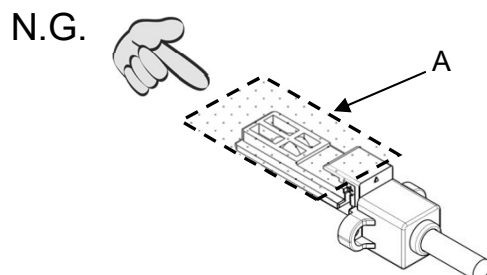
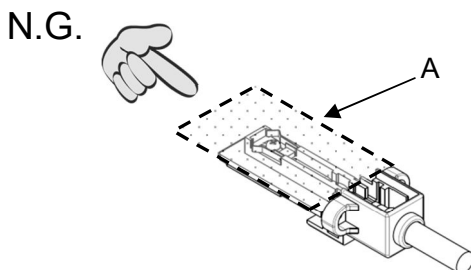
3) Power cable must be connected and disconnected by hand.

- Open and close too much may damage the drain cock.
- Hold the connector by hand and straightly pull it out.

4) If smoking, fire or smell occurs in the product, immediately shut off the power supply.

5) Do not touch the A part of the high voltage connector by hand. Be careful so that moisture or foreign matter does not adhere to the connector.

- Keep the high voltage connector free from contamination. Adhesion of oil or foreign matter on the A part may cause high voltage electric leakage.
- If moisture, oil, or foreign matter adheres to the A part, wipe it with ethanol.



High voltage connector

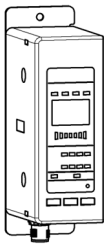
1. System construction

- IZT45 series consists of the bar (ion generator), High-voltage power supply module, and controller. It is necessary to combine each equipment.
- Refer to IZT45 Table of combination below for combining equipment.
- The controller and high voltage power supply module can be directly connected or installed separately.

Table2. IZT44/45 Table of combination

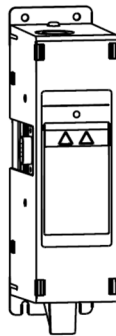
Series	Controller	High voltage power supply module	Ion generator (Bar)
IZT45	IZTC45	IZTP41-L	IZTB44

Controller for IZT45



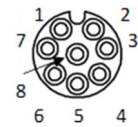
IZTC45 - □□ / Controller

High voltage power supply module for IZT45



IZTP41 - L - □ /
High voltage power supply module

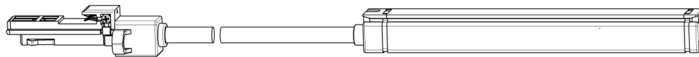
Power cable



Socket
A-coded
(Normal key)

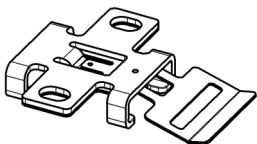
IZT45 - CP□ / Power cable

Bar (Ion generating part. Common to IZT44 and IZT45)

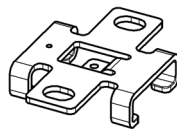


IZTB44 - □ - □ / Bar

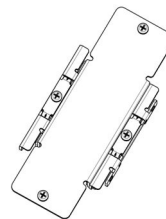
Bracket



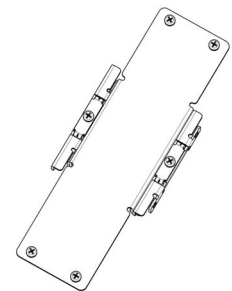
IZT44-BE
End bracket



IZT44-BM
Intermediate bracket

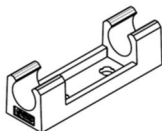


IZT40-B1
For controller

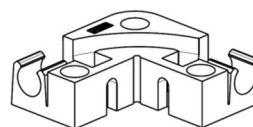


IZT40-B2
For high voltage power supply

High voltage cable holder

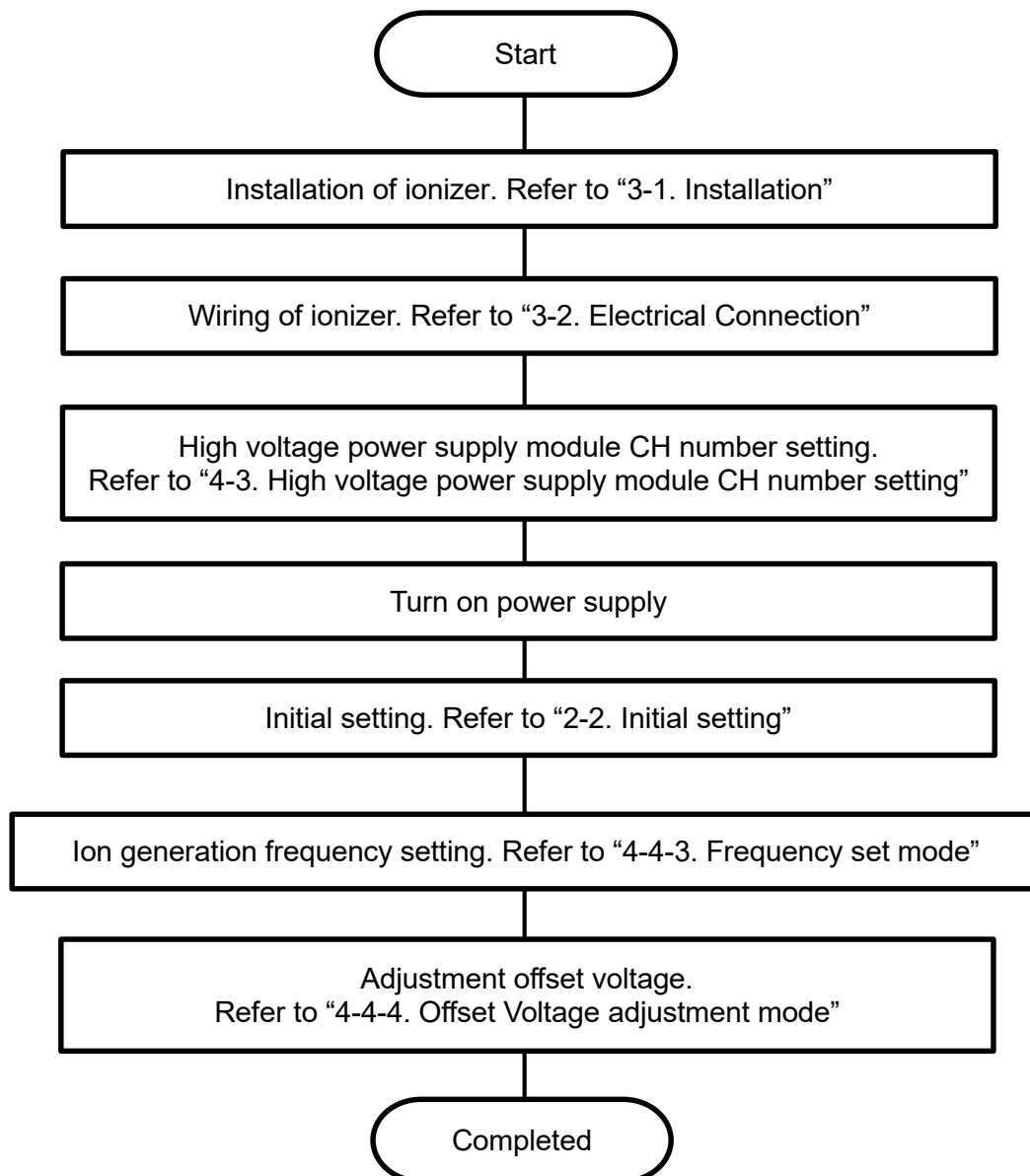


IZT40-E1
High voltage cable holder (Straight)



IZT40-E2
High voltage cable holder (Elbow)

2. Procedures to Operation
2-1. Flow chart to operation



2-2. Initial setting of controller

2-2-1. Operation Overview

Factory Default to Initial Settings

Power is supplied.



[Selecting input/output (NPN/PNP)]
Selects NPN or PNP for input/output.
For details, refer to “2-2-2 Selection of NPN/PNP as input and output”.



Press S button for more than 3 seconds.

[Initial Settings for Maintenance Detection]
Initial settings for maintenance detection are made for the selected bar.
For details, refer to “2-2-3. Maintenance detection initialization”.



Setting time 60s.

Complete.

Resetting input/output

Power is supplied.



Press reset button for more than 3 seconds.

[Selecting input/output (NPN/PNP)]
Selects NPN or PNP for input/output.
For details, refer to “2-2-2 Selection of NPN/PNP as input and output”.



Press S button once.

Complete.

Initial Settings for Maintenance Detection (when replacing bars or changing installations)

Power is supplied.



[CH selection mode].
Selects the CH of the bar for which settings are to be made.



Press reset button once.

[Initial Settings for Maintenance Detection]
Initial settings for maintenance detection are made for the selected bar.
For details, refer to “2-2-3. Maintenance detection initialization”.

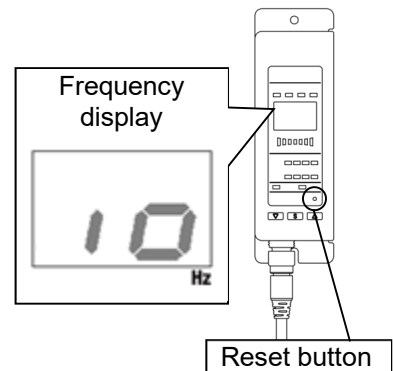
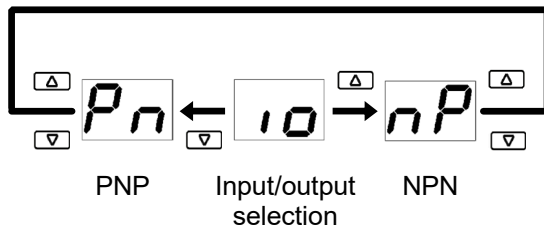


Press S button for more than 3 seconds.
Setting time 60s.

Complete.

2-2-2. Selection of NPN / PNP as input and output

- The input/output specification (NPN/PNP) of external signals can be selected by controller operation.
- When the controller is operated under the factory defaults or the reset button is pressed for more than 3 seconds during use, "io" is displayed in the frequency display section.
- When "io" is displayed, press the ▼ or ▲ button to select NPN or PNP specification. After selecting NPN or PNP, press the S button to go to the initial setting for maintenance detection if the product is operated for the first time from the factory, or to the CH selection mode if done from the reset button, and save the set specification.
- The settings saved here will be maintained until the reset button is pressed for more than 3 seconds.



[Selecting the input/output is necessary in following cases]

- ① When "io" is displayed in the frequency display area.
- ② When the input/output specification of the device used has been changed.

*Press and hold the Reset button and confirm that "io" is displayed in the frequency display section before making settings.

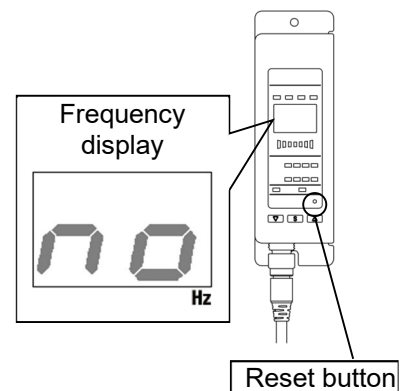
2-2-3. Maintenance detection function initialization

- This product has a function which constantly monitors the emitter contamination. When the emitter contamination is detected, it is indicated by a signal output and LED. Initial setting is necessary for maintenance detection.
- If the product is operated for the first time from shipment, after setting the input/output specifications, "no" is displayed in the frequency display. Select a bar for initialization, and press and hold S button for more than 3 seconds to start initialization.
- Initialization is also required when the bar is replaced or installation environment is changed. If the Reset button is pressed during normal operation, "no" is displayed in the frequency display and the module is initialized. If the S button is pressed and held for more than 3 seconds, the initialization of the selected CH of bar is started. Connect and install the ionizer bar to be used before setting.
- When multiple bars are connected, assign the channel for which initial setting is necessary.
- Refer to "4-4-2. Channel selection mode" for channel setting.
- Do not disconnect the power supply during setting. (Initial setting is completed within 60 seconds.)

[Initial setting is necessary in following cases]

- ① When "no" is displayed in the frequency display.
- ② Bar is replaced.
- ③ Installation environment is changed.

*For ②③, perform initial setting after pressing the reset button and make sure that "no" is displayed in the frequency display. It is recommended to start the initial setting for ③ after replacing the bar. If initial setting is performed while the emitter cartridge is not clean or is worn out, maintenance detection may not work properly.



3. Installation and Electrical connection

- The performance of the product varies depending on the surrounding installation and operating conditions. It is recommended to investigate in advance any processes and parts where static electricity disturbances occur. Verify that the required conditions have been met in order to effectively remove static electricity before installation.
- After installation, verify the performance of this product.

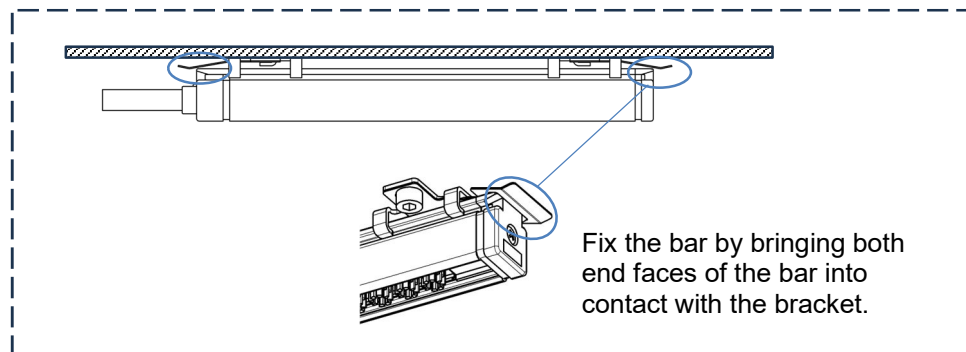
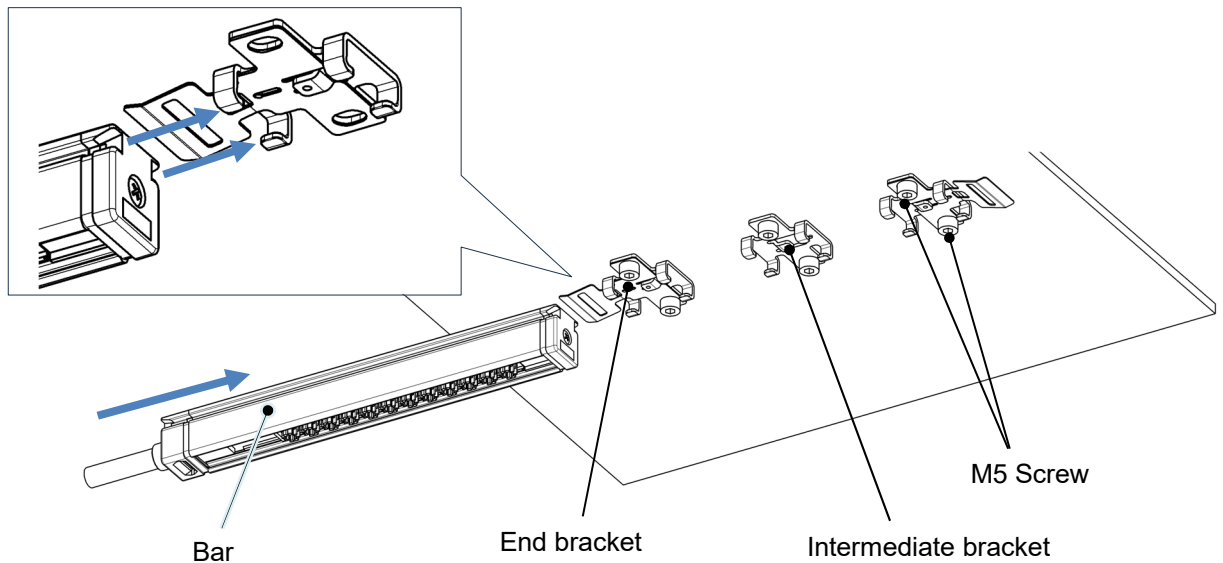
3-1. Installation

3-1-1. Precautions for Installation

- Be sure to stop power supply to the product before starting the product installation.
- Do not affix any tape or labels to the bar. Dielectric phenomenon may occur due to ions arising from such substances, resulting in electrostatic charging or electric leakage.

3-1-2. Installation of bracket for bar

- Fix the bracket to the specified position using M5 screws.
- Refer to "7. Outline Dimensions" section for details. (The screws should be prepared by the user. Fixed part thickness of brackets 2mm, Recommended mounting screw is M5x8)
- Align the grooves on the bar with the end brackets and slide them into place.
- When using intermediate brackets (for bar lengths of 680 mm or longer), install them so that the distance between them and the end brackets on both ends is the same.
- Make sure the bar is secured with the bracket.

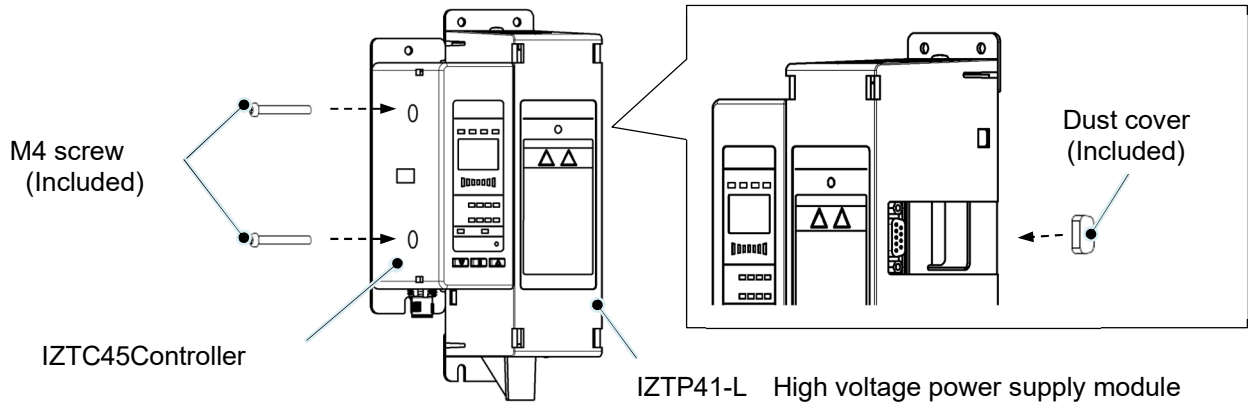


3-1-3. Connecting the controller and high voltage power supply module

- Remove the protection film on the controller before use.
- The product is used by connecting the controller and high voltage power supply module. They can be connected either directly or separately. For separate connection, an optional separate cable is required.
- Mount a dust cover on the D-sub connector when not using the directly mounted high voltage power supply module.

1) Direct connection

- Fix the controller and high voltage power supply module using cross recessed pan head screw (M4x30).
Tightening Torque: 0.22 to 0.24Nm

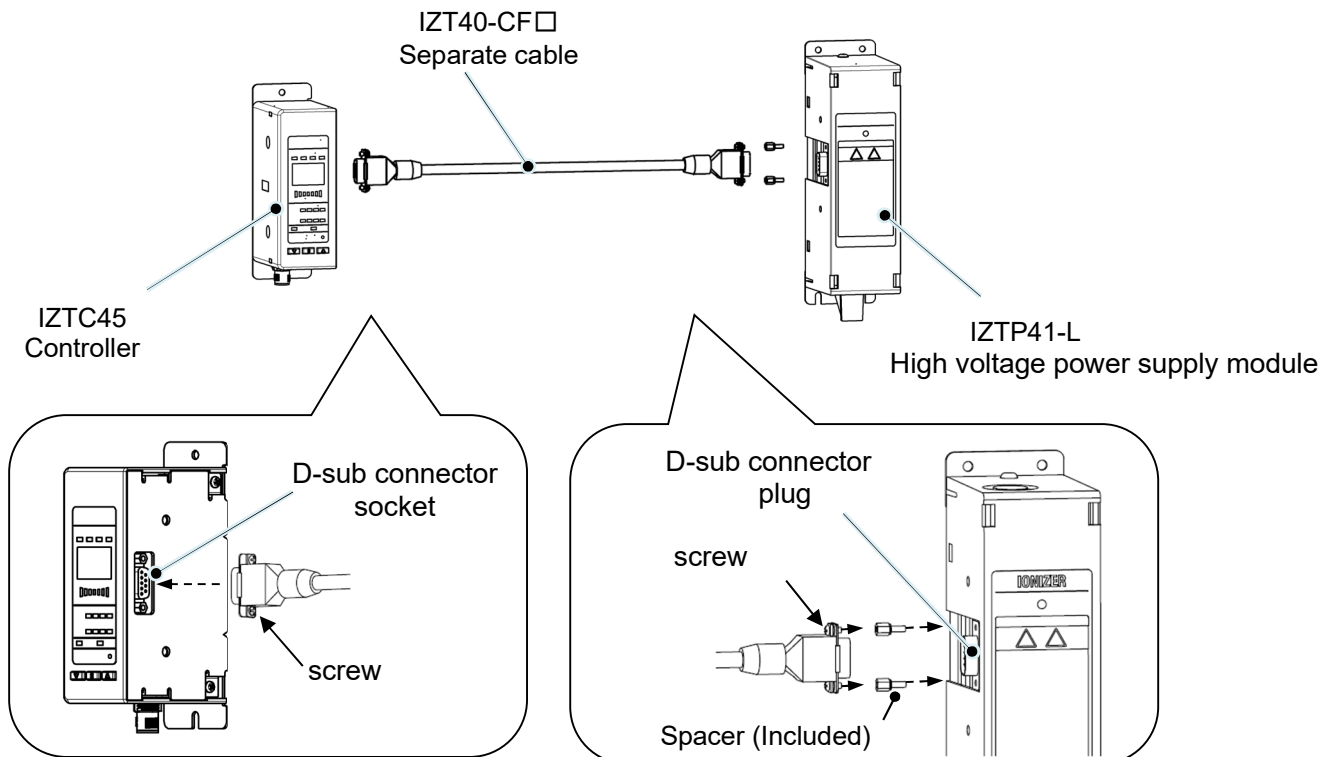


2) Separate connection

- For separate connection, an optional separate cable is required.
- Mount the spacers (included) to fix the separate cable to the high voltage power supply module. Fix the spacers (2 pcs.) to the plug (male side) of the D-sub connector on the high voltage power supply module.
- Connect the controller and high voltage power supply module after mounting the spacers and fix them using 2 pan head combination screws.

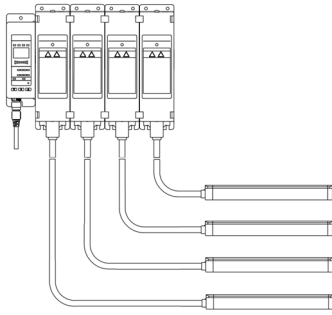
Spacer tightening torque: 0.4 to 0.6 Nm

Separate cable tightening torque: 0.25 to 0.35 Nm

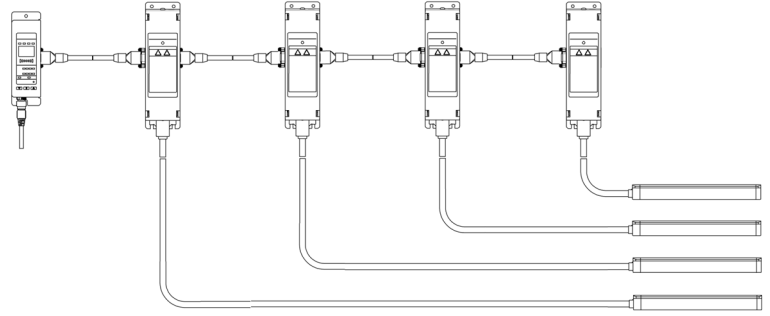


3) Connecting multiple modules.

- Up to 4 high voltage power supply modules can be connected to 1 controller.
- When multiple modules are connected, make sure that the displayed content and the number of connected controller is consistent after power is supplied. (Connected CH turns on or flashes)



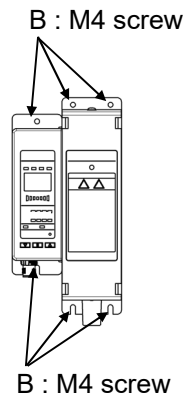
Direct connection
IZTC45+IZTP41-L+IZTB44 (4pcs.)



Separate connection
IZTC45+IZTP41-L+IZTB44 (4pcs.)

3-1-4. Installing the controller and high voltage power supply module

- The controller and high-voltage power supply module can be installed B part with screws. The screws should be prepared by the user. Fixed part thickness of controller 1.5mm. Recommended mounting screw is M4x6.



IZTC45 and IZTP41-L are directly connected.

- They can be installed on a DIN rail using optional DIN rail mounting brackets.
- DIN rail mounting brackets are required for mounting the controller and high voltage power supply module.

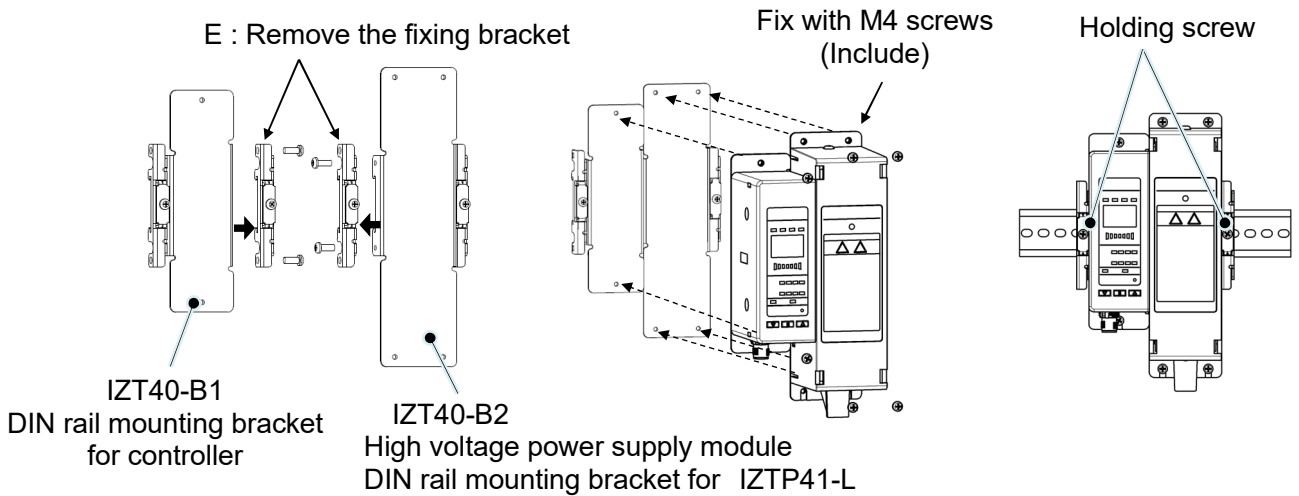
1) When the controller and high voltage power supply module are directly connected

- Remove the DIN rail mounting bracket fixing bracket part E.
- DIN rail mounting bracket
 - Fix the controller and high voltage power supply module to the DIN rail mounting bracket using M4 screws.

Tightening Torque: 1.30 to 1.50 Nm

- Install to the DIN rail.
 - After installing the DIN rail mounting bracket, fix the controller and high voltage power supply module to the DIN rail using M4 screws.

Tightening Torque: 1.30 to 1.50 Nm



2) When the controller and high voltage power supply module are connected by separate cable

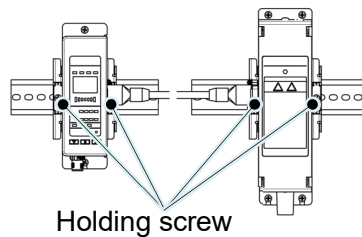
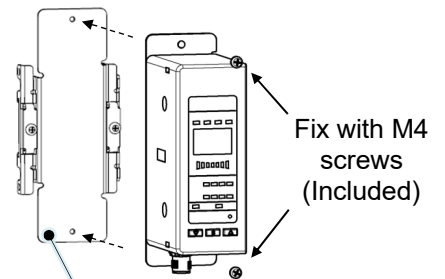
- Mount the spacers to the high voltage power supply module connector. Refer to 3-1-4. Connect the controller and high voltage power supply module.

- a. DIN rail mounting bracket
- Fix the DIN rail mounting bracket to the controller and high voltage power supply module using M4 screws.

Tightening Torque: 1.30 to 1.50 Nm

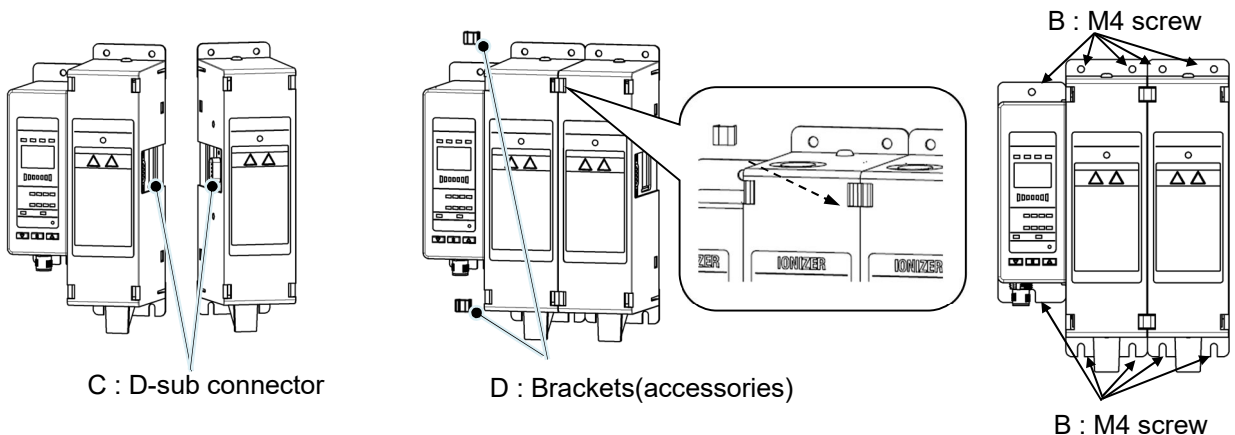
- b. Install to the DIN rail.
- After installing the DIN rail mounting bracket, fix the bracket to the DIN rail using M4 screws.

Tightening Torque: 1.30 to 1.50 Nm



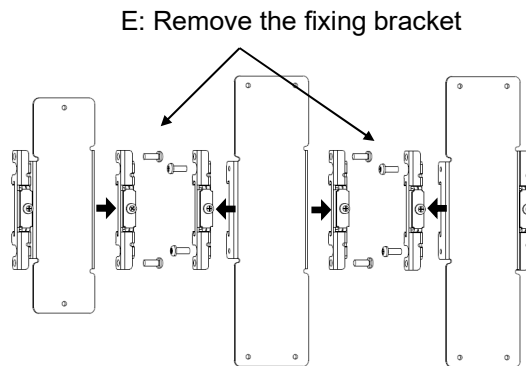
3-1-5. Adding a high voltage power supply module

- 1) High voltage power supply module to be added should be
 - a. Connected by D-sub connector at C part.
 - b. Mount the brackets to D part.
 - c. For installation of the controller and high voltage power supply module, fasten part B with M4 screws.
 - d. Set the CH number so that it does not duplicate the set number of other channels. If duplicated, it will be verified as an error. Refer to "4-3. High voltage power supply module CH number setting", "4-5. Alarm function" for further details.



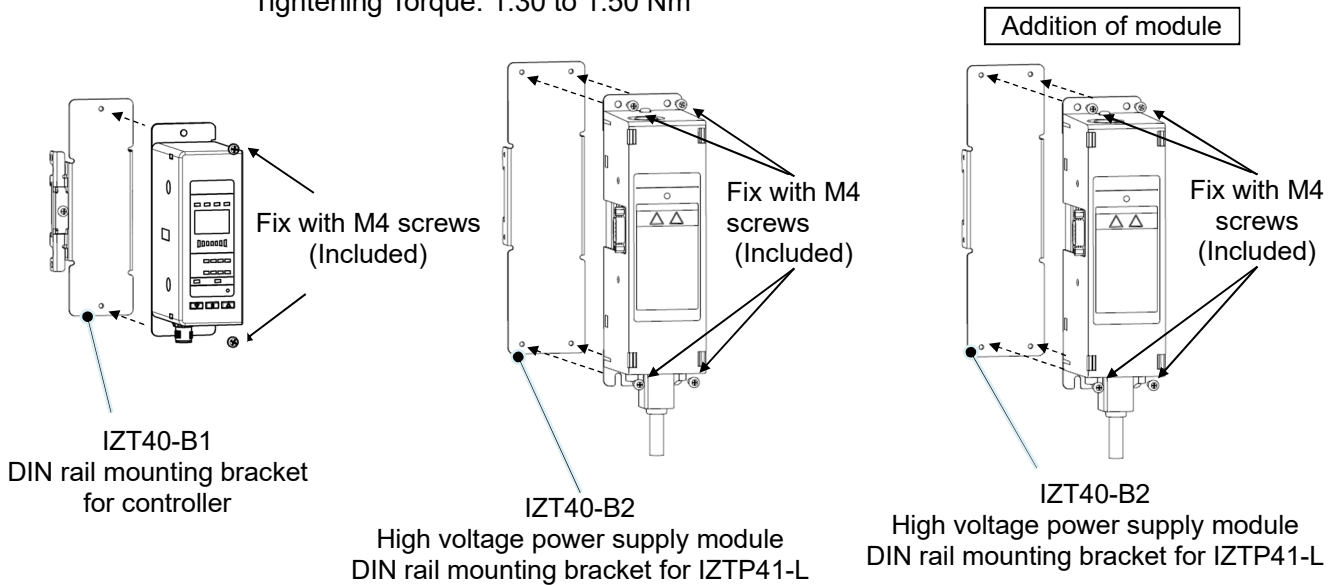
2) DIN rail installation for expansion

- a. Remove the fixing bracket from the DIN rail mounting bracket at the adjoining faces indicated at part E.



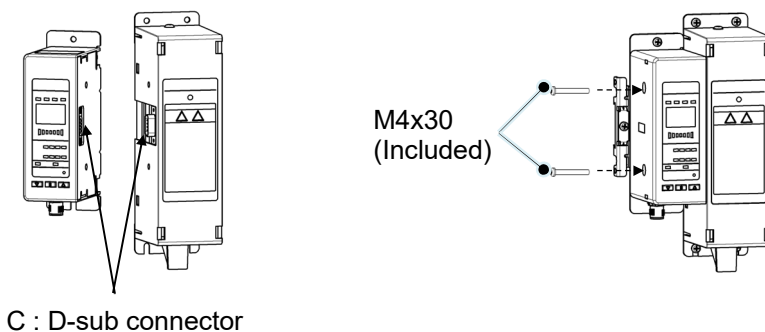
- b. Fix the controller and high voltage power supply module to the DIN rail mounting bracket using M4 screws.

Tightening Torque: 1.30 to 1.50 Nm

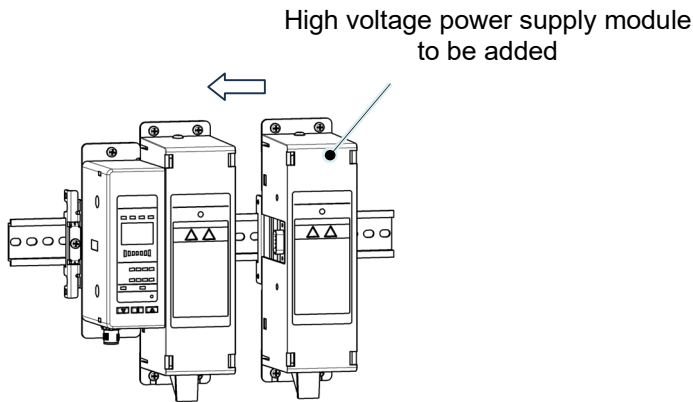


- c. Connect the D-sub connector in part C and fix the controller and high voltage module together using M4x30 screws (2 pcs. included as an accessory).

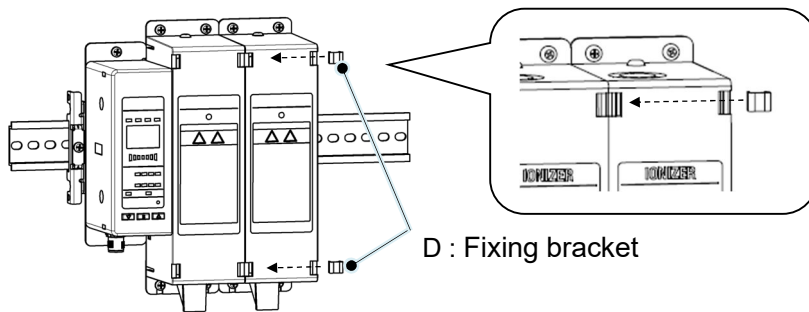
Tightening Torque: 0.22 to 0.24 Nm



- d. Mount them on to the DIN rail and connect the additional high voltage power supply module D-sub connector.



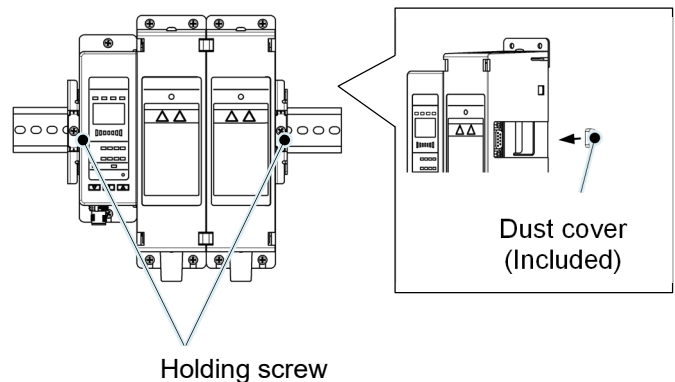
- e. Mount the fixing brackets (included as an accessory) in part D.



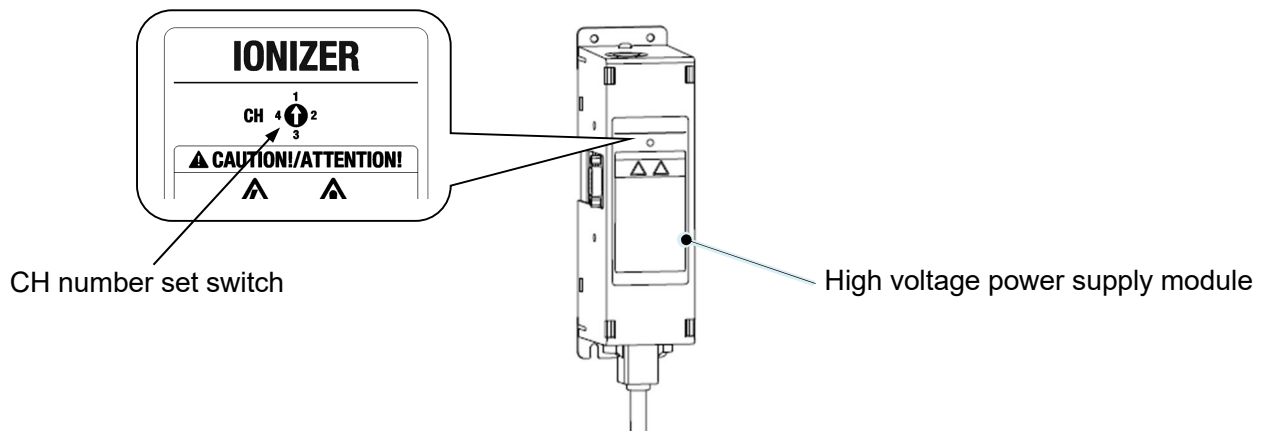
D : Fixing bracket

- f. After installing to the DIN rail, fix the bracket using set screws.

Tightening Torque: 1.30 to 1.50 Nm



- g. High voltage power supply module CH number setting
- Set the CH number setting switch for all connected high voltage power supply modules.
 - Set the CH number so that it does not duplicate the set number of other channels. If duplicated, it is verified as an error and displayed in the controller. Refer to “4-3. High voltage power supply module CH number setting.”, Refer to “4-5. Alarm function.”



3-1-6. Routing of cables

- Do not apply excess stress to the mounting part of the connector.
- When the cable is bent, maintain the minimum bend radius.

Minimum bending radius Power supply cable : 40mm
 Separate cable: 40 mm
 High voltage cable: 30mm

1) Power supply cable

- This cable supplies power to this product and external equipment used to control this product.
- When removing the power supply cable, pull it out straight. If mounted or removed in an inappropriate direction, the connector may be damaged and cause operation failure.
- Fix the cable around the connecting part so that stress is not applied to the connector.
- Connect the lead wires according to the wiring diagram. Unused wires should be cut short, or insulated using insulation tape.
- To satisfy the current capacity, make sure to wire 2 brown cable and brown-white cable in which a voltage of 24 VDC is supplied and blue cable and blue-white cable in which 0V is connected.

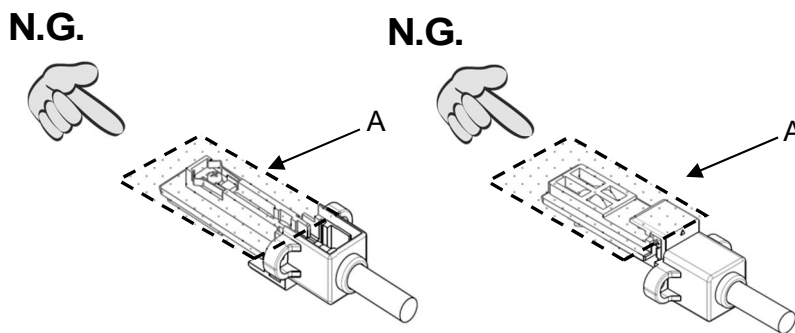
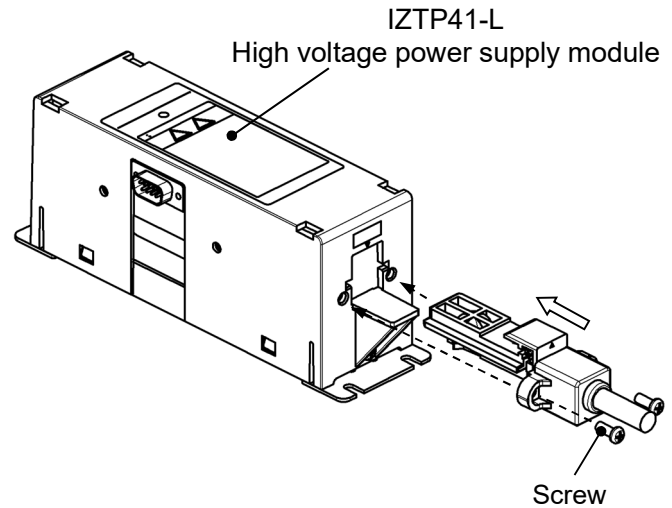
2) Separate cable (optional)

- Cable for connecting the controller and high voltage power supply module and connecting extension modules separately. This cable is not necessary when the modules are directly connected.
- Before connecting the cable, mount the spacers (included) in the male side of the D-sub connector plug on the high voltage power supply module. Refer to "3-1-6. Connect the controller and high voltage power supply module".
- It is not necessary to mount spacers to the controller D-sub connector and the D-sub connector (socket) of the high voltage power supply module because spacers are already mounted to them.
- When the separate cable is mounted or removed, pinch the connector with fingers and insert or take out the plug vertically. If mounted or removed in an inappropriate direction, the connector may be damaged and cause operation failure.
- After connecting the separate cable, fix screws of the connector. Mount the dust cover to any D-sub connector (socket) which is not used.

3) High voltage cable

- Connect the high voltage cable to the IZT41-L High voltage power supply module.
- When connecting and disconnecting the high voltage cable, hold the plugs together with the plug bodies, and insert or pull out straight. If mounted or removed in an inappropriate direction, the mounting part of the modular jack may be damaged and cause operation failure.
- Do not touch part A when handling the plug. Be careful so that moisture oil or foreign matter does not adhere to the plug. Adhesion of moisture, oil or foreign matter on part A may cause high voltage electric leakage. If they adheres to part A, clean it with ethanol.
- After connecting the high voltage cable to the controller, fix the cable using 2 cross recessed pan head screws (M4x10) included with the product.

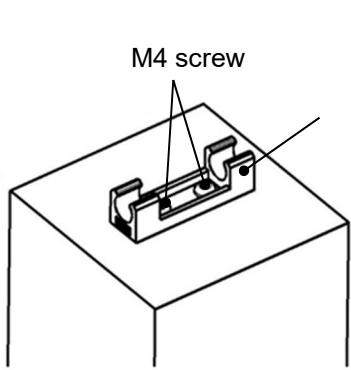
Tightening Torque: 0.49 to 0.53 Nm



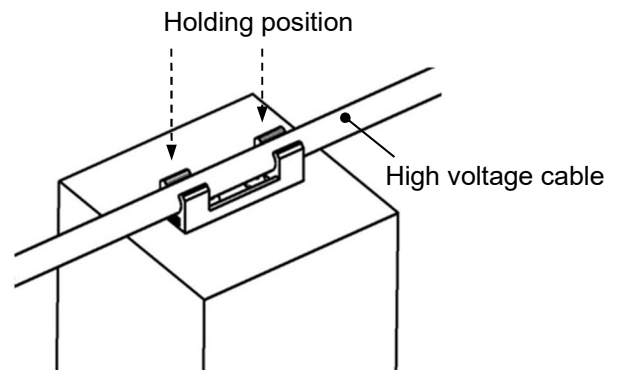
High voltage connector

- When installing the high voltage cable, use the specified high voltage cable holder.
- For installation of the High voltage cable holder (straight), use 2 cross recessed pan head screws. (The screws should be prepared by the user. Fixed part thickness 1.6mm, Recommended mounting screw is cross recessed pan head screw M4x6)
- For installation of the High voltage cable holder (elbow), use 3 cross recessed pan head screws. (The screws should be prepared by the user. Fixed part thickness of holder 3.8mm, Recommended mounting screw is cross recessed pan head screw M4x8)
- When they are used in layers, select the screw length considering the thickness of the high voltage cable holder (14.8 mm/holder).
- When holding the high voltage cable to the cable holder, align the cable in the holding position and mount it by pressing the cable.

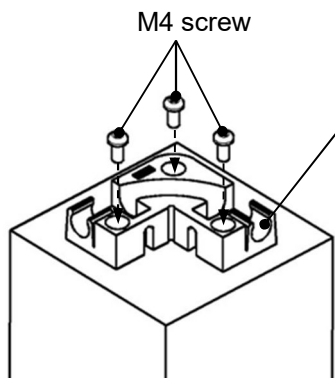
Tightening torque: 0.19 to 0.21 Nm



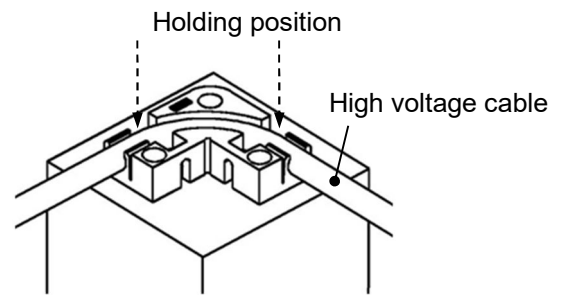
IZT40-E1
High voltage
cable holder
(straight)



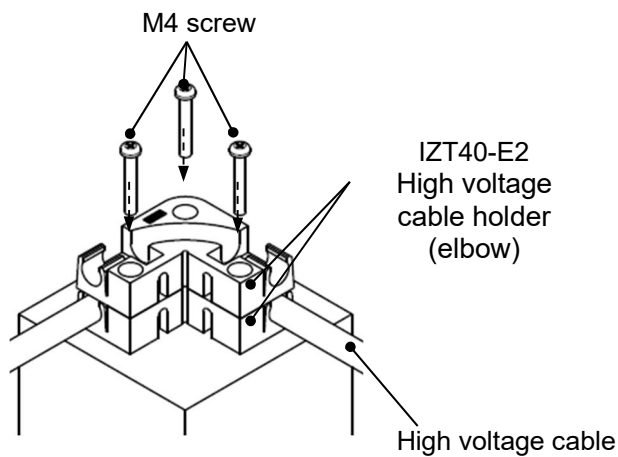
Installation example 1



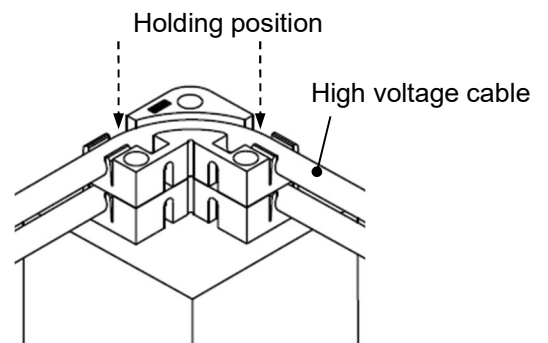
IZT40-E2
High voltage
cable holder
(elbow)



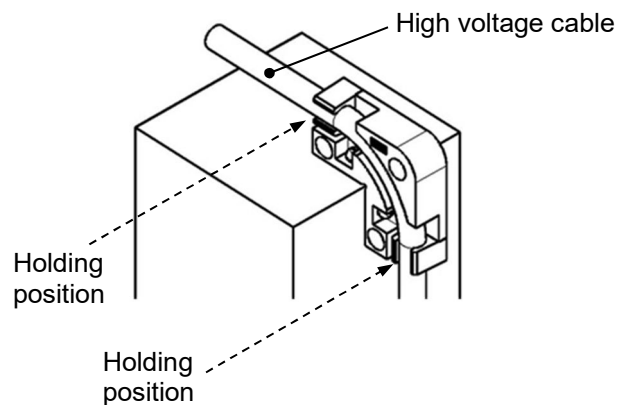
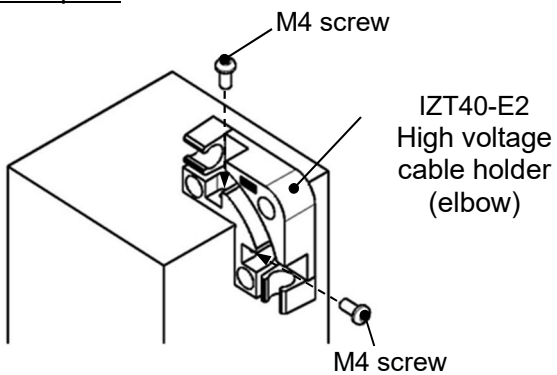
Installation example 2



IZT40-E2
High voltage
cable holder
(elbow)



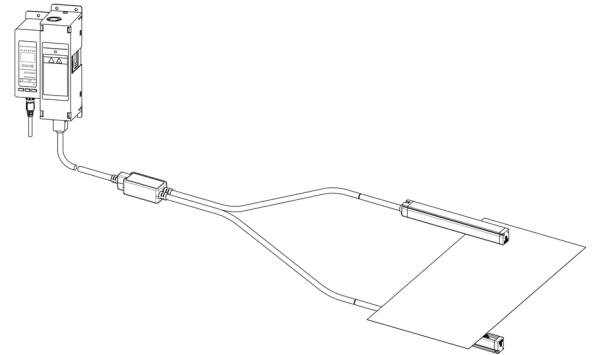
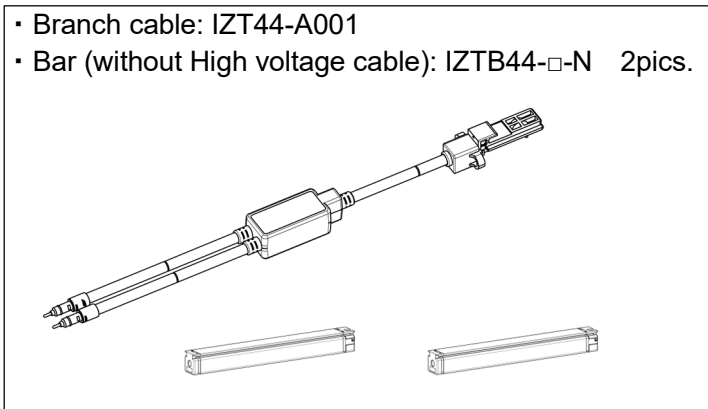
Installation example 3



3-1-7. Bar branch wiring

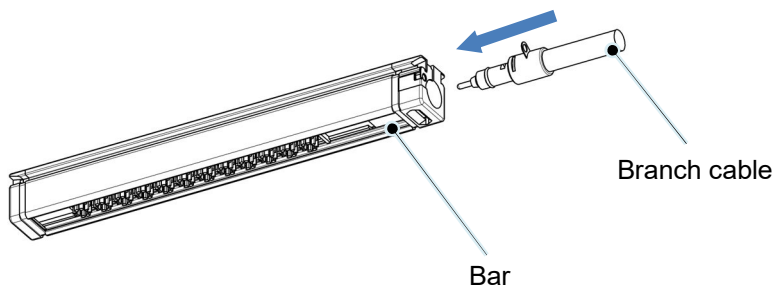
- By using branch cables, two bars can be connected to one high voltage power supply module.
- When using this product, please select the following combination.

- Branch cable: IZT44-A001
- Bar (without High voltage cable): IZTB44-□-N 2pics.

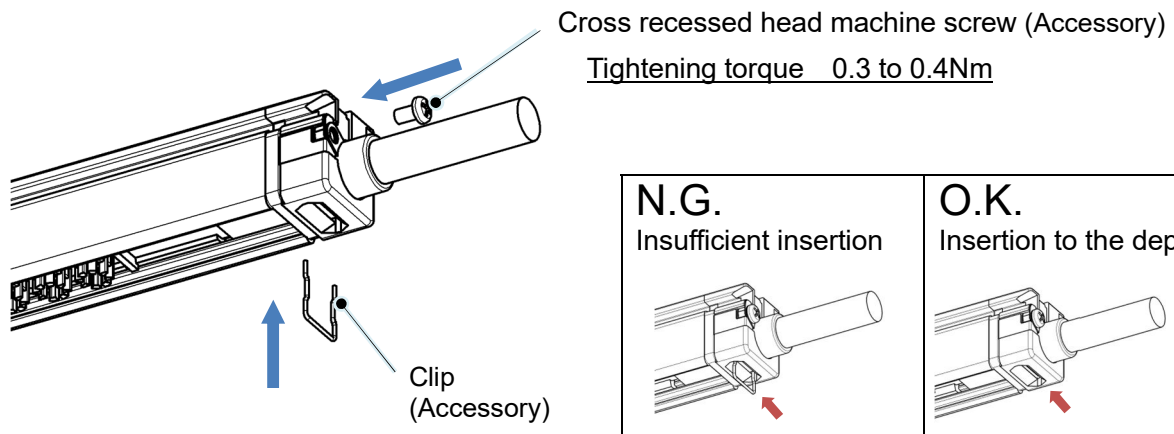


Assembly procedure

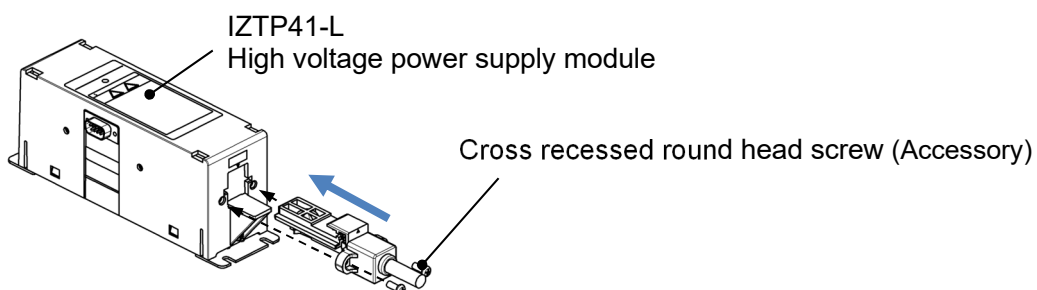
(1) Insert the branch cable into each bar.



(2) Fasten with clip and screw. Insert the clip firmly all the way to the back to prevent it from falling out.



(3) Install the bar and insert the branch cable into the controller and fix it with screw.



3-2. Electrical connection

- Wire power cables according to the wiring diagram and table.
- Do not apply excess stress to the mounting part of the controller connector.
- When the power supply cable is bent, maintain the minimum bend radius. Minimum bend radius: 40 mm
- Unused wires should be cut short, or protection using insulation tape.
- To satisfy the current capacity, make sure to 2 cables “brown and brown-white” in which a voltage of 24 VDC is supplied and 2 cables “blue and blue-white” in which 0V is connected.

3-2-1. Ground the F.G. cable

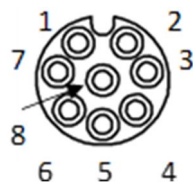
- Make sure to ground the F.G. cable with a ground resistance of 100Ω or less.
- The F.G. cable is used as a reference electric potential for static neutralization (Functional earth). If the F.G. cable is not grounded, an optimal ion balance cannot be obtained, and it may damage this product and power supply.

3-2-2. Grounding at DC mode

- When an ionizer is used in DC mode, make sure to ground the F.G. cable (green) and DC(-) cable (blue) of the input power supply with a resistance of 100 ohms or less. Without grounding the DC(-) cable, the ionizers and/or power supply may be damaged.

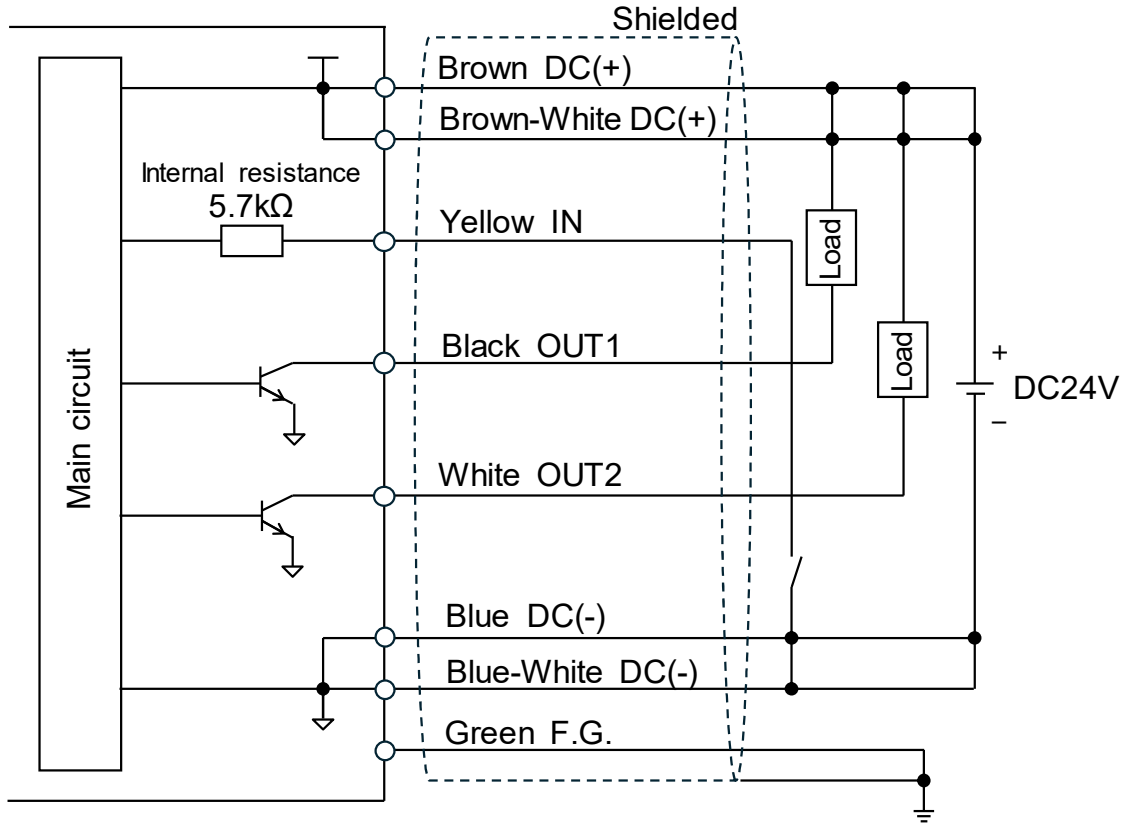
Table3. IZT45 Wiring table (NPN / PNP selectable at the touch of a button)

No.	Cable color	Signal	Description
1	Brown	DC(+)	Connect the power supply to operate the ionizer.
2	Brown-White		
3	Blue	DC(-)	
4	Blue-White		
5	Green	F.G.	Frame ground.
6	Yellow	IN	Signal input to turn ON/OFF ion generation.
7	Black	OUT1 (A contact)	Maintenance detection signal. Turns ON when emitter needs cleaning.
8	White	OUT2 (B contact)	Error signal. Turns OFF when there is problem.

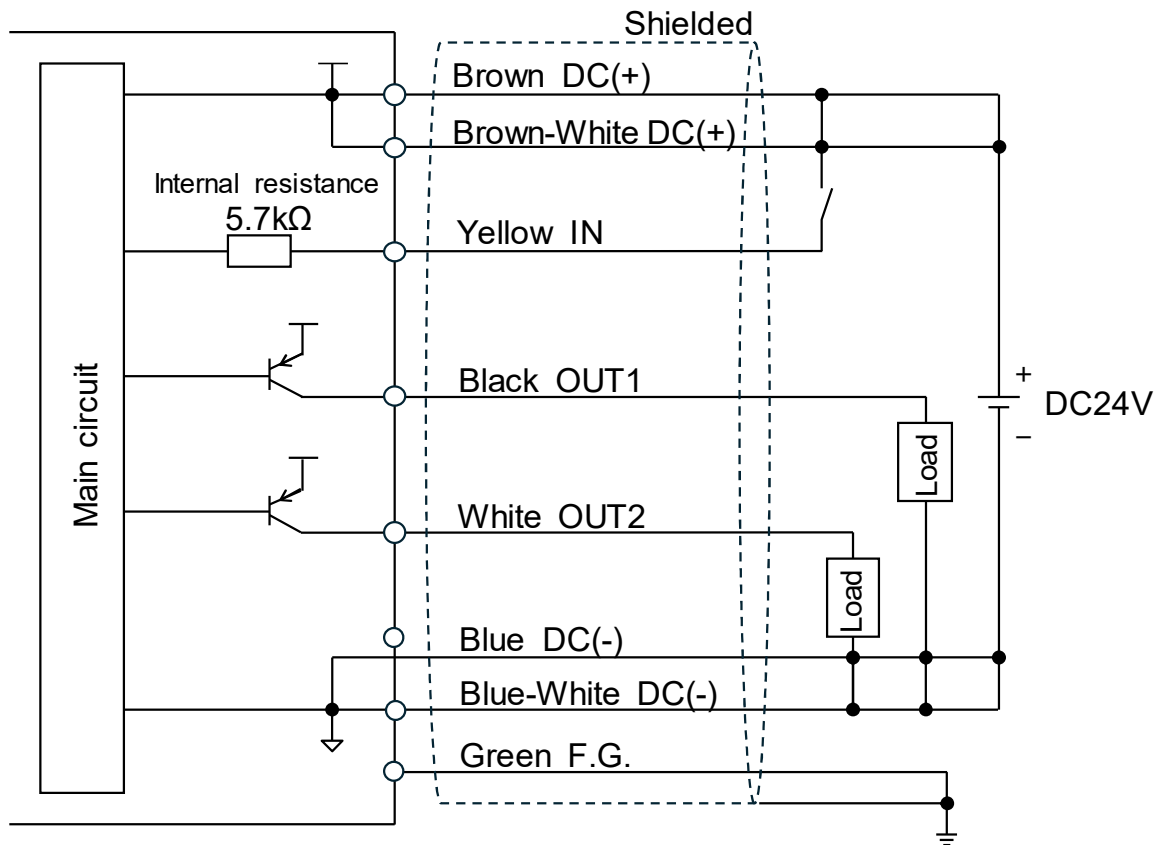


Socket
A-coded
(Normal key)

NPN setting



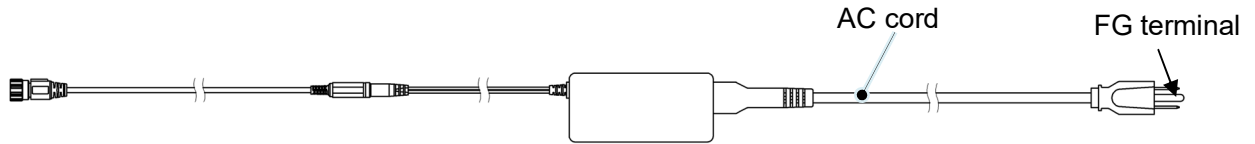
NPN setting



- Make sure to ground the F.G. cable (green) with a resistance of 100 ohms or less. Without grounding, this products and/or power supply may be damage.

3-2-3. Connecting of the AC adapter

- Perform F.G. wiring with the ground terminal (F.G.) of the AC cord when AC adapter is used. If the AC cord is plugged in, plug it into a grounded outlets with less than 100Ω. Use an AC cord with ground terminal, if it is prepared by the user.
- The ground terminal (F.G.) is used as a reference electric potential for static neutralization. If the ground terminal is not grounded, the Ionizer will not be able to achieve the optimal offset voltage (ion balance).
- When an AC adapter is used, the output signal cannot be used.

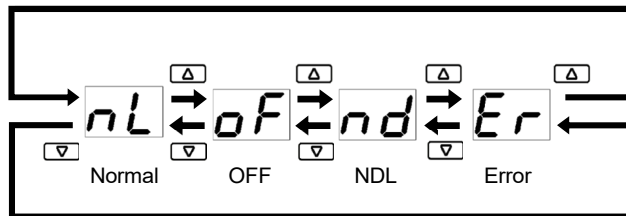
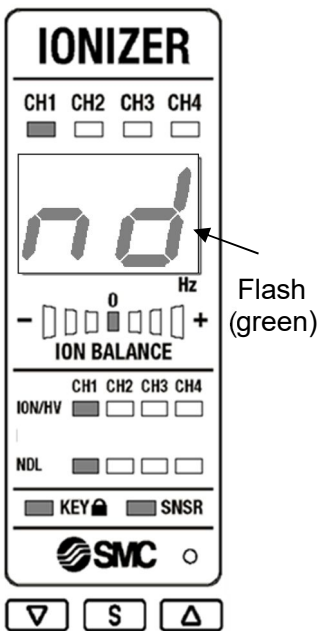


3-3. How to Check Output Signals

- This product allows to output signal to check the wiring and operation of an equipment.

[How to Check Output Signals]

- In the CH selection mode, press the ▲ and S buttons simultaneously for 2 seconds or longer to move to the balanced control selection mode.
- Pressing the S button 2 times in the balanced control selection mode displays “nL” in the frequency display, be able to check the output signal.
- Pressing the ▼ or ▲ button selects output stop, maintenance detection signal output, or error signal output as shown below. Refer to “3-4. Timing chart”.



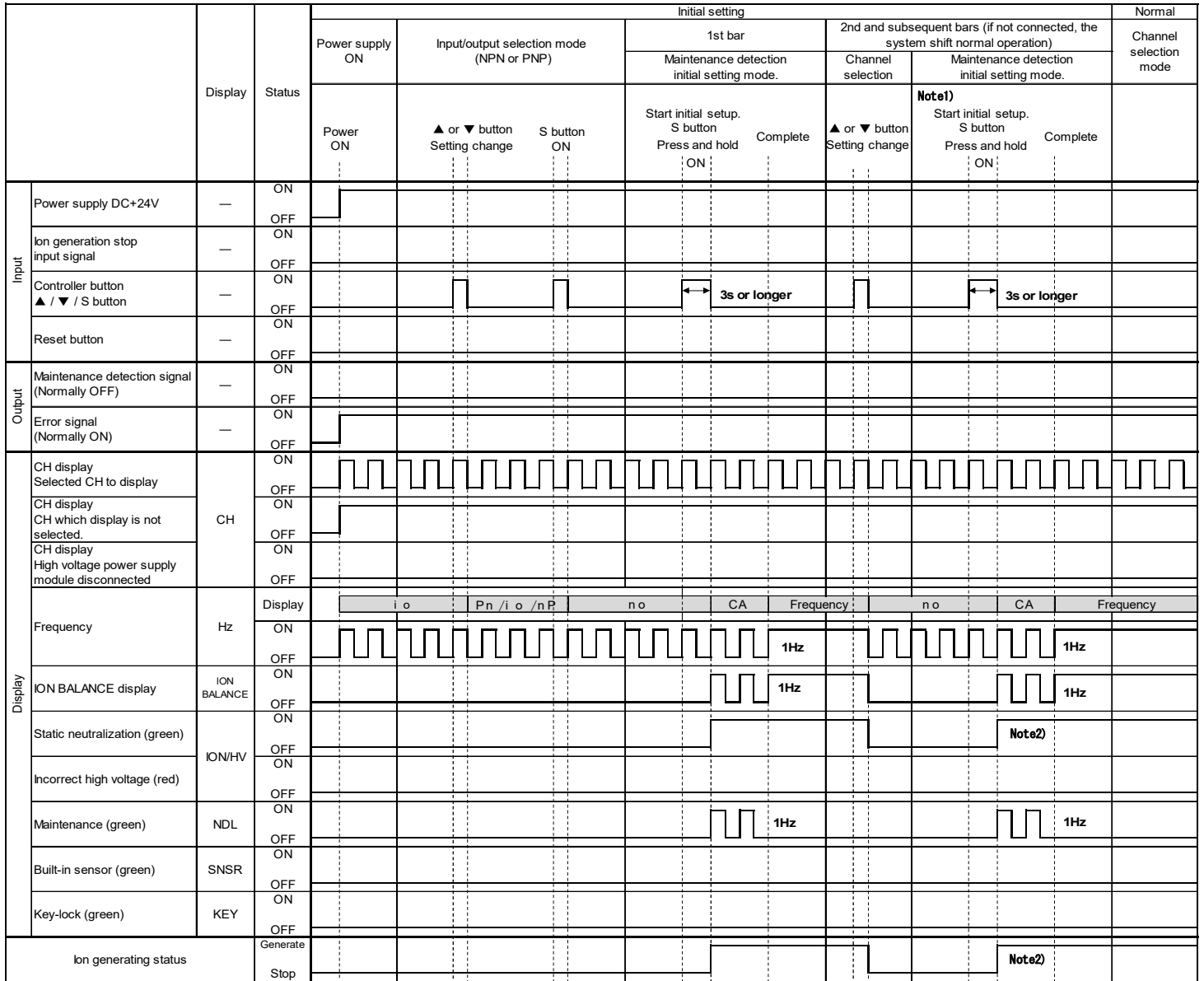
- nL** : Operates in the state before moving to output check mode.
- of** : Maintenance detection signal is OFF and error signal is ON.
- Nd** : Maintenance detection signal is ON.
- Er** : Error signal is OFF.

[Change to the next mode]

- Pressing the S button once to change to the next mode and the output signals return to the state during normal operation.
- The selected bar (high voltage power supply module) moves on to the ion generation stop mode by pressing ▼ and ▲ button simultaneously for 2 s or longer and stops ion generation. To release, press the S button once or turn the power off and on again. Refer to “4-4-8. Ion generation stop mode”.

3-4. Timing chart

1) Initial setting



Note 1) Initial setup is required for each connected bar.

Note 2) During the initial setting, bars other than the selected CH are stopped ion generation and ION/HV are turned off. Ion generation resumes when initial setting is completed.

Initial setting (Resetting)

	Display	Status	Initial setting (Resetting)				Normal				
			Normal	Input/output selection mode (NPN or PNP)	Channel selection mode	Maintenance detection initial setting mode.					
				Reset button Press and hold ON	▲ or ▼ button Setting change	S button ON	CH selection. ▲ or ▼ button Setting change	Reset button ON	Start initial setup. S button Press and hold ON	Complete	
Input	Power supply DC+24V	—	ON								
	Ion generation stop input signal	—	OFF								
	Controller button ▲ / ▼ / S button	—	ON								
	Reset button	—	ON								
			OFF								
Output	Maintenance detection signal (Normally OFF)	—	ON								
	Error signal (Normally ON)	—	OFF								
			ON								
Display	CH display Selected CH to display	CH	ON								
	CH display CH which display is not selected.		OFF								
	CH display High voltage power supply module disconnected		ON								
			OFF								
	Frequency	Hz	Display	Frequency	Pn / i o / n P	Frequency	n o	CA	Frequency		
			ON								
			OFF								
	ION BALANCE display	ION BALANCE	ON								1Hz
			OFF								1Hz
	Static neutralization (green)	ION/HV	ON					Note3)	Note2)		
Incorrect high voltage (red)	OFF										
Maintenance (green)	NDL	ON								1Hz	
Built-in sensor (green)	SNSR	OFF									
Key-lock (green)		ON									
		OFF									
Ion generating status		Generate									
		Stop						Note3)	Note2)		

Note 2) During the initial setting, bars other than the selected CH are stopped ion generation and ION/HV are turned off. Ion generation resumes when initial setting is completed.

Note 3) Selected CH ION/HV to display is turned off and stop ion generation.

2) Normal operation

		Normal operation			
		Power ON/OFF	Ion generation stop input signal	Ion generation stop operation button	
		Power ON OFF ON	Input signal ON OFF	Ion generation stop. ▲+▼ button ON Press and hold	Ion generation stop release. S button ON
		ON	OFF	ON	ON
Input	Power supply DC+24V	—	ON		
	Ion generation stop input signal	—	ON		Note5
	Controller button ▲ / ▼ / S button	—	ON		2s or longer
Output	Maintenance detection signal (Normally OFF)	—	ON		
	Error signal (Normally ON)	—	ON		
Display	CH display Selected CH to display	CH	ON		
	CH display CH which display is not selected.		OFF		
	CH display CH display High voltage power supply module disconnected		ON		
	Frequency	Hz	ON		1Hz Note6
	ION BALANCE display	ION BALANCE	ON		
			OFF		
	Static neutralization (green)	ION/HV	ON	Note7	Note9
	Incorrect high voltage (red)		OFF		
	Maintenance (green)	NDL	ON		
	Built-in sensor (green)		SNSR	ON	
	Key-lock (green)	KEY	ON		
			OFF		
	Ion generating status		Generate		Note8
		Stop			

Note 4) It takes 3 seconds to operate after the power is on.

Note 5) The button operation and the external input signal take priority over the one executed first, and the other's stop instruction becomes invalid.
To release by the button, press the S button once or turn the power off and on again.

Note 6) 5 P flashes.

Note 7) All connected CH ION/HV to display is turned off.

Note 8) All the selected bars (high voltage power supply module) stop ion generation.

Note 9) Selected CH ION/HV to display is turned off.

Note 10) Selected bar (high voltage power supply module) stops the ion generation.

			Normal operation						
			Ion generation stop (button operation) is canceled by turning the power on again.			Ion generation stop. Both button operation and input signal.			
			Ion generation stop. ▲+▼button Press and hold ON	Turning the power on again. Stop release. Power OFF	Power ON	Ion generation stop. ▲+▼button Press and hold ON	Ion generation stop. Input signal ON	Ion generation stop release. S button ON	Ion generation stop release. Input signal OFF
Input	Power supply DC+24V	—	ON						
	Ion generation stop input signal	—	OFF						
	Controller button ▲ / ▼ / S button	—	ON						
Output	Maintenance detection signal (Normally OFF)	—	ON						
	Error signal (Normally ON)	—	OFF						
Display	CH display Selected CH to display	CH	ON						
	CH display CH which display is not selected.		OFF						
	CH display High voltage power supply module disconnected	Hz	ON						
	Frequency		OFF						
	ION BALANCE display	ION BALANCE	ON						
	Static neutralization (green)	ION/HV	ON						
	Incorrect high voltage (red)		OFF						
	Maintenance (green)	NDL	ON						
	Built-in sensor (green)	SNSR	ON						
	Key-lock (green)		OFF						
Ion generating status			Generate						
			Stop						

Note 5) The button operation and the external input signal take priority over the one executed first, and the other's stop instruction becomes invalid. To release by the button, press the S button once or turn the power off and on again.

Note 6) 5 P flashes.

Note 7) All connected CH ION/HV to display is turned off.

Note 8) All the selected bars (high voltage power supply module) stop ion generation.

Note 9) Selected CH ION/HV to display is turned off.

Note 10) Selected bar (high voltage power supply module) stops the ion generation.

3) Setting mode

		Display	Status	Setting mode						
				Channel selection mode	Frequency set mode		Offset voltage adjustment mode		Channel selection mode	
				CH selection. ▲ or ▼ button Setting change	S button ON	CH selection. ▲ or ▼ button Setting change	S button ON	Offset voltage adjustment ▲ or ▼ button Setting change	S button ON	
Input	Power supply DC+24V	—	ON							
			OFF							
	Ion generation stop input signal	—	ON							
			OFF							
Controller button ▲ / ▼ / S button		—	ON							
			OFF							
Output	Maintenance detection signal (Normally OFF)	—	ON							
			OFF							
	Error signal (Normally ON)	—	ON							
			OFF							
Display	CH display Selected CH to display	CH	ON							
			OFF							
	CH display CH which display is not selected.		ON							
			OFF							
	CH display High voltage power supply module disconnected		ON							
			OFF							
	Frequency	Hz	ON							1Hz Note11)
			OFF							
	ION BALANCE display	ION BALANCE	ON							1Hz
			OFF							
	Static neutralization (green)	ION/HV	ON							
			OFF							
	Incorrect high voltage (red)		ON							
			OFF							
Maintenance (green)	NDL	ON								
		OFF								
Built-in sensor (green)	SNSR	ON								
		OFF								
Key-lock (green)	KEY	ON								
		OFF								
Ion generating status		Generate								
		Stop								

Note 11) Content of each setting mode is displayed by flashing. Refer to [4-4. Controller setting].

	Display	Status	Setting mode																	
			Channel selection	Balance control selection mode			Maintenance detection level selection mode		Output check mode			Channel selection								
				▲ +S button Press and hold ON	Balance control selection ▲ or ▼ button ON OFF	S button ON	▲ or ▼ button Setting change	S button ON	Setting change. Maintenance detection signal output	Output check selection. ▲ or ▼ button Setting change. Error signal output	Setting change. Normal operation. S button ON									
Input	Power supply DC+24V	—	ON																	
	Ion generation stop input signal	—	OFF																	
	Controller button ▲ / ▼ / S button	—	ON																	
		—	OFF																	
Output	Maintenance detection signal (Normally OFF)	—	ON																	
	Error signal (Normally ON)	—	OFF																	
		—	ON																	
Display	CH display Selected CH to display	CH	ON																	
	CH display CH which display is not selected.		OFF																	
	CH display High voltage power supply module disconnected		ON																	
			OFF																	
	Frequency	Hz	ON																	
			OFF																	
	ION BALANCE display	ION BALANCE	ON																	
	Static neutralization (green)	ION/HV	ON																	
	Incorrect high voltage (red)		OFF																	
			ON																	
Maintenance (green)	NDL	ON																		
		OFF																		
Built-in sensor (green) Note12	SNSR	ON																		
		OFF																		
Key-lock (green)	KEY	ON																		
		OFF																		
Ion generating status		Generate																		
		Stop																		

- Note 11) Content of each setting mode is displayed by flashing. Refer to [4-4. Controller setting].
 Note 12) When a branch cable is connected, the built-in sensor is turned off and the display does not light up.
 Note 13) The abnormal state is canceled and the output goes to the normal state.
 Note 14) Returns to the output state before shifting to the output check mode.
 Note 15) The contents of each setting are displayed. Refer to [3-3. How to Check Output Signals] for the displayed contents.

			Setting mode								
			Key-lock setting mode								
			Key-lock setting S button Press and hold ON	▲ or ▼ button Setting change	S button ON	Power supply OFF	ON	Key-unlock S button Press and hold ON	▲ or ▼ button Setting change	S button ON	
	Display	Status									
Input	Power supply DC+24V	—	ON								
	Ion generation stop input signal	—	OFF								
	Controller button ▲ / ▼ / S button	—	ON								
Output	Maintenance detection signal (Normally OFF)	—	ON								
	Error signal (Normally ON)	—	OFF								
Display	CH display Selected CH to display	CH	ON								
	CH display CH which display is not selected.		OFF								
	CH display High voltage power supply module disconnected		ON								
			OFF								
	Frequency	Hz	ON								
	ION BALANCE display	ION BALANCE	ON								
	Static neutralization (green)	ION/HV	OFF								
	Incorrect high voltage (red)		ON								
			OFF								
	Maintenance (green)	NDL	ON								
Built-in sensor (green)	SNSR	ON									
Key-lock (green)	KEY	ON									
		OFF									
Ion generating status		Generate									
		Stop									

Note 11) Content of each setting mode is displayed by flashing. Refer to [4-4. Controller setting].

Note 16) If ON is selected for key lock setting, the setting is held even if the power is turned off and on again.

4) In case of error or warning

	Display	Status	Abnormality of the CPU (Controller) Error code: E0	Abnormality of the power supply Error code: E1	Abnormality of the CPU (High voltage power supply module) Error code: E2	Abnormality of the High voltage Error code: E3	
			Power supply OFF ON Error	Power supply OFF ON Error	Power supply OFF ON Error	Power supply OFF ON Error Note17)	
Input	Power supply DC+24V	—	ON				
		—	OFF				
	Ion generation stop input signal	—	ON				
	Controller button ▲ / ▼ / S button	—	ON				
		—	OFF				
Output	Maintenance detection signal (Normally OFF)	—	ON				
		—	OFF				
	Error signal (Normally ON)	—	ON				
		—	OFF				
Display	CH display Selected CH to display	CH	ON	1Hz	1Hz	1Hz	1Hz
			OFF				
	CH display CH which display is not selected.		ON				
			OFF				
	CH display High voltage power supply module disconnected	ON					
		OFF					
	Frequency	Hz	ON	1Hz Note18)	1Hz Note18)	1Hz Note19)	1Hz Note19)
		—	OFF				
	ION BALANCE display	ION BALANCE	ON			Note20)	Note20)
		—	OFF				
	Static neutralization (green)	ION/HV	ON				
			OFF				
Incorrect high voltage (red)	ON	1Hz Note22)	1Hz Note23)	1Hz Note24)	Note25)		
	OFF						
Maintenance (green)	NDL	ON			Note26)	Note26)	
	OFF						
Built-in sensor (green)	SNSR	ON		Note27)	Note27)	Note27)	
	OFF						
Key-lock (green)	KEY	ON	Note27)	Note27)	Note27)	Note27)	
	OFF						
Ion generating status	Generate		Note28)	Note28)	Note29)	Note29)	
	Stop						

Note17) Abnormality can also be released by the ion generation stop signal. Release the error after resolving the cause of the abnormality.

Note18) Frequency with problem is displayed by flashing error code. Refer to [4-5. Alarm function].

Note19) Frequency of the high voltage power supply module with a problem is displayed by flashing error code. Refer to [4-5. Alarm function].

High voltage power supply module without problem indicates normal status.

Note20) High voltage power supply module without problem indicates normal status.

Note22) All ION/ HV of CH1 to 4 flash (red).

Note23) All connected high voltage power supply module ION/HV flash (red).

Note24) High voltage power supply module ION/HV with problem flashes (red).

Note25) High voltage power supply module ION/HV with problem turns on (red).

Note26) High voltage power supply module NDL with problem turns off.

Note27) The status at the time of problem holds the setting status.

Note28) All the selected bars (high voltage power supply module) stop the ion generation.

Note29) Bar with a problem (high voltage power supply module) stops the ion generation.

			Communication error Error code: E4	Abnormality of the cooling fan motor Error code: E5	Inconsistent module Error code: E6	Duplication of CH Error code: E7	
	Display	Status	Power supply OFF ON				
			Error	Note17	Error	Note17	Error
Input	Power supply DC+24V	—	ON				
	Ion generation stop input signal	—	OFF				
	Controller button ▲ / ▼ / S button	—	ON				
Output	Maintenance detection signal (Normally OFF)	—	OFF				
	Error signal (Normally ON)	—	ON				
Display	CH display Selected CH to display	CH	ON				
	CH display CH which display is not selected.		OFF				
	CH display High voltage power supply module disconnected		ON				
	Frequency		Hz	ON			
	ION BALANCE display	ION BALANCE	ON	Note20	Note20	Note20	Note20
	Static neutralization (green)	ION/HV	ON				
	Incorrect high voltage (red)		OFF				
	Maintenance (green)	NDL	ON	Note26	Note26	Note26	Note26
	Built-in sensor (green)	SNSR	ON	Note27	Note27	Note27	Note27
	Key-lock (green)	KEY	ON	Note27	Note27	Note27	Note27
	Ion generating status		Generate	Note29	Note29	Note29	Note29
			Stop	Note29	Note29	Note29	Note29

Note17) Abnormality can also be released by the ion generation stop signal. Release the error after resolving the cause of the abnormality.
Note19) Frequency of the high voltage power supply module with a problem is displayed by flashing error code. Refer to [4-5. Alarm function].
High voltage power supply module without problem indicates normal status.
Note20) High voltage power supply module without problem indicates normal status.
Note24) High voltage power supply module ION/HV with problem flashes (red).
Note26) High voltage power supply module NDL with problem turns off.
Note27) The status at the time of problem holds the setting status.
Note29) Bar with a problem (high voltage power supply module) stops the ion generation.

		Display	Status	Output signal over current Error code: E8 (Error signal) Error code: E9 (Maintenance signal)	High voltage power supply module not connected Error code: - -	Maintenance warning
				Error	Error	Warning
				Power supply OFF ON	Power supply OFF ON	Note17
Input	Power supply DC+24V	—	ON			
		—	OFF			
	Ion generation stop input signal	—	ON			
		—	OFF			
	Controller button ▲ / ▼ / S button	—	ON			
Output	Maintenance detection signal (Normally OFF)	—	ON			
		—	OFF			
		—	ON			
	Error signal (Normally ON)	—	OFF			
Display	CH display Selected CH to display	CH	ON	1Hz	1Hz	1Hz
			OFF			
	CH display CH which display is not selected.		ON			
			OFF			
	CH display High voltage power supply module disconnected	ON				
		OFF				
	Frequency	Hz	ON	1Hz Note18	1Hz Note18	
			OFF			
	ION BALANCE display	ION BALANCE	ON			
			OFF			
	Static neutralization (green)	ION/HV	ON	1Hz Note21		
			OFF			
Incorrect high voltage (red)		ON				
		OFF				
Maintenance (green)	NDL	ON	Note27			
		OFF				
Built-in sensor (green)	SNSR	ON	Note27		Note27	
		OFF				
Key-lock (green)	KEY	ON	Note27	Note27	Note27	
		OFF				
Ion generating status			Generate			
			Stop			

Note17) Abnormality can also be released by the ion generation stop signal. Release the error after resolving the cause of the abnormality.

Note18) Frequency with problem is displayed by flashing error code. Refer to [4-5. Alarm function].

Note21) All connected high voltage power supply module ION/HV flash (green).

Note27) The status at the time of problem holds the setting status.

4. Setting

4-1. Name of Parts

4-1-1. Controller

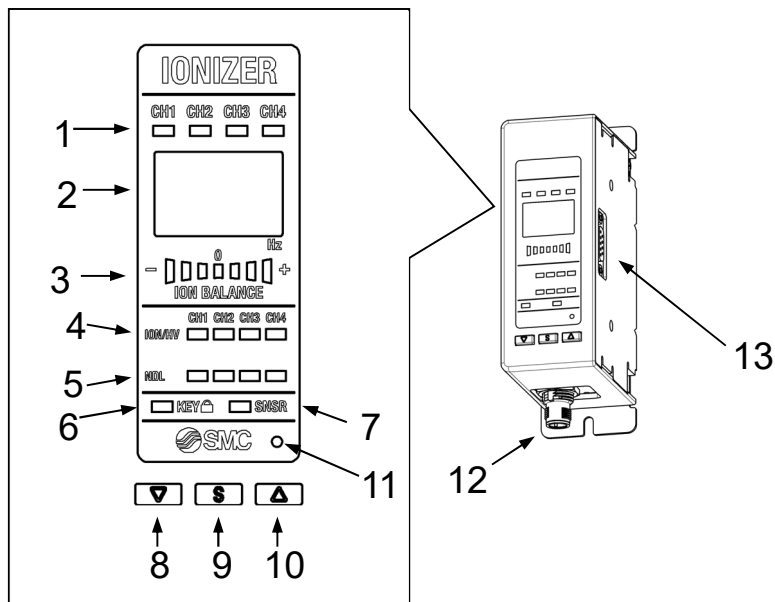


Table4. Name of controller IZTC45 parts

No.	Name	Indication	Type	Description
1	CH display	CH□	LED (Green)	LED of CH connected to the controller is ON (green), LED of the selected CH flashes (green).
2	Frequency display	Hz	LED (Green)	LED is ON(green) during operation. LED flashes (green) during setting and each abnormality.
3	Ion balance display	ION BALANCE	LED (Green/Orange)	LED (green) indicates the balance status by lighting up during operation. LED (green) flashes during offset voltage adjustment. LED (orange) flashes when ion balance is maximum or minimum during offset adjustment.
4	Ion emission/ High voltage error display	ION/HV	LED (Green / Red)	LED(green) is ON during static neutralization on each CH. LED(red) is ON or flashes when abnormality exists on each CH.
5	Maintenance display	NDL	LED (Green)	LED (green) is ON when emitter contamination is detected on each CH.
6	Key-lock display	KEY	LED (Green)	LED(green) is ON when Key lock is ON.
7	Sensor LED	SNSR	LED (Green)	LED(green) is ON (green) when Auto balance function is ON.
8	▼ button	—	Press button	Decrease the set value.
9	S button	—	Press button	Change the mode and set a set value.
10	▲ button	—	Press button	Increase the set value.
11	Reset button	—	Press button	Return the setting values of each mode to the default condition.
12	Power supply connector	—	M12 Connector	Connect the power cable.
13	High voltage power supply module connector	—	D-sub connector (socket)	Connect high voltage power supply module or separate cable.

4-1-2. High voltage power supply module

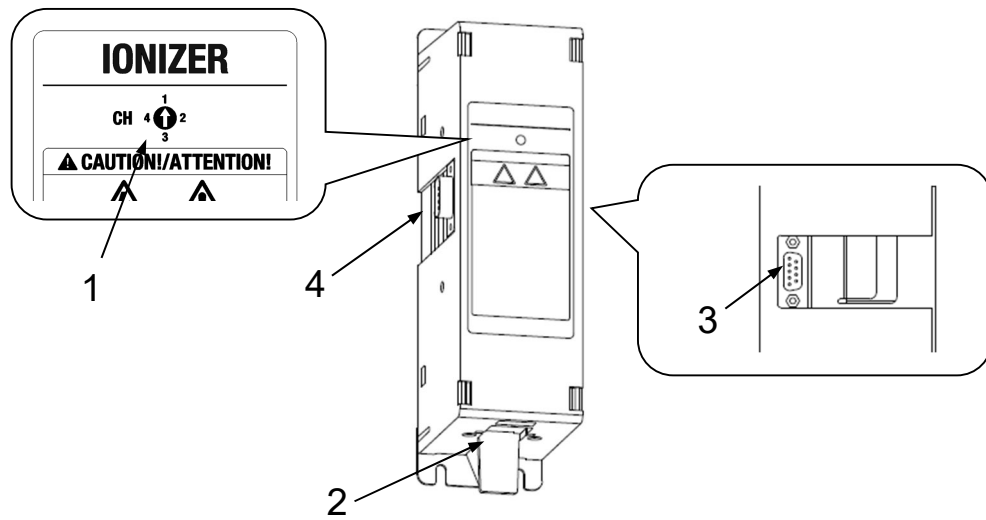


Table5. Name of High voltage power supply module IZTP41-L parts

No.	Name	Indication	Type	Description
1	CH number set switch	CH	Rotary switch	High voltage power supply module CH number setting.
2	High voltage cable connector	—	Connector	Connect with the high voltage connector.
3	High voltage power supply module connector	—	D-sub connector (socket)	Connect high voltage power supply module or separate cable.
4	Controller/ high voltage power supply module connector	—	D-sub connector (plug)	Connect the controller, high voltage power supply module or separate cable.

4-2. Operation modes

- The product has 2 operation modes. AC mode or DC mode (Either positive ions or negative ions are continuously discharged during operation).

1) AC mode

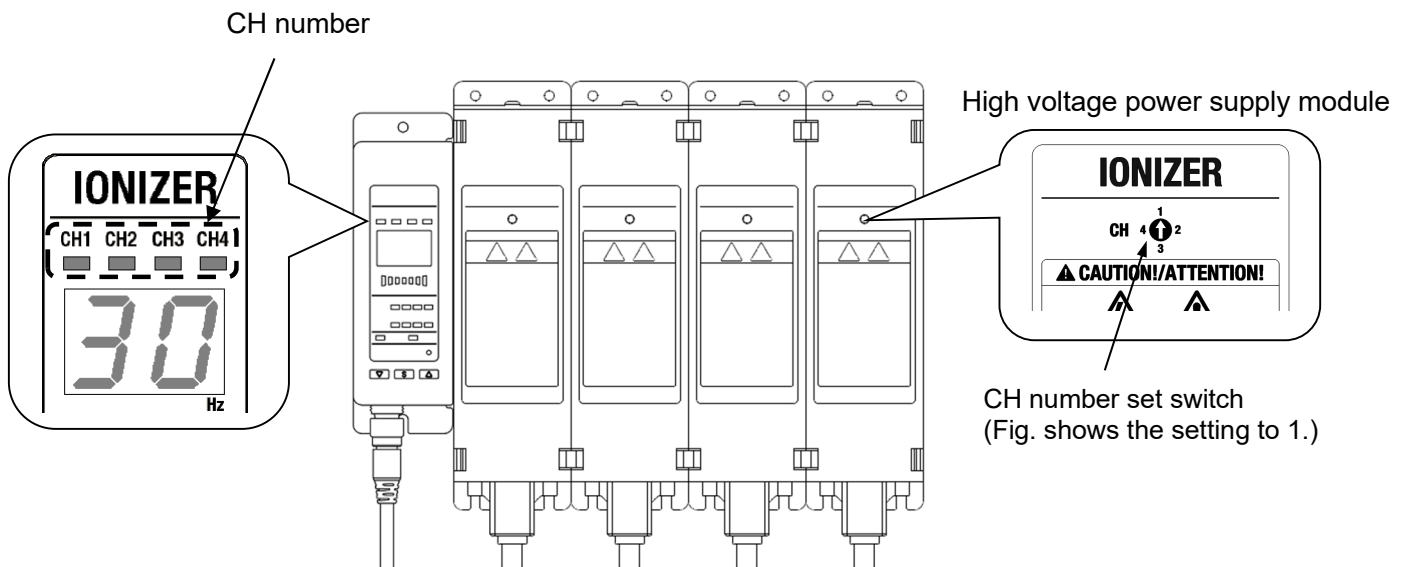
- Ions of different polarity are generated alternately according to the frequency set by the frequency set mode.
- If the offset voltage (ion balance) is displaced by the installation environment of the ionizer, adjust the offset voltage.
- Refer to “4-4-3. Frequency set mode” for frequency setting and “4-4-4. Offset voltage adjustment mode” for the adjustment of the offset voltage (ion balance).

2) DC mode

- Positive ions are generated when “dp” is set for the frequency mode. Negative ions are generated by setting “dn”.
- Refer to “4-4-3. Frequency set mode” for further details.

4-3. High voltage power supply module CH number setting

- When multiple high voltage power supply modules are connected to one controller, the CH number must be set for each high voltage power supply module.
- The CH number can be assigned from 1 to 4. (Up to 4 modules can be connected). Set the CH number set switch on the high voltage power supply module.
- The CH number set for the high voltage power supply module corresponds with the CH number displayed on the controller.
- The CH number must not be duplicated. Duplication of the CH number will generate an error (error code: E7).



4-4. Controller setting

4-4-1. Operation overview

Default condition
Frequency setting : 30Hz
Key lock : OFF
Built-in sensor : OFF
Maintenance detection level : MIDDLE

Power is supplied.



[Channel selection mode]

Select the CH number for setting and display. When multiple high voltage power supply modules are connected, switch the CH for setting and display. Refer to 4-4-2. Channel selection mode for details.



Press S button once



Press S button for 3 sec. or longer



Press the ▲ button and S button at the same time for 2 seconds or longer.

[Frequency set mode]

Set the ion generation frequency of the bar selected by "Channel selection mode". Refer to 4-4-3. Frequency set mode for details.

[Key-lock setting mode]

Perform a key-lock setting. Refer to 4-4-7. Key-lock set mode for details.

[Balance control selection mode]

Select ON/ OFF of the balance control by the sensor built in the high voltage power supply module selected in "Channel selection mode" Refer to 4-4-5. Balance control selection mode for details.



Press S button once



Press S button once

[Offset voltage adjustment mode]

Adjust the offset voltage of the bar selected by "CH selection mode". Refer to "4-4-4. Offset Voltage adjustment mode" for details.

[Maintenance detection level selection mode]

Set the contamination detection level of the high voltage power supply module emitter selected by "Channel selection mode". Refer to Maintenance detection level selection mode for details.



Press S button once



Press S button once



Press S button once



Press S button once

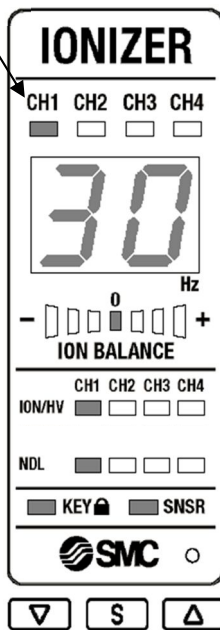
[Channel selection mode]

Note) In each setting mode, the selected bar moves on to the ion generation stop mode by pressing ▼ and ▲ button simultaneously for 2 s or longer and stops the ion generation. (Operation is not possible while the key lock is ON or externally input signal is ON). To release from stop, press the S button once or turn the power off and on again. Refer to "4-4-8. Ion generation stop mode" for further details.

4-4-2. Channel selection mode

- When power is supplied to the controller, the CH LED (green) of the connected bar (high voltage power supply module) turns on or flashes. A flashing CH LED indicates the selected CH of high voltage power supply module. The LED for frequency, ION BALANCE and SNSR display of the selected CH.
- The LED for ION/HV and NDL display all the information of the connected bar.
- The controller CH1 to CH4 LED's correspond to CH no. 1 to 4 set for the high voltage power supply modules.
- The maximum number of high voltage power supply modules for one controller is 4 pcs.
- Duplication of CH number of connected high voltage power supply modules will be recognized as an error.

Flash (green)



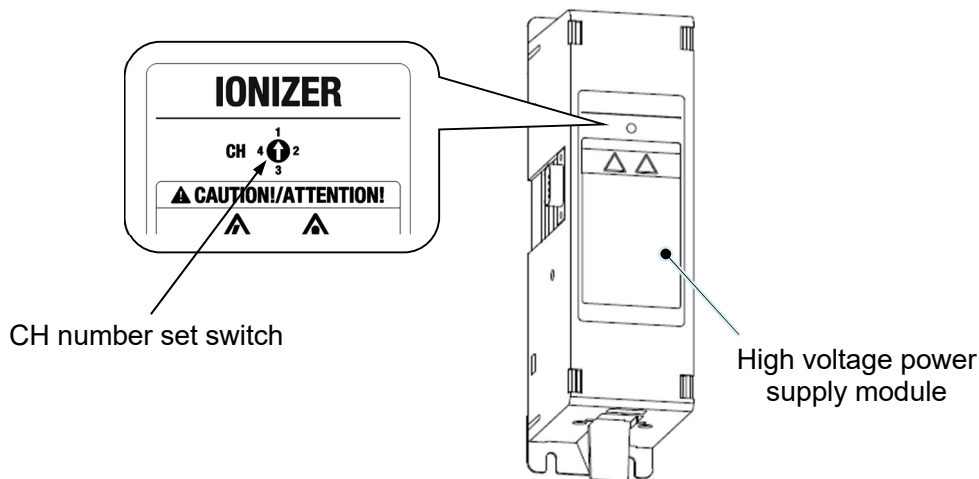
Example shows selecting CH1.

[Selection of the channel]

- The selected CH will flash.
- Press the ▼ or ▲ button to select the bar (high voltage power supply module) to display or set.
- When the number of bars is zero, the CH LED does not change even by pressing the ▼ or ▲ button.

[Change to the next mode]

- To change to the next mode and store the selected CH setting press the S button once, the ▲ and S button simultaneously for 2 s or longer, or the S button for 3 s or longer. Refer to “4-4-1. Operation overview”.

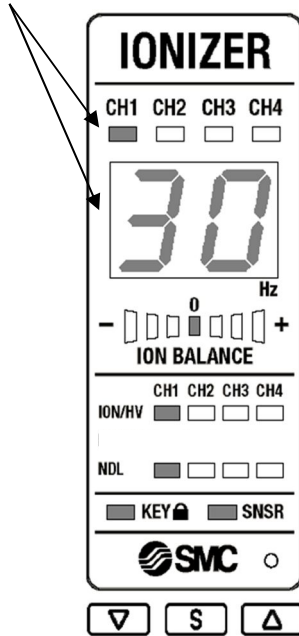


*Default: CH number is “1”.

4-4-3. Frequency set mode

- Set the ion generation frequency of the bar (high voltage power supply module) selected by “Channel selection mode”.

Flash (green)



[Ion generating frequency setting]

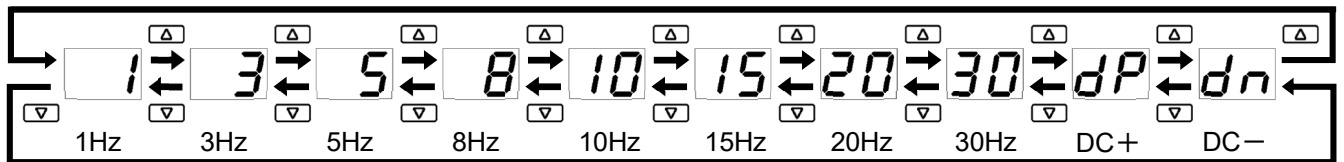
- Select the CH in the selection mode and press the S button once. The frequency will flash and the setting of the ion generation frequency of the selected bar becomes possible.
- The Ion generation frequency is set by pressing the ▼ or ▲ button.

[Change to the next mode]

- Press the S button once to store the frequency setting and change to the next mode.
- When the power is supplied the saved setting will be displayed.

Example of frequency setting mode for CH1.
Frequency 30 Hz.

Display of frequency



***Default**

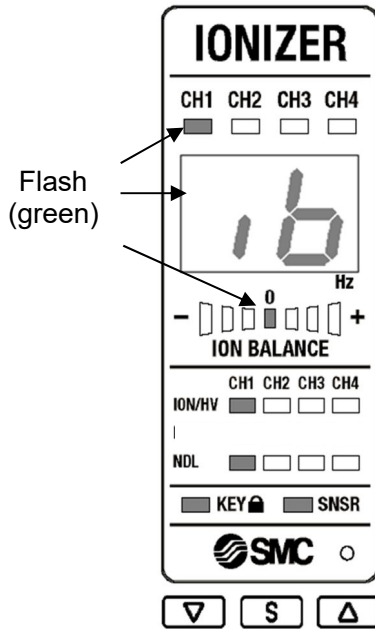
- Default frequency setting is “30 Hz”.
- Set the optimum frequency depending on the operating environment and installed distance.

***Caution**

- If the mode is changed to ion generation stop mode during the frequency setting and the mode is released by turning off the power supply, the setting during change is not stored. Change the setting again.

4-4-4. Offset voltage adjustment mode

- Offset voltage is adjusted before shipment. However, readjustment of the offset voltage is possible where it is required depending on the installation environment. (The same applies when the ionizer is moved and installed in a different location.)
- When there are ionizers installed near the ionizer whose offset voltage is to be adjusted, stop the ionizers which are not adjusted for the offset voltage before starting adjustment.

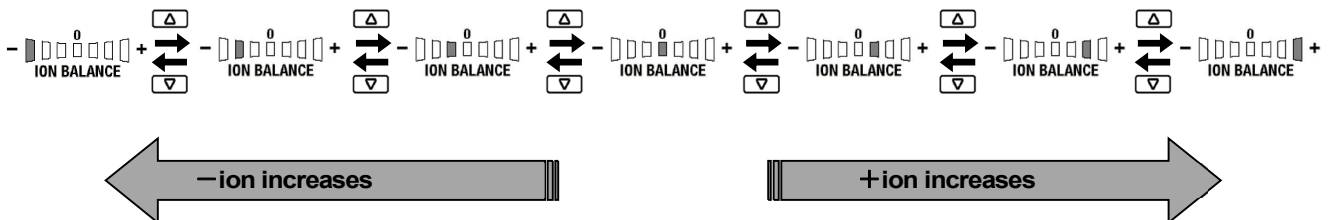


Example shows the offset voltage adjustment mode of CH1.

- Select the CH to be set in CH selection mode and press the S button twice. The frequency display “1b” and ion balance display will flash, and the adjustment of the offset voltage is now possible.
- When the built-in sensor is on, the Ion balance display shows the ion balance detected. Adjust so that the flashing LED becomes central.
- The LED turns on when it approaches the center, and flashes as it moves away from it. At the positive ion adjustment limit, the LED at the end of the positive side (right end of the display) flashes (orange). At the negative ion adjustment limit, the LED at the end of the negative side (left end of the display) flashes (orange).
- For highly precise offset voltage adjustment, adjust the ions generated by the ionizer by monitoring with a charge plate monitor.
- Press ▼ or ▲ button for adjustment. Press the ▲ button once to increase + ion, press and hold to continuously increase. Press the ▼ button once to increase - ion, press and hold to continuously increase.
- When the build-in sensor is on and cannot be adjusted ion balance to zero by pressing the button, turn the sensor off. The sensor may malfunction if there is an object with too much charge around it.

[Change to the next mode]

- Press the S button once to store the offset voltage adjustment setting and change to the next mode.
- When power is supplied, the saved setting will be displayed.

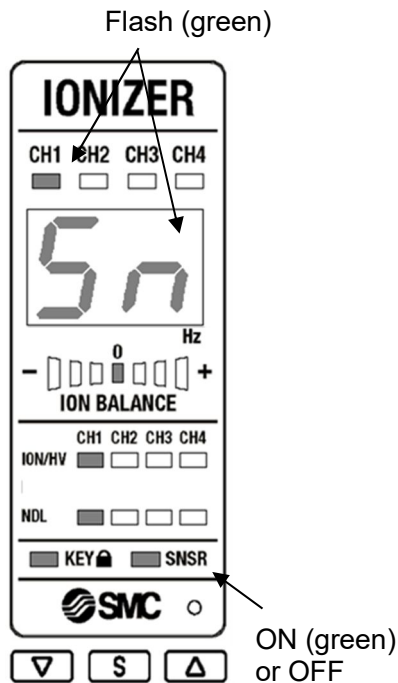


*Caution

- If the mode is changed to ion generation stop mode during offset voltage adjustment or the power supply is turned off, the change to the setting will not be stored. Change the setting again.

4-4-5. Balance control selection mode

- IZT45 have a built in sensor to balance the ions generated.
- Balance control selection mode turns the balance control by the built-in sensor on and off.



Example shows the ON status of CH1 balance control.

[Selection of balance control]

- Select the CH to be set in CH selection mode and press the S button and ▲ button simultaneously for 2 s or longer. The frequency display indicates “5n” flashing, and the switching of ON and OFF of balance control is now possible.
- The Sensor display (SNSR) LED (green) alternates ON and OFF each time the ▼ or ▲ button is pressed.
- Balance control ON: Sensor display (SNSR) LED is ON
- Balance control OFF: Sensor display (SNSR) LED is OFF

[Change to the next mode]

- Press the S button once to store the balance control selection setting and change to the next mode.
- When power is supplied the saved setting will be displayed.

*Default

- Default balance control setting is OFF.

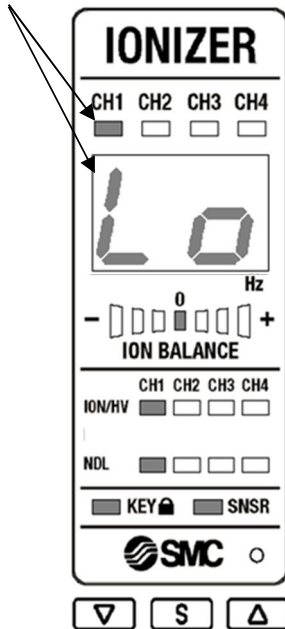
*Caution

- If the mode is changed to ion generation stop mode during balance control selection or if the power supply is turned off, the change to the setting will not be stored. Change the setting again.

4-4-6. Maintenance detection level selection mode

- If this product is used for an extended period of time, contamination such as dust will stick to the emitters, reducing the static neutralization performance.
- The timing of when maintenance is required varies depending on the environment in which it is installed.
- This product has a function which monitors the emitter contamination all the time. When the emitter contamination is detected, it is indicated by the maintenance signal and LED.
- In maintenance detection level selection mode, the detection level of the emitter contamination can be set.

Flash
(green)

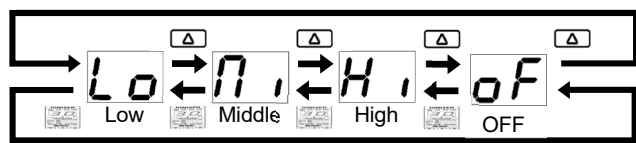


Example shows the emitter contamination detection level of CH1.

Default maintenance detection level setting is "Middle".

[Maintenance detection level selection method]

- In CH selection mode, press the S and ▲ buttons simultaneously for 2 s or longer to move to balance control selection mode.
- By pressing the S button once, "Xi", "Mi", "Lo" or "oF" will flash in the frequency display. The maintenance detection level can now be selected.
- It can be set by pressing the ▼ or ▲ button.



- **Lo (Low)**.....Static neutralization time is slower than the initial state.
- **Mi (Middle)**....Before the static neutralization time becomes slow.
- **Xi (High)**.....No influence to the static neutralization time.
- **oF (OFF)**.....Maintenance detection is OFF.

[Change to the next mode]

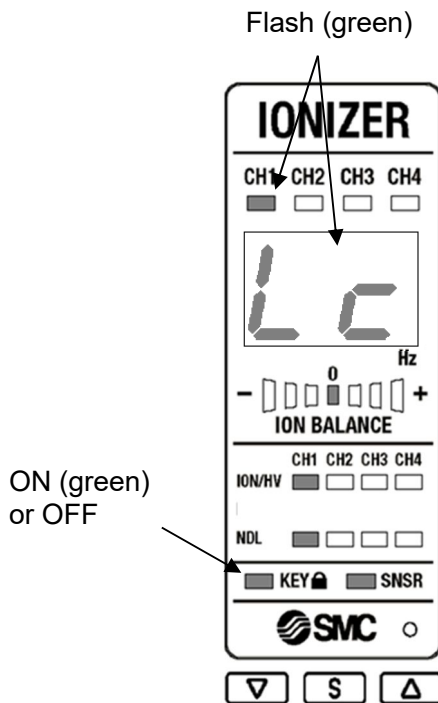
- Press the S button once to store the maintenance detection level selection setting and change to the next mode.
- When power is supplied, the saved setting will be displayed.

*Caution

- If the mode is changed to ion generation stop mode during maintenance detection level selection or the power supply is turned off, the change to the setting will not be stored. Change the setting again.

4-4-7. Key-lock setting mode

- IZTC45 have a key lock function which disables any button operation.



Example shows Key lock ON.

[Key-lock setting]

- Press the S button for 3 s or longer in CH selection mode, "Lc" or "VL" will flash in the frequency display and the ON/OFF setting of the key lock function is now possible.
- The key lock condition is indicated by "Lc" in the frequency display and by the key lock LED (green).

- Key lock function ON :
Frequency display : "Lc" flashes / KEY LED is ON
- Key lock function OFF :
Frequency display : "VL" flashes / KEY LED is OFF

[Change to the next mode]

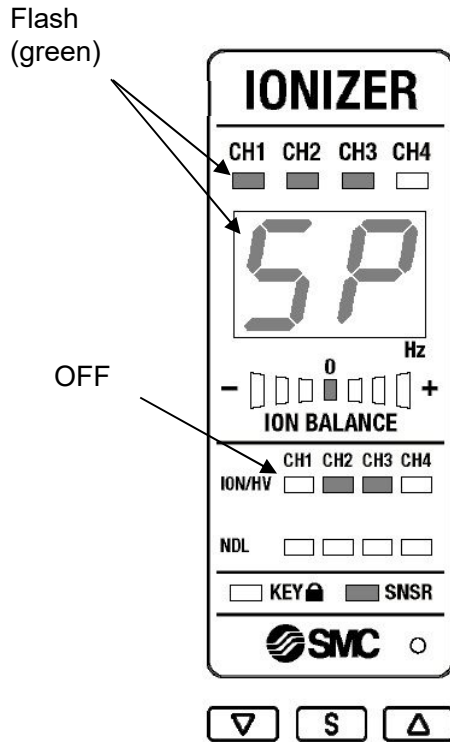
- Press the S button once to store the key lock setting and change to CH selection mode.
- When power is supplied, the saved setting will be displayed.

*Default

- Default key lock setting is OFF.

4-4-8. Ion generation stop mode

- In addition to the external input signal, the product will stop ion generation temporarily by pressing a button.
- Ion generation stop by button operation stops the high-voltage power supply module of the selected CH. On the other one, if an external input signal is used to stop ion generation, all connected bars will stop.
- The button operation and the external input signal take priority over the one executed first, and the other's stop instruction becomes invalid.



[Ion generating stop setting]

- In Channel selection mode, frequency set mode, offset voltage adjustment mode, balance control selection mode or maintenance detection level selection mode, ion generation is stopped by pressing the ▼ and ▲ button simultaneously for 2 s or longer.
- At that time, "5p" is displayed in the frequency display and the ION/HV LED of the selected CH is turned off.

[Ion generation stop release]

- To release the mode, press the S button once to return to the previous setting mode.
- Although the ion generation stop mode can be released by turning the power supply off and on again, the changes set in the previous mode will not be stored. It is necessary to change the setting again.

*Caution

- Ion generation is continue other than the selecting CH. Be careful when handling the high voltage power supply module and bar.

4-5. Alarm function

- When a problem occurs, an output signal or LED notification is generated.
- Depending on the content of abnormality, this product either continues or stops operation.

Table6. Alarm list

Alarm name	Output signal	Operation after alarm	LED							Description	How to return to work after a problem is solved
			CH	Frequency	ION BALANCE	ION/HV	NDL	SNSR	KEY		
Abnormality of the CPU (Controller)	Error signal OFF (B contact)	Stop	Green (ON) Note30	Green (flash) Error code E0	OFF	Red (flash) Note35	OFF	OFF	OFF or Green (ON) Note41	· When CPU operates abnormally due to noise etc. · When the CH is switched during operation.	· Turn the power off and on again.
Abnormality of the power supply	Error signal OFF (B contact)	Stop	Green (ON) Note31	Green (flash) Error code E1	OFF	Red (flash) Note36	OFF	OFF or Green (ON) Note41	OFF or Green (ON) Note41	· When the connected power supply voltage is outside of the specification.	· To be reset automatically.
Abnormality of the CPU (High voltage power supply module)	Error signal OFF (B contact)	Stop	Green (flash) Note32	Green (flash) Error code E2	OFF Note34	Red (flash) Note37	OFF Note40	OFF or Green (ON) Note41	OFF or Green (ON) Note41	· When CPU operates abnormally due to noise etc. · When the bar is not connected.	· Turn the power off and on again.
Abnormality of the High voltage	Error signal OFF (B contact)	Stop	Green (flash) Note32	Green (flash) Error code E3	OFF Note34	Red (ON) Note38	OFF Note40	OFF or Green (ON) Note41	OFF or Green (ON) Note41	· When the high voltage is discharged abnormally.	· Ion generation stop signal OFF and ON again. · Turn the power off and on again.
Communication error	Error signal OFF (B contact)	Stop	Green (flash) Note32	Green (flash) Error code E4	OFF Note34	Red (flash) Note37	OFF Note40	OFF or Green (ON) Note41	OFF or Green (ON) Note41	· When communication error occurs due to noise or disconnected, etc.	· Ion generation stop signal OFF and ON again. · Turn the power off and on again.
Abnormality of the cooling fan motor	Error signal OFF (B contact)	Stop	Green (flash) Note32	Green (flash) Error code E5	OFF Note34	Red (flash) Note37	OFF Note40	OFF or Green (ON) Note41	OFF or Green (ON) Note41	· When the cooling fan motor does not operate properly due to foreign matter caught.	· Ion generation stop signal OFF and ON again. · Turn the power off and on again.
Inconsistent module	Error signal OFF (B contact)	Stop	Green (flash) Note32	Green (flash) Error code E6	OFF Note34	Red (flash) Note37	OFF Note40	OFF or Green (ON) Note41	OFF or Green (ON) Note41	· High voltage power supply module which is not correct combination was connected to the controller.	· Turn the power off and on again.
Duplication of CH	Error signal OFF (B contact)	Stop	Green (flash) Note32	Green (flash) Error code E7	OFF Note34	Red (flash) Note37	OFF Note40	OFF or Green (ON) Note41	OFF or Green (ON) Note41	· Duplication of the CH setting of the high voltage power supply module connected to the controller exists.	· To be reset automatically.
Output signal over current	· Maintenance detection signal OFF (A contact) · Error signal OFF (B contact)	Continue	Green (flash) Note32	Green (flash) Error code E8 E9	Green (ON)	Green (flash) Note39	OFF or Green (ON) Note41	OFF or Green (ON) Note41	OFF or Green (ON) Note41	· When over current is applied to the output circuit and protective circuit is activated.	· To be reset automatically.
Maintenance warning	Maintenance detection signal ON (A contact)	Continue	Green (flash) Note32	Green (ON) Frequency Note33	Green (ON)	Green (ON)	Green (ON)	OFF or Green (ON) Note41	OFF or Green (ON) Note41	· When static neutralization performance is reduced due to contamination, deterioration or breakage of emitters.	· Ion generation stop signal OFF and ON again. · Turn the power off and on again.
High voltage power supply module not connected	Error signal OFF (B contact)	Stop	OFF	Green (flash) Error code --	OFF	OFF	OFF	OFF	OFF or Green (ON) Note41	· High voltage power supply module to be connected to the controller is not connected.	· Turn the power off and on again.

Note30) All CH LEDs in the CH table are ON (green).

Note31) LED for all connected high voltage power supply modules CH flash (green).

Note32) LED for CHs selected to display flashing (green).

Note33) Displays the frequency setting status of the selected CH.

Note34) Ion balance of the high voltage power supply module with problem turns off.

Note35) All ION/ HV LEDs for CH1 to 4 flash (red).

Note36) LED of all connected high voltage power supply modules ION/HV flash (green).

Note37) LED of high voltage power supply module ION/HV with abnormality flashes (red).

Note38) LED of high voltage power supply module ION/HV with abnormality is ON (red).

Note39) LED of all connected high voltage power supply modules ION/HV flash (green).

Note40) LED of high voltage power supply module NDL with abnormality is OFF.

Note41) The screen at the time abnormality occurs holds the status before the abnormality.

Details of the alarms:

1) Abnormality of the CPU (Controller)

- If the controller CPU operation is abnormal due to electrical noise, or when the CH is switched during operation, the abnormal signal is OFF, and all CH LEDs (green) are ON and all ION/HV LEDs are flashing (red) and the error code "E0" is displayed in frequency display flashing red.
- When the alarm occurs, the ion generation will be stopped.
- To prevent noise, perform the following actions and take countermeasures.
 - I . If the source of noise is nearby, move this product away from the source.
 - II . Route the power line and this product cables separately.
 - III . If noise may enter the product from the power supply, install a noise filter to this product power supply.
- After resolving the cause, supply power again.

2) Abnormality of the power supply

- When the power supply connected to this product is not within the specified range of 24 V +/-10%, the abnormal signal is OFF, and CH LEDs connected to the bar are ON (green), ION/HV LEDs of connected CH are flashing (red) and the error code "E1" is displayed flashing in the frequency display.
- When the alarm occurs, the ion generation will be stopped.
- The problem is automatically released by changing the power supply voltage to 24V+/-10%.

3) Abnormality of the CPU (High voltage power supply module)

- If the high voltage power supply module CPU operation is abnormal due to electrical noise, or the bar is not connected to the high voltage power supply module, the abnormal signal is OFF, and ION/HV LED for the CH with abnormality is flashing (red) and the error code "E2" is displayed flashing in the frequency display.
- When the alarm occurs, only the bar with a problem will stop ion generation.
- To prevent noise, perform the following actions and take countermeasures.
 - I . If the source of noise is nearby, move this product away from the source.
 - II . Route the power line and this product cables separately.
 - III . If noise may enter the product from the power supply, install a noise filter to this product power supply.
- After resolving the cause, supply power again.

4) Abnormality of the High voltage

- When abnormal discharge occurs during this product operation, the abnormal signal is OFF, and the ION/HV LED for the CH with abnormality is ON (red) and the error code "E3" is flashing in the frequency display.
- When the alarm occurs, only the bar with a problem will stop ion generation.
- After resolving the cause, input the ion generation stop signal ON once and then OFF or supply power again.

5) Communication error

- When abnormality occurs in the communication between the controller and high voltage power supply module due to electrical noise or disconnection, the abnormal signal is OFF, and the ION/HV LED of CH with abnormality is flashing (red) and the error code "E4" is flashing in the frequency display. Ion generation stops at this time.
- To prevent noise, perform the following actions and take countermeasures.
 - I . If the source of noise is nearby, move this product away from the source.
 - II . Route the power line and this product cables separately.
 - III . If noise may enter the product from the power supply, install a noise filter to this product power supply.
- After resolving the cause, input the ion generation stop signal ON once and then OFF or supply power again.

6) Abnormality of the cooling fan motor

- When fan motor operation error occurs during the operation, the abnormal signal is OFF, and the ION/HV LED for the CH with abnormality is flashing (red) and the error code “E5” is flashing in the frequency display.
- When the alarm occurs, only the bar with a problem will stop ion generation.
- To prevent noise, perform the following actions and take countermeasures.
 - I . If the source of noise is nearby, move this product away from the source.
 - II . Route the power line and this product cables separately.
 - III . If noise may enter the product from the power supply, install a noise filter to this product power supply.
- After resolving the cause, input the ion generation stop signal ON once and then OFF or supply power again.

7) Incompatible module

- When an incompatible high voltage power supply module is connected to the controller IZTC45, the abnormal signal is OFF, and the ION/HV LED of CH with abnormality is flashing (red) and the error code “E6” is flashing in the frequency display.
- Connect the correct high voltage power supply module corresponding to the controller and turn on the power supply again.

8) Duplication of CH number

- When multiple bars are connected to the controller and the settings of the CH number on the high voltage power supply module are duplicated, the abnormal signal is OFF, and the ION/HV LED for the CH of the bars which are duplicated are flashing (red) and the error code “E7” is flashing in the frequency display.
- The abnormality is automatically released when the setting of the CH number on the high voltage power supply module is not duplicated.

9) Output signal over current

- When current exceeding the specification value is applied to the maintenance output or abnormal output, the output is shut off to protect the output circuit, and the LEDs for all ION/HV connected to the bar flash (green) and the error code “E8” or “E9” is flashing in the frequency display.
- “E8” indicates excess current for the abnormal signal. “E9” indicates excess current for the maintenance signal.
- This product operates even when excessive current is generated in the output circuit.
- To resolve the error, reset the product automatically by reducing the current to the output circuit down to 100 mA or less.

10) Maintenance warning

- The maintenance signal is ON when contamination, degradation or damage to the emitters is detected. The NDL LED (green) for the bar with the problem is ON to indicate that cleaning or replacement of the bar needs to be performed.
- This product operates even when the maintenance warning is generated.
When emitters are contaminated, the error can be solved by cleaning them. However, when they are degradation or damaged, it is necessary to replace the bar with a new one.
- After resolving the cause, input the ion generation stop signal ON once and then OFF or supply power again.

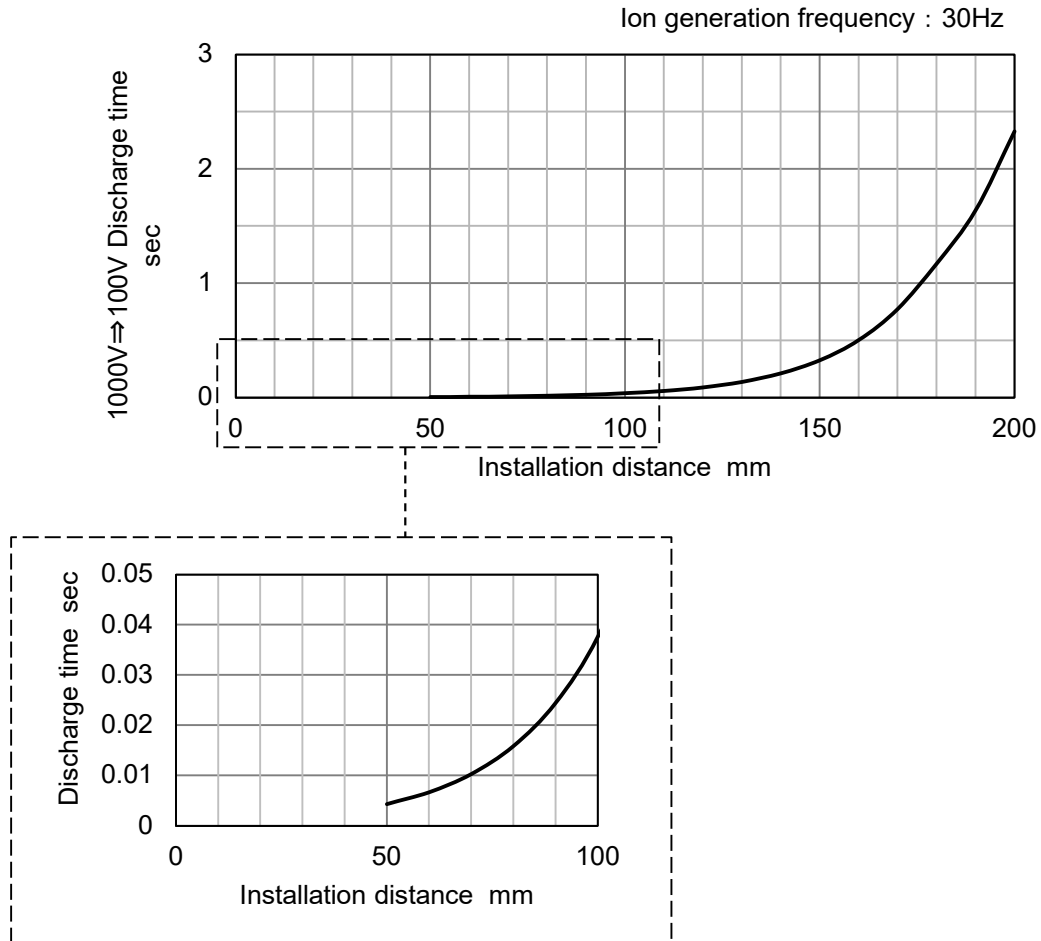
11) High voltage power supply module not connected

- When the controller and high voltage power supply module are not connected, the abnormal signal is OFF, and error code “-” is flashing in the frequency display.
- To release the abnormality, connect the high voltage power supply module to the controller and turn on the power supply.

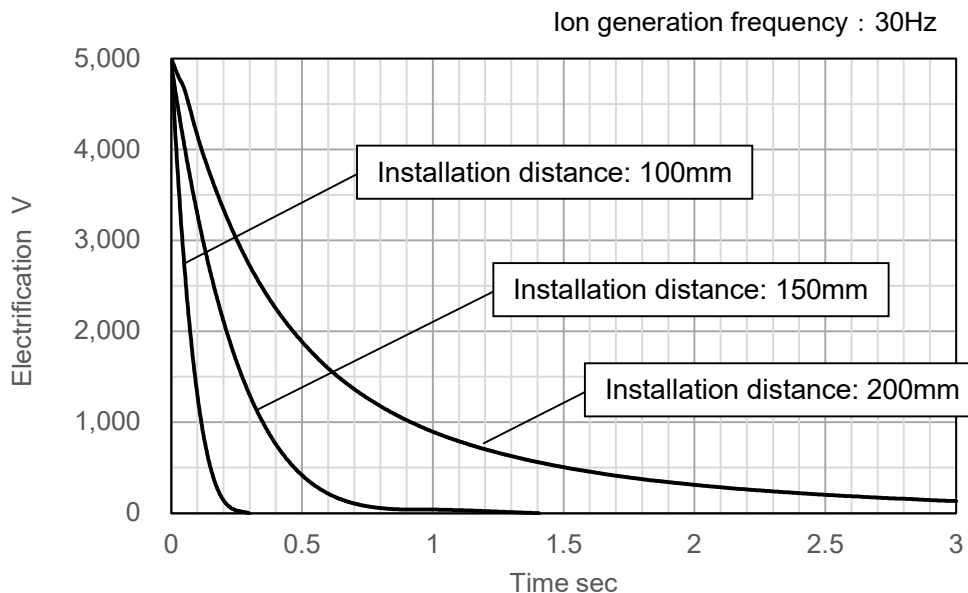
5. Performance

- Performance data shown in this chapter is based on an electrified plate (dimensions: 150 x 150 mm, electrostatic capacity: 20pF) defined by ANSI standard (ANSI/ESD STM3.1-2015). Use this data as a guideline for selection, as the performance data may vary depending on the material and size of the workpiece.

(1) Installation distance and Discharge time



(2) Electrification of workpiece

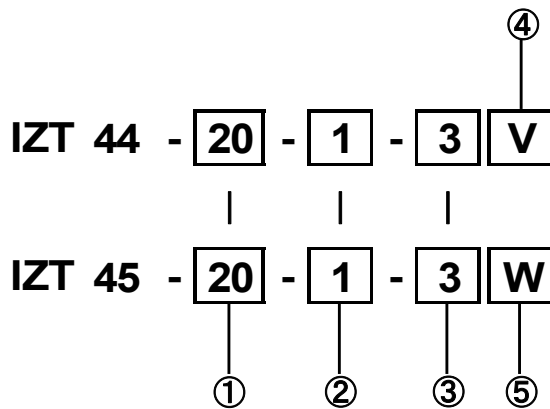


6. How to Order

- The product number consists of the controller, high voltage power supply module and bar (1 of each).
- When multiple high voltage power supply modules and bars are added to one IZT45 controller, choose the equipment according to the product number for a single unit.

6-1. Product number of multiple together.

Bar + High voltage power supply module + Controller



① Bar length

Symbol	Length(mm)	Symbol	Length(mm)
20	200	56	560
26	260	62	620
32	320	68	680
38	380	74	740
44	440	92	920
50	500	128	1280

*The number of included brackets differs depending on the bar length.(Refer to the table below.)

Number of brackets for bar

Bar length (mm)	End bracket	Intermediate bracket
200~620	2	None
680~1280		1

② High voltage cable length

Symbol	Length(m)
1	1
2	2
3	3

*The number of included high voltage cable holders differs depending on the high voltage cable length.(Refer to the table below.)

Number of included high voltage cable holders

Symbol	Straight	Elbow
1	1	1
2	2	1
3	3	1

③ Power supply cable length

Symbol	Length(m)
3	3
5	5
10	10
N	None

*To use AC adapter, specify "N", and select AC adapter with the option number.

④ DIN rail mounting bracket for controller of IZT44

Symbol	For controller
Nil	None
V	Included

⑤ DIN rail mounting bracket for controller of IZT45

Symbol	For controller	For high voltage power
Nil	None	None
U	Included	Included
W	Included	None
Y	None	Included

6-2. Product number for single unit (for individual Parts)

Bar

IZTB 44 - 20 - 1 -

① Bar length

Symbol	Bar length (mm)
20	200
26	260
32	320
38	380
44	440
50	500
56	560
62	620
68	680
74	740
92	920
128	1280

② High voltage cable length

Symbol	Length(m)
1	1
2	2
3	3
N	None

* The number of included high voltage cable holders differs depending on the high voltage cable length.(Refer to the table below.)

* When using a branch cable, indicate with "N" and select a branch cable from the accessories.

Number of included high voltage cable holders

Symbol	Straight	Elbow
1	1	1
2	2	1
3	3	1

③ Bar bracket

Symbol	For bar
Nil	None
B	Included

*The number of included brackets differs depending on the bar length.(Refer to the table below.)

Number of brackets for bar

Bar length(mm)	End bracket	Intermediate bracket
200~620	2	None
680~1280		1

High voltage power supply module

IZTP 41 - L -

①

① DIN rail mounting bracket

Symbol	Model
Nil	None
Y	Included

Controller

IZTC 44 - 3 V

IZTC 45 - 3 W

①

③

① Power supply cable length

Symbol	Length(m)
3	3
5	5
10	10
N	None

*To use AC adapter, specify "N", and select AC adapter with the option number.

② DIN rail mounting bracket for controller of IZT44

Symbol	Model
Nil	None
V	Included

③ DIN rail mounting bracket for controller of IZT45

Symbol	Model
Nil	None
W	Included

6-3. Accessories (for individual Parts)

Power supply cable

IZT 44 - CP **3**

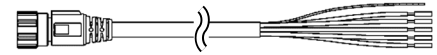
|

IZT 45 - CP **3**

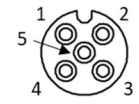
①

① Power supply cable length

Symbol	Length(m)
3	3
5	5
10	10

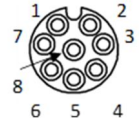


For IZT44



Socket
A-coded
(Normal key)

For IZT45



Socket
A-coded
(Normal key)

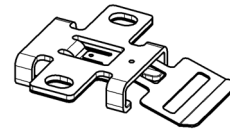
Bracket for bar

IZT 44 - B **E**

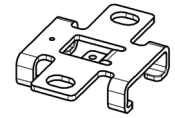
①

① Bar bracket

Symbol	Type
E	End bracket
M	Intermediate bracket



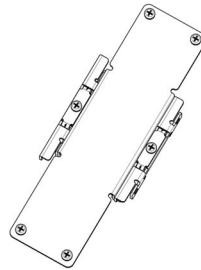
IZT44-BE
End bracket



IZT44-BM
Intermediate bracket

DIN rail mounting bracket for IZT44 controller with High voltage power supply

IZT 44 - B1



IZT44-B1

For controller with high voltage power supply

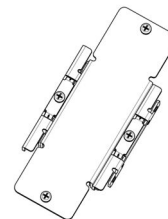
DIN rail mounting bracket for IZT45 controller and High voltage power supply module

IZT 40 - B **1**

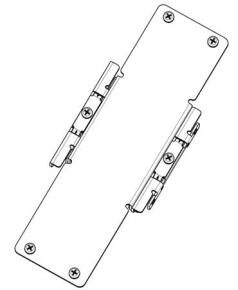
①

① DIN rail mounting bracket

Symbol	Type
1	For controller
2	For High-voltage power supply module



IZT40-B1
For controller



IZT40-B2
For High voltage power
Supply module

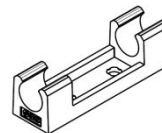
High voltage cable holder

IZT 40 - E **1**

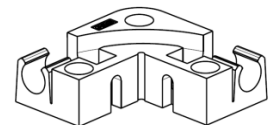
①

① Highvoltage cable holder

Symbol	Type
1	Straight
2	Elbow



IZT40-E1
High voltage cable holder
(Straight)



IZT40-E2
High voltage cable holder
(Elbow)

6-4. Accessories Sold separately

AC adapter

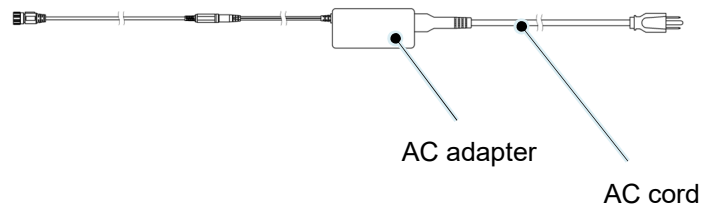
IZT 44 - CG 1

IZT 45 - CG 1

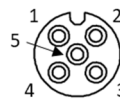
①

① AC cord

Symbol	Type
1	With AC cord
2	Without AC cord

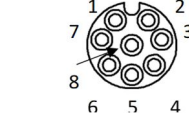


For IZT44



Socket
A-coded
(Normal key)

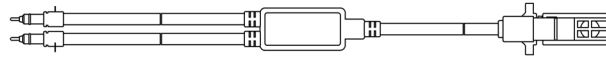
For IZT45



Socket
A-coded
(Normal key)

Branch cable

IZT 44 - A001



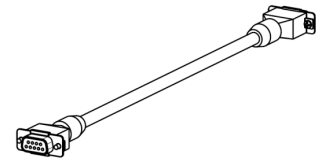
Separate cable

IZT 43 - A002 - 1

①

① High voltage cable length

Symbol	Length(m)
1	1
2	2
3	3



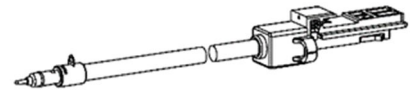
High voltage cable assembly

IZT 43 - A002 - 1

①

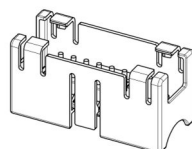
① High voltage cable length

Symbol	Length(m)
1	1
2	2
3	3



Emitter cleaning kit

IZT 44 - M3



7. Outline Dimensions

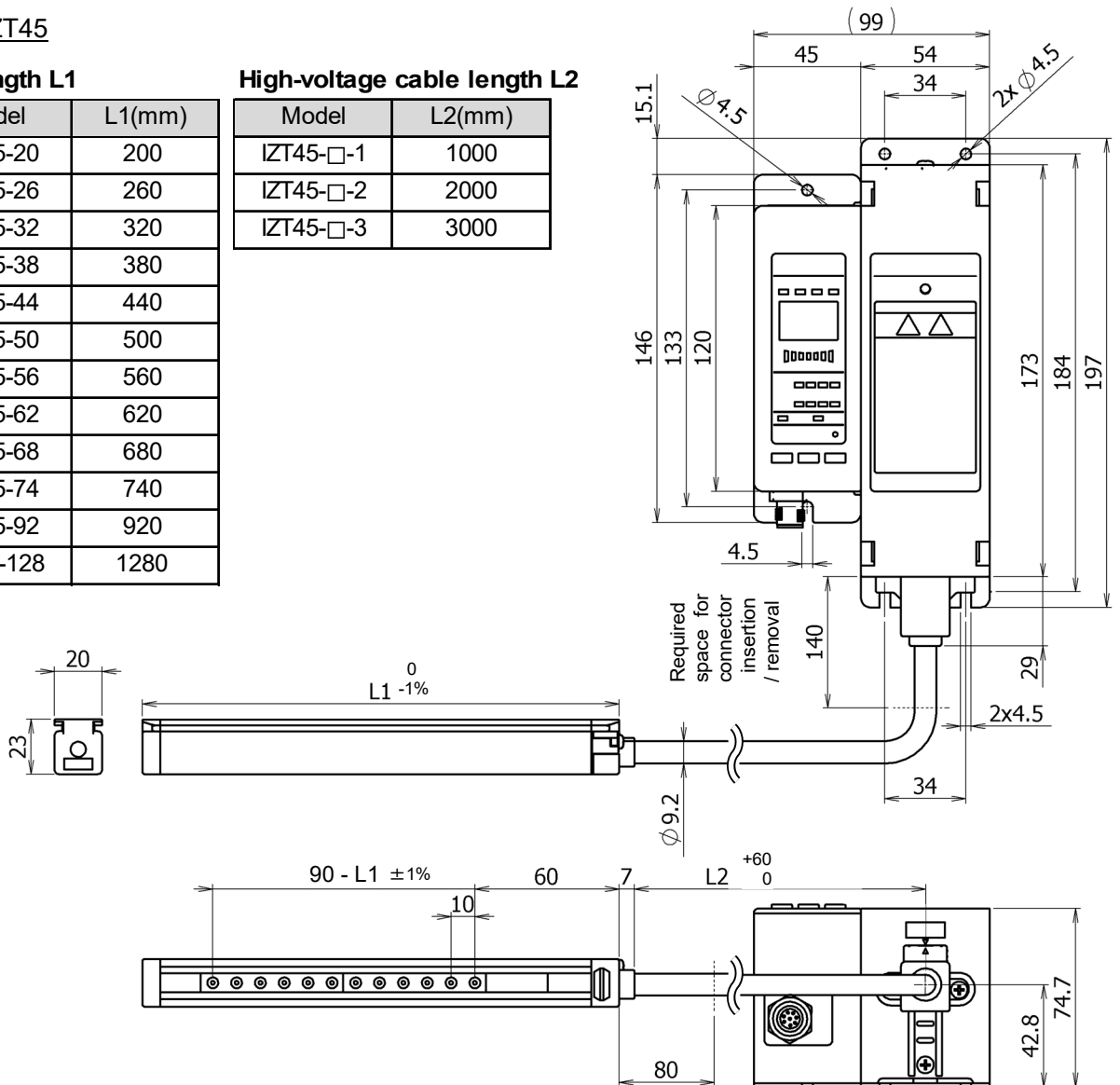
Ionizer IZT45

Bar length L1

Model	L1(mm)
IZT45-20	200
IZT45-26	260
IZT45-32	320
IZT45-38	380
IZT45-44	440
IZT45-50	500
IZT45-56	560
IZT45-62	620
IZT45-68	680
IZT45-74	740
IZT45-92	920
IZT45-128	1280

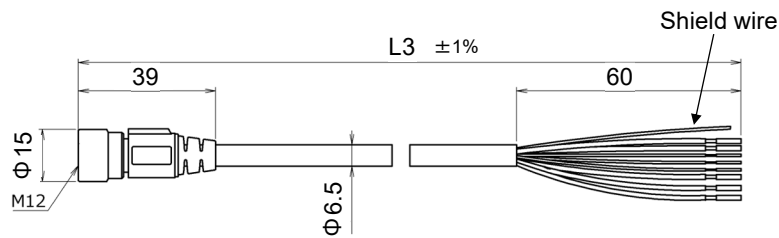
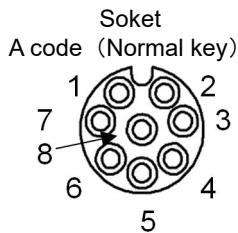
High-voltage cable length L2

Model	L2(mm)
IZT45-□-1	1000
IZT45-□-2	2000
IZT45-□-3	3000



Required space for connector insertion / removal

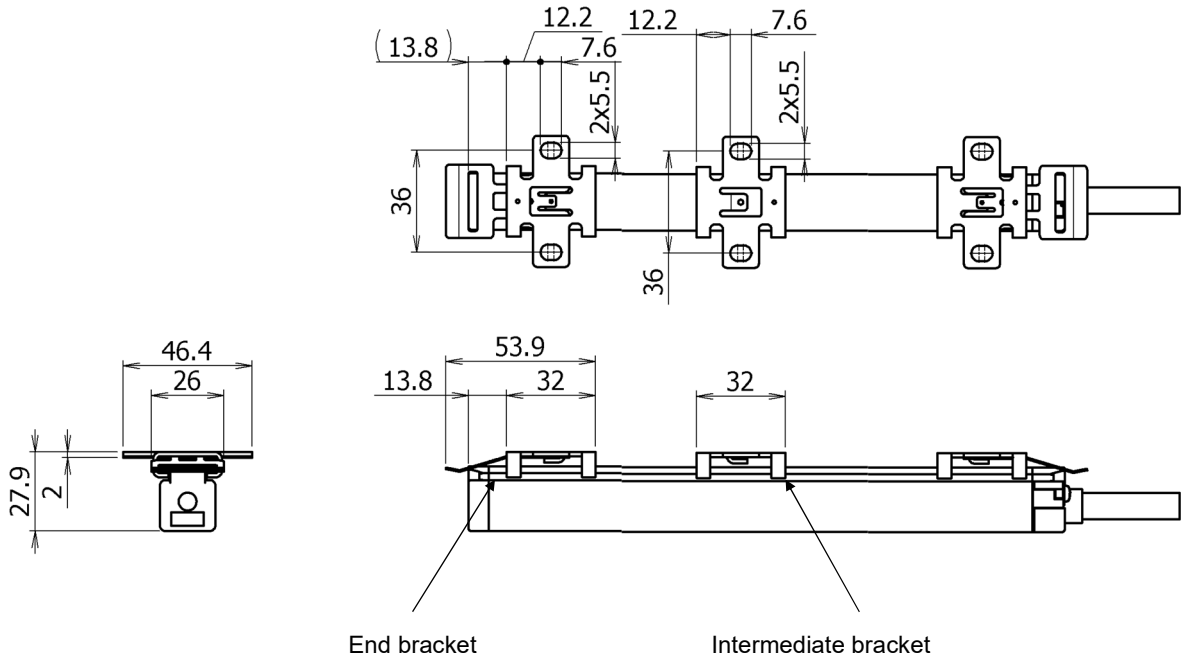
Power cable



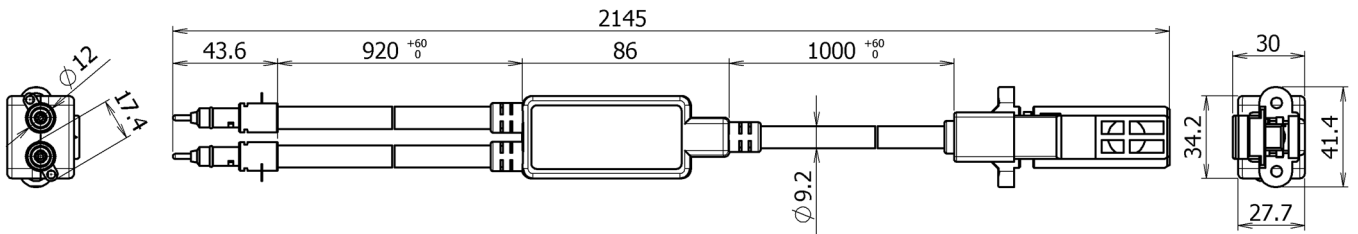
L3(mm)
3000
5000
10000

NO.	Cable color	Signal name	Conductor Nominal Cross Section / Size	Insulator O.D.	Sheath Material
1	Brown	DC(+)	0.5mm ² /AWG20	1.6mm	Lead-free PVC
2	Brown-White		0.5mm ² /AWG20	1.6mm	
3	Blue	DC(-)	0.5mm ² /AWG20	1.6mm	
4	Blue-White		0.5mm ² /AWG20	1.6mm	
5	Green	F.G.	0.5mm ² /AWG20	1.6mm	
6	Yellow	Ion generation stop signal	0.08mm ² /AWG28	1.0mm	
7	Black	Maintenance detection signal	0.08mm ² /AWG28	1.0mm	
8	White	Error signal	0.08mm ² /AWG28	1.0mm	

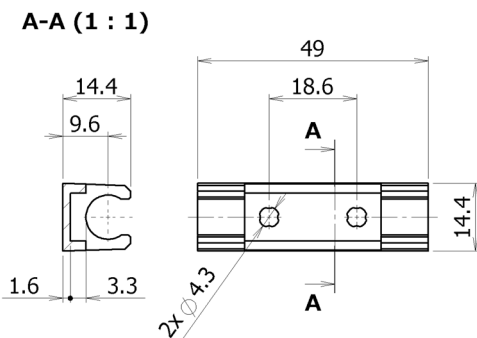
End bracket
Intermediate bracket



Branch cable / IZT44-A001

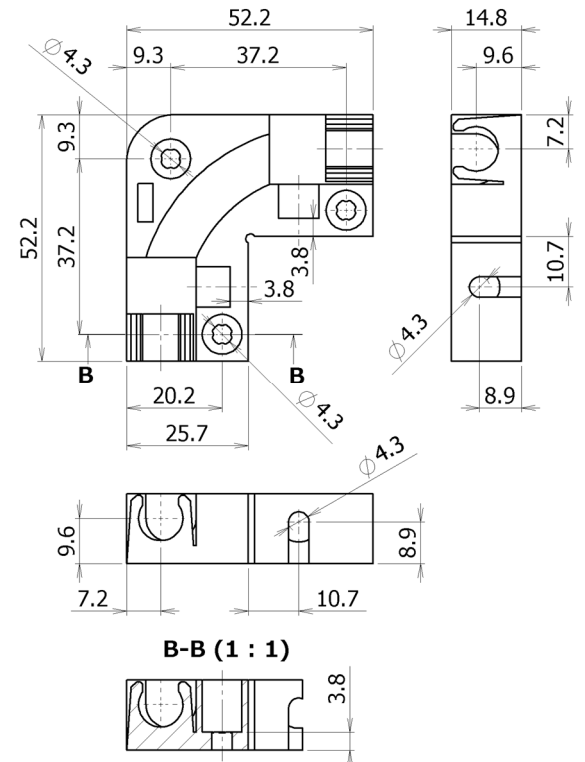


High voltage cable holder (Straight) / IZT40-E1



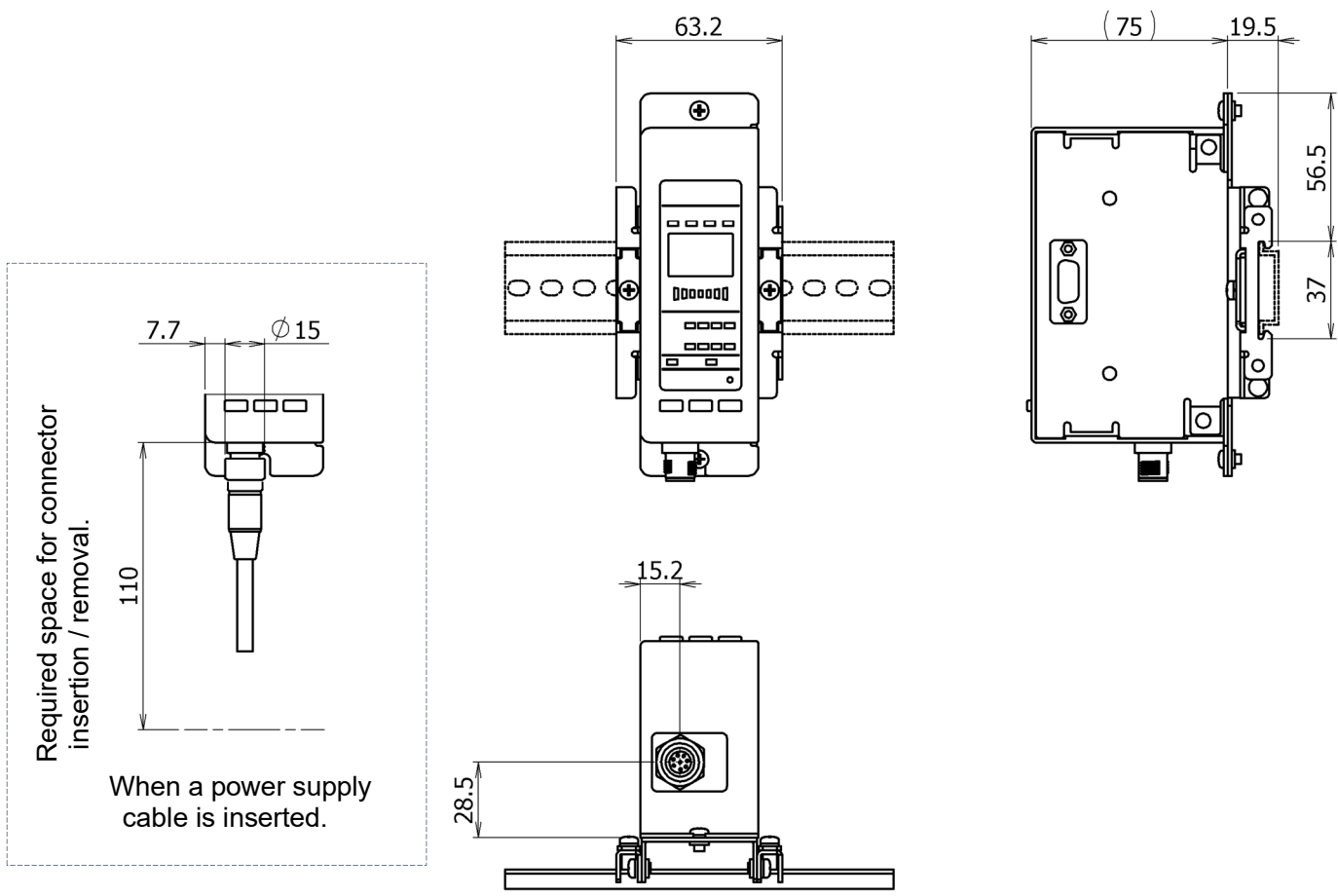
Recommended:
Cross-holed pan head screws M4x5

High voltage cable holder (Elbow) / IZT40-E2

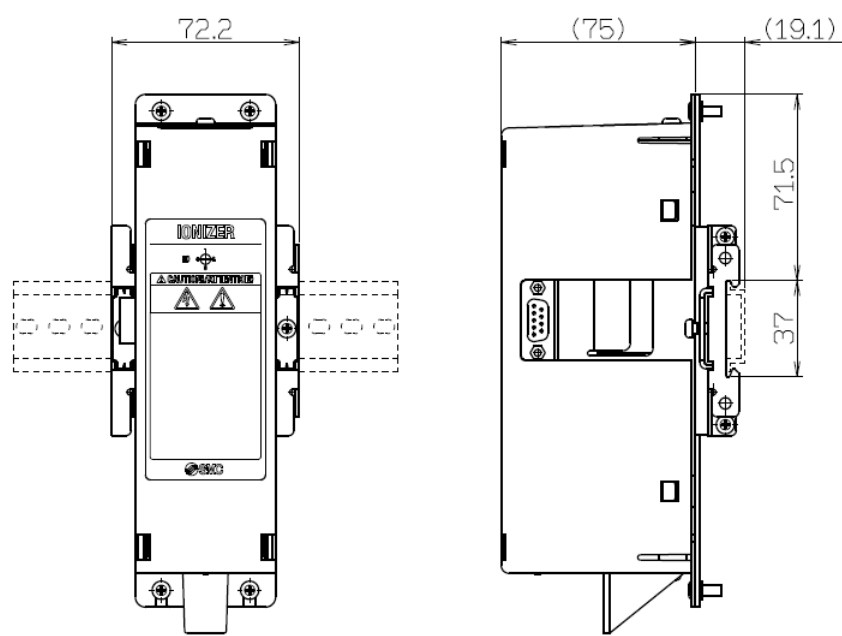


Recommended: Cross-holed pan head screws M4x8

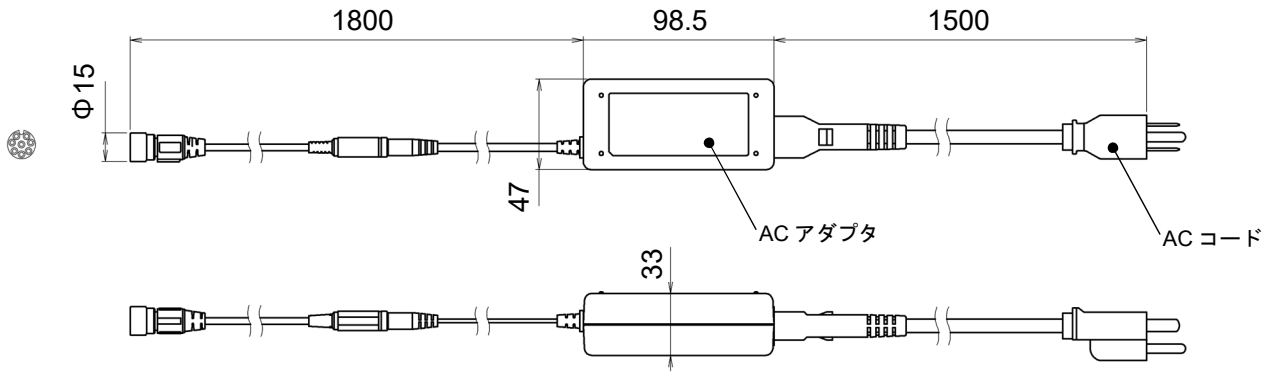
· When a DIN rail mounting bracket is used (IZT40-B1)



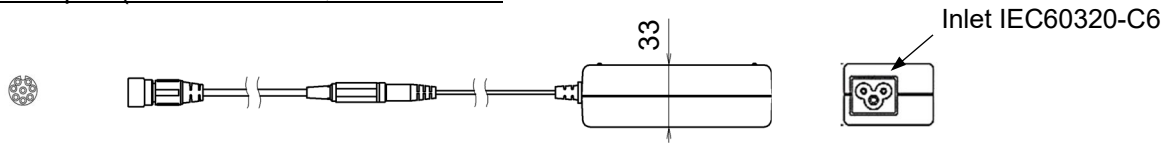
· When a DIN rail mounting bracket is used (IZT40-B2)



AC adapter (with AC cord) / IZT45-CG1



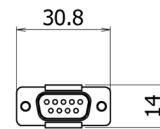
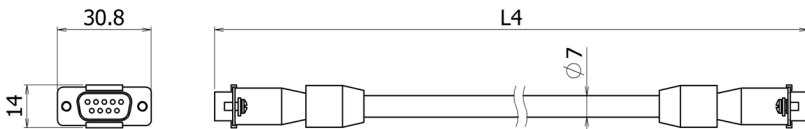
AC adapter (without AC cord) / IZT44-CG2



Input voltage	AC100V to 240V, 50/ 60Hz
Output current	1.9A
Ambient temperature	0 to 40°C
Ambient humidity	35 to 65%Rh (No condensation)
Weight	IZT45-CG1: 365g IZT45-CG2: 200g
Standard	IEC62368-1

*Caution
Only one high voltage power supply module can be used with the AC adapter.

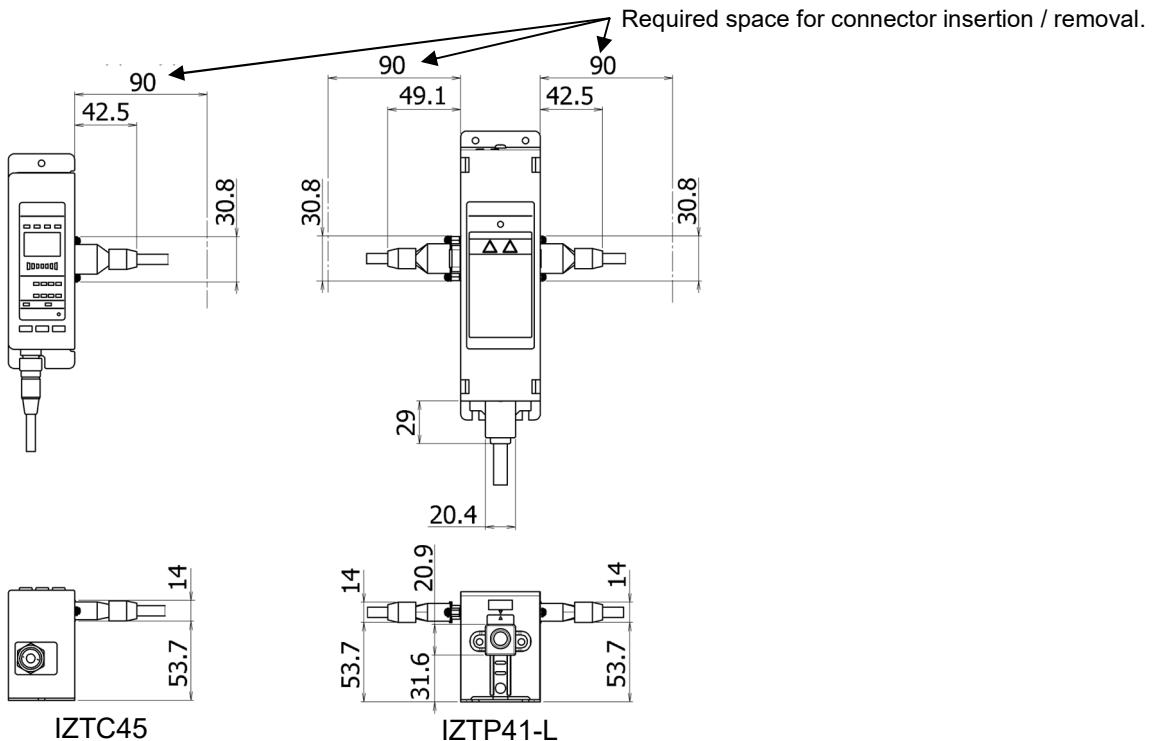
Separate cable IZT40-CF□



Cable length

Model	L4 (mm)
IZT40-CF1	1000
IZT40-CF2	2000
IZT40-CF3	3000

· When Separate cable is connected



8. Specification

Ionizer model		IZT44	IZT45
Ion generation method		Corona discharge type	
Method of applying voltage		Pulse AC、DC Note42)	
Applied voltage		±7,000V	
Current consumption		0.5A or less	0.6A or less (+0.5A or less per ionizer when connected)
Power supply voltage		DC24V±10% (AC100-240V : AC adapter. Applicable when only one high voltage power supply module is used)	
Switch input	NPN setting	-	Range : DC5V or less Current consumption : 5mA or less Note44)
	PNP setting	-	Range : 19VDC to supply voltage Current consumption : 5mA or less Note44)
Switch output (open collector)	NPN setting	Max. load current : 100mA Residual voltage : 1V or less (at 100mA of load current) Max. supply voltage : 26.4VDC Note43)	Max. load current : 100mA Residual voltage : 1V or less (at 100mA of load current) Max. supply voltage : 26.4VDC Note44)
	PNP setting	Max. load current : 100mA Residual voltage : 1V or less (at 100mA of load current) Note43)	Max. load current : 100mA Residual voltage : 1V or less (at 100mA of load current) Note44)
Function		High voltage abnormality detection, Check output	Auto balance, Maintenance detection, High voltage abnormality detection, Ion generation stop input, Check output
Ambient temperature	Controller, High voltage power supply module	0 to 40°C	
	Bar	0 to 50°C	
Ambient humidity		35 to 80%Rh (no condensation)	
Material	Controller	Cover : ABS, Aluminum	Cover : ABS, Aluminum Switch : Silicone rubber
	High voltage power supply module		Cover : ABS, Aluminum
	Bar	Cover : ABS, PBT, Emitter : Tungsten High voltage cable : Silicone rubber, PVC. Screw : SUS	
IP Protection Rating	Controller	IP20	IP20
	High voltage power supply module		IP20
	Bar	IP40	
Standard / Directive		CE (EMC directive, RoHS directive), UKCA	

Note 42) Apply cathode or anode to DC.

Note 43) Can be switched by wiring.

Note 44) Can be switched by controller operation.

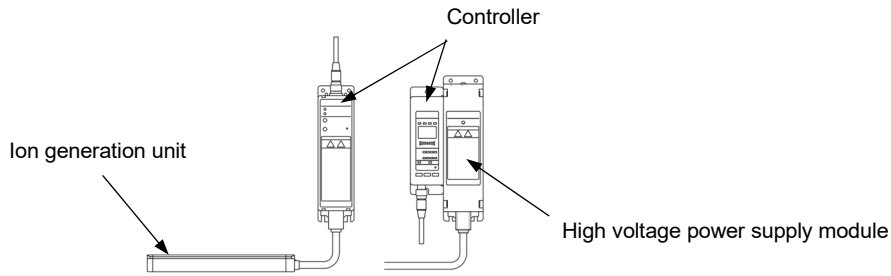
Weight [g]

	Controller	High voltage power supply module
IZT44	440	
IZT45	220	690

Bar length mm	200	260	320	380	440	500	560	620	680	740	920	1280
High voltage cable 1m	250	275	305	330	360	385	415	440	470	495	575	740
High voltage cable 2m	365	395	420	450	475	500	530	555	585	610	690	855
High voltage cable 3m	480	510	535	565	590	620	645	670	700	725	810	970



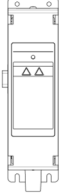
9. Interchangeability

- IZT44/45 can be used in combination with the following products of IZT40/41/43 series. (Individual order)







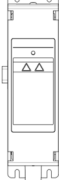
			Controller					High voltage power supply module				
			IZTC40	IZTC41	IZTC41-L	IZTC44	IZTC45	IZTP40	IZTP41	IZTP43	IZTP41-L	IZTP43-L
Ion generation unit	Bar (Air purge available)	IZTB40	○					○				
		IZTB40		○					○			
		IZTB40			○						○	
		IZTB40				○						
		IZTB40					○				○	
	Nozzle	IZTN43		○						○		
		IZTN43			○							○
		IZTN43					○					○
	Slim bar	IZTB44	○						○			
		IZTB44		○						○		
		IZTB44			○						○	
		IZTB44				○						
		IZTB44					○				○	

Ex.1 When the Slim bar is used with an existing IO-Link controller.

Bar	Controller	High voltage power supply module
IZTB44 	IZTC41-L 	IZTP41-L 

Ex.2 When using existing air purgeable bar IZTB40 with M12 power cable.

Bar	Controller with High voltage power supply	
IZTB40 	IZTC44 	

Bar	Controller	High voltage power supply module
IZTB40 	IZTC45 	IZTP41-L 

10. Troubleshooting

	Status	Possible causes	Investigation method and possible causes	Countermeasures	
Does not operate	The product does not turn ON. (LEDs is OFF)	Insufficient supply voltage or current.	Check the voltage and current capacity of the power supply.	Operate at the specified voltage and current consumption referring to [8. Specifications].	
		Power supply incorrectly wired.	Check the power supply wiring.	Ensure connections are in accordance with [3-2.Electrical connection].	
	"I O" or "NO" is displayed. (Initial setting is not done)	Initial setting is not done.	Initial setting is required.	Perform initial settings in accordance with the operation manual.	
		Error code "E0" is displayed. (Controller CPU abnormality)	Abnormality of the CPU	1) Check the emitter for contamination.	1) If dust or dirt is found on the emitter, clean the emitter referring to [11.Maintenance].
	2) Check whether there is arcing between the bar and workpiece to be neutralized.			2) If there is arcing between the workpiece to be neutralized and the bar, increase the distance between them until arcing no longer occurs.	
	Error code "E2" is displayed. (High voltage power supply module)	The bar not connected	3) Check whether the ionizer is used in an environment subject to condensation or moisture.	3) Check whether the ionizer is used in an environment subject to condensation or moisture.	3) The ionizer must not be used in environments subject to condensation or moisture.
			4) Check the High voltage connector for contamination.	4) Check the High voltage connector for contamination.	4) If dust or dirt is found on the connector, clean the connector.
	Error code "E4" is displayed. (Communication error)	Malfunction caused by noise.	Check the bar (high voltage cable connector) is connected.	Check the bar (high voltage cable connector) is connected.	If the connection does not resolve the problem, clean the high-voltage cable connector.
			1) Check the emitter for contamination.	1) Check the emitter for contamination.	1) If dust or dirt is found on the emitter, clean the emitter referring to [11.Maintenance].
	Error code "E1" is displayed. (Power supply failure)	Voltage of the power supply is out of range.	2) Check whether there is arcing between the bar and workpiece to be neutralized.	2) Check whether there is arcing between the bar and workpiece to be neutralized.	2) If there is arcing between the workpiece to be neutralized and the bar, increase the distance between them until arcing no longer occurs.
			3) Check whether the ionizer is used in an environment subject to condensation or moisture.	3) Check whether the ionizer is used in an environment subject to condensation or moisture.	3) The ionizer must not be used in environments subject to condensation or moisture.
	Error code "E3" is displayed. (Incorrect high voltage)	Abnormality of the High voltage	4) Check the High voltage connector for contamination.	4) Check the High voltage connector for contamination.	4) If dust or dirt is found on the connector, clean the connector.
			Check the voltage values of the power supply.	Check the voltage values of the power supply.	Operate at the specified voltage range referring to [8. Specifications].
Error code "E5" is displayed. (Fan motor failure)	The fan motor was clogged up with foreign matter.	1) Check the emitter for contamination.	1) Check the emitter for contamination.	1) If dust or dirt is found on the emitter, clean the emitter referring to [11.Maintenance].	
		2) Check whether there is arcing between the bar and workpiece to be neutralized.	2) Check whether there is arcing between the bar and workpiece to be neutralized.	2) If there is arcing between the workpiece to be neutralized and the bar, increase the distance between them until arcing no longer occurs.	
Error code "E6" is displayed. (High voltage power supply module inconsistent)	High voltage power supply module which cannot be connected to the controller.	3) Check whether the ionizer is used in an environment subject to condensation or moisture.	3) Check whether the ionizer is used in an environment subject to condensation or moisture.	3) The ionizer must not be used in environments subject to condensation or moisture.	
		4) Check the High voltage connector for contamination.	4) Check the High voltage connector for contamination.	4) If dust or dirt is found on the connector, clean the connector.	
Error code "E7" is displayed. (Duplication of CH)	CH setting is duplicated when multiple high voltage power supply modules are connected to the controller.	Check the fan motor is rotating for cooling which is installed in the high voltage power supply module.	Check the fan motor is rotating for cooling which is installed in the high voltage power supply module.	If foreign matter is clogged with the fan motor, remove the foreign matter.	
		High voltage power supply module which cannot be connected to the controller.	Check the model number of the controller and high voltage power supply module.	Select applicable controller and high voltage power supply module referring to [1.System construction] [9.Interchangeability].	
Error code "- -" is displayed. (High voltage power supply module not connected)	High voltage power supply module is not connected to the controller.	When multiple high voltage power supply modules are connected to the controller, make sure that the CH number set switch are not duplicated.	When multiple high voltage power supply modules are connected to the controller, make sure that the CH number set switch are not duplicated.	Make sure that the set numbers of the CH number set switch of the high voltage power supply module are not duplicated.	
		High voltage power supply module is not connected to the controller.	Check if the high voltage power supply module is connected to the controller.	Connect the high voltage power supply module to the controller.	
When multiple high voltage power supply modules are connected, the number of them and the number of the controller display are not consistent.	High voltage power supply modules are not connected.	1) Check if the high voltage power supply modules are connected each other.	1) Check if the high voltage power supply modules are connected each other.	1) Connect the high voltage power supply modules each other.	
		2) Check that the separate cable is not disconnected.	2) Check that the separate cable is not disconnected.	2) Replace the separate cable.	

LED is not lighting correctly.

Status	Possible causes	Investigation method and possible causes	Countermeasures
The LED of NDL indication lights up.	1)Contamination on the emitters. 2)Emitters degradation or damage.	Clean the emitter with the maintenance kit and check the static neutralization effect.	1)If dust or dirt is found on the emitter, clean the emitter referring to [11.Maintenance]. 2)If the effect is small even after maintenance of the emitter, replace the bar.
	Ion generation stop signal is input.	Check that the ion generation stop signal is not input.	When performing static neutralization, do not input the ion generation stop signal.
No output signal.	1) Signal wired incorrectly. 2) Wrong NPN/PNP setting.	1) Check the wiring referring to [3-2. Electrical connection]. 2) Check the output referring to [3-3.How to Check Output Signals].	1)Please wire correctly. 2)If NPN/PNP setting is made a mistake, set it referring to [2-2-2.Selection of NPN / PNP as input and output].
	<p>Error code "E8 " is displayed. (Error signal output over current)</p> <p>Error code "E9 " is displayed. (Maintenance signal output over current)</p>	Circuit protection operation due to signal overcurrent.	Check the signal load current.
Unable to turn ON/OFF Ion generation stop signal.	1) Signal wired incorrectly. 2) Wrong NPN/PNP setting.	1) Check the wiring with reference to [3-2. Electrical connection]. 2) Check the input/output settings with reference to [4-4. Controller Setting].	Make sure correct wiring and settings are made.
Poor neutralizing performance	Insufficient adjustment of offset voltage.	1)Check the offset voltage by the measurement equipment such as the charged plate. 2) Check the ion balance using the ion balance display of controller.	Adjust offset voltage referring to [4-4-4. Offset voltage adjustment mode].
	<p>Ionized air is not reaching the workpiece to be neutralized.</p> <p>1) Distance to the workpiece is far. 2) Interference with airflow. 3) Ionized air blocked or absorbed by obstacles. 4)Ionized air from a nearby ionizer is interfering.</p>	<p>1) Check if it is effective by moving it closer to the workpiece. 2) Check if an external airflow could interfere with the flow of ionized air from the ionizer. 3)Check to see if there are any obstructions in the path where the ionized air reaches the workpiece to be neutralized. 4) Compare the static elimination effect of ionized air generated from the ionizer with other ionizer running and stopped to see if the ionized air generated from the ionizer is being interfered with by ionized air generated from other ionizer.</p>	<p>1) Install the bar close to the workpiece. 2) If an external airflow is having an effect, consider shutting off the air flow or otherwise changing the installation so that ionized air is not interfered with. 3)If there is an object between or near the ionizer and the workpiece to be neutralized, ionized air may be blocked or adsorbed and not reach the workpiece. 4) If other ionizer is nearby installed, ionized air may interfere, resulting in reduced ionizer performance. Refer to [Limitation of use] before installation to avoid interference.</p>
The effect of the ionizer is small from the time of installation.	Ionizer potential reference is off.	Check F.G. (green wire) is connected.	The ionizer neutralizes static electricity relative to ground, ensure F.G.(green wire) always has a ground connection of less than 100Ω.
	Ion generation volume is low due to contamination on the emitter.	Check the emitter for contamination.	If dust or dirt is found on the emitter, clean the emitter referring to [11.Maintenance].
The effect of the ionizer became small after use.	Ion generation rate decrease due to emitter degradation or damage.	Clean the emitter with the maintenance kit and check the static neutralization effect.	If the effect is small even after maintenance of the emitter, replace the bar.

11. Maintenance

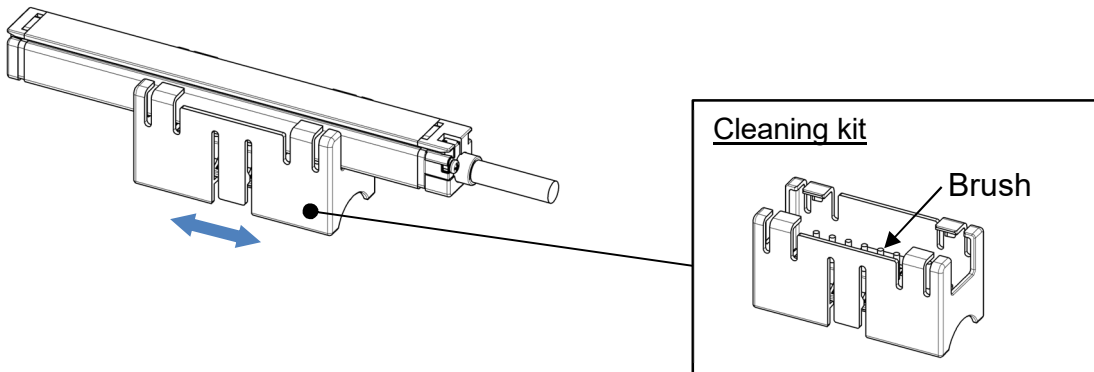
Warning

- A high voltage generating circuit is mounted onto this product.
- Verify that the power supply is OFF when performing maintenance.
- Never disassemble or modify the product, as this can cause loss of product functionality and a risk of electric shock and earth leakage.
- Do not touch the end of the emitters. They have a sharp end and touching them directly with your fingers may cause injury.
- Only people who have sufficient knowledge are allowed to clean the emitters.

- If this product is used for an extended period of time, contamination such as dust will stick to the emitters, reducing the static neutralization performance.
- The IZT45 is equipped with a maintenance detection function, so clean the emitter when it detects contamination.
- If the maintenance detection function is not used in the IZT45 or if the IZT44 is used, perform neutralizing performance test and set a maintenance cycle for periodic cleaning.
- An emitter contamination and a maintenance detection time is different depending on the installation environment, etc.
- If the maintenance LED is ON upon completion of cleaning the emitter, it may not have been cleaned sufficiently or it may be worn or damaged. If the emitters are worn out or damaged, replace the bar.
- If the emitter is worn out or damaged, the static electricity elimination performance will decrease.

Cleaning procedure of emitter

- It is highly recommended that the emitter cleaning kit (IZT44-M3) is used to clean the emitter needles.
 - a. Before cleaning the emitters, shutoff the power supply.
 - b. Place the cleaning kit on the bar so that the brush touches the emitter and move it along the groove to clean it.

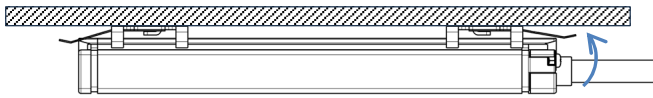


- If you do not have a cleaning kit, an alcohol saturated cotton ball can be used for cleaning the electrodes. Use caution to prevent damage to the electrode needles.
- The alcohol used should be reagent ethanol class 1 99.5vol% or more.

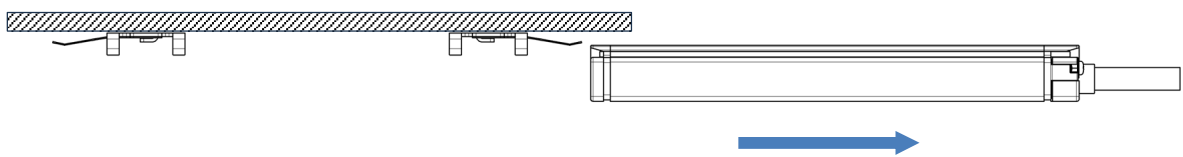
Bar Replacement

- If ionization is still not possible after cleaning the emitter, the emitter may be worn or damaged. If this is the case, replace the bar according to the following procedure.

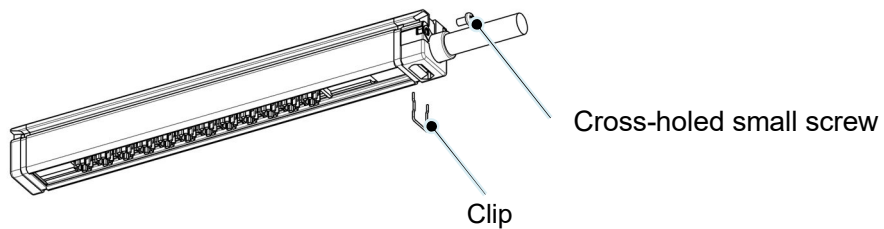
(1) Raise the lever on the end bracket.



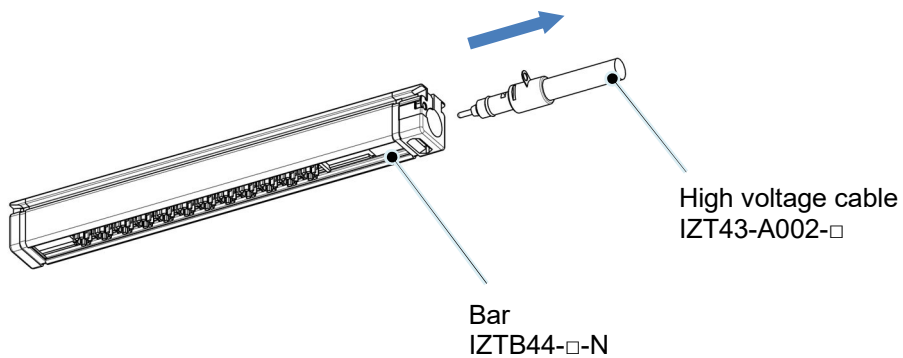
(2) Slide the bar out.



(3) Remove the clip and the cross-holed small screw from the bar.



(4) Disconnect the high voltage cable.



- For installation, reverse the above steps.

Tightening torque for small screws with cross holes during installation 0.3 to 0.4Nm

Revision history

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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