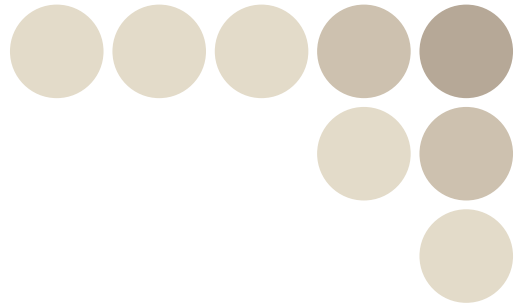


## Ionizer

ZJ-BA Series

Bar Type



## User's Manual



# Introduction

---

Thank you for purchasing the ZJ-BA.

This manual provides information regarding functions, performance and operating methods that are required for using the ZJ-BA.

When using the ZJ-BA, be sure to observe the following:

- The ZJ-BA must be operated by personnel knowledgeable in electrical engineering.
- To ensure correct use, please read this manual thoroughly to deepen your understanding of the product.
- Please keep this manual in a safe place so that it can be referred to whenever necessary.

Introduction	APPLICATION CONSIDERATIONS (Please Read)	Introduction
Section 1	OVERVIEW	Section 1
Section 2	INSTALLATION & CONNECTION	Section 2
Section 3	SETUP	Section 3
Section 4	MAINTENANCE	Section 4
Section 5	APPENDIX	Section 5

# User's Manual

Ionizer

ZJ-BA Series

**READ AND UNDERSTAND THIS DOCUMENT**

Please read and understand this document before using the products. Please consult your OMRON representative if you have any questions or comments.

**WARRANTY**

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

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OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

## **SUITABILITY FOR USE**

THE PRODUCTS CONTAINED IN THIS DOCUMENT ARE NOT SAFETY RATED. THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PERSONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMPONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES.

Please refer to separate catalogs for OMRON's safety rated products.

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the product.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

## **PERFORMANCE DATA**

Performance data given in this document is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

## **CHANGE IN SPECIFICATIONS**

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the product may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

**DIMENSIONS AND WEIGHTS**

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

**ERRORS AND OMISSIONS**

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

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## Meanings of Signal Words

The following signal words are used in this manual.



Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

## Meanings of Alert Symbols

The following alert symbols are used in this manual.



Indicates the possibility of fire under specific conditions.



Indicates general mandatory action precautions for which there is no specified symbol.

## Alert Statements in this Manual

The following alert statements apply to the products in this manual. Each alert statement also appears at the locations needed in this manual to attract your attention.



When screw-fastening the body for use by the mounting bracket, vibration or the body's own weight may cause it to fall, and cause an injury if the screws are not sufficiently tightened.

Mount the body using M4 screws tightened to a tightening torque of 1.2 N•m.



Water droplets entering the body and coming into contact with the electrical circuit may cause the circuit to ignite.

Do not use the product in locations subjected to condensation or in highly humid atmospheres.



## Precautions for Safe Use

Please observe the following precautions for safe use of the product.

### 1. Installation Environment

- Do not use the product in environments where it can be exposed to inflammable/explosive gas.
- Do not install the product close to high-voltage devices and power devices in order to secure the safety of operation and maintenance.

### 2. Power Supply and Wiring

- Use the power supply within the specified voltage range.
- The output load should not be short-circuited.
- High-voltage lines and power lines must be wired separately from this product. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
- Avoid connecting or disconnecting connectors while the product is powered on. Doing so may damage the product.

### 3. Others

- Use only the specified types of batteries for the exclusive remote control.  
Also, before using the remote control, be sure to thoroughly read the precautions provided by the manufacturer to ensure correct use.
- Do not disassemble, repair, or modify this product.
- Dispose of this product as industrial waste.



## Precautions for Correct Use

Please observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on product performance.

### 1. Installation Site

Do not install this product in locations subjected to the following conditions:

- Ambient temperature outside the rating
- Ambient humidity outside the rating
- Presence of corrosive or flammable gases
- Presence of dust, salt, or iron particles
- Direct vibration or shock
- Direct sunlight
- Water, oil, or chemical fumes or spray
- Strong magnetic or electric field
- Devices (e.g. precision equipment) susceptible to the influence of peripheral noise

### 2. Power Supply and Wiring

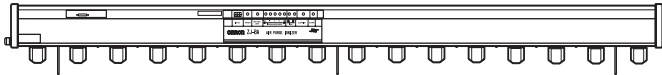
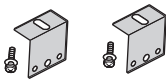

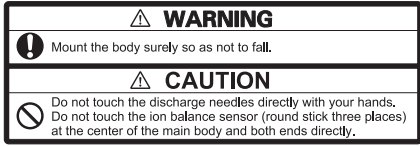
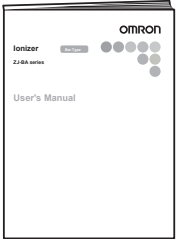
- Be sure to use the exclusive power supply (AC adapter type, high-output type or DC input type). Also, use the exclusive modular cable for wiring the exclusive power supply to the ionizer.
- The maximum number of ionizers that can be connected to each of the exclusive power supplies is already determined. Be sure to observe these limitations.
- When using an exclusive power supply (DC input type)
  - When connecting the DC24V input terminals, pay attention to the polarity of the terminals. The supply voltage must be within the rated range.
  - Do not ground the DC24V terminal.
- If surge currents are present in the power lines, connect surge absorbers that suit the operating environment.
- When connecting the I/O signal lines, pay attention to the polarity of the lines. The supply voltage and current must be within the rated ranges.

### 3. Maintenance and Inspection

- Periodically clean the discharge needles as dirt on these needles causes the amount of generated ions to fall or the ion balance to deviate.
- Before cleaning or removing/installing discharge needles, be sure to turn the power off.
- Do not touch the discharge needles directly with your hands.
- Use alcohol for cleaning the discharge needles.  
Do not use paint thinner, benzene, acetone or kerosene.
- Do not directly touch the ion balance sensors (3 at center and at both sides) of the body.

# Checking the Contents of the Package

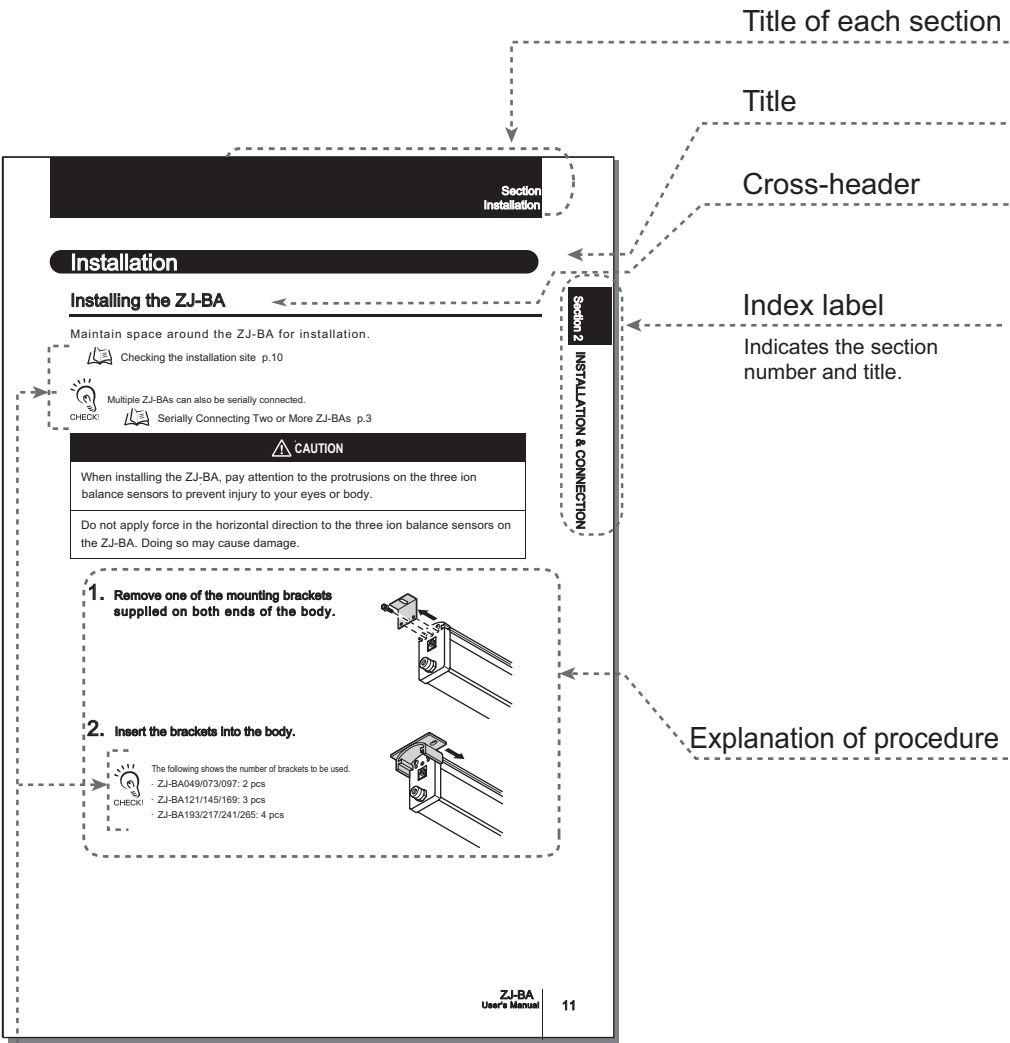
The ZJ-BA package contains the following items. Before you start using the ZJ-BA, make sure that the package contains all of these items.

Body	
Mounting bracket (with M4 screws): 2 pcs	
Bracket (without screws) • 2 pcs: BA049/BA073/BA097 • 3 pcs: BA121/BA145/BA169 • 4 pcs: BA193/BA217/BA265	
Warning label (English): 1 (*1)	
User's Manual (this document) (1 pc)	

\*1: Reattach the warning label as necessary.  
Re-attach the warning label over the label (Japanese) on the right edge of the body.

# Editor's Note

## Page Format



### Supplementary

Helpful information regarding operation and reference pages are introduced here using symbols.



\* This page has been made purely for explanatory purposes and does not exist.

## ■ Meaning of Symbols

Menu items that are displayed on the remote control's LCD screen are indicated enclosed by brackets "[ ]".

## ■ Visual Aids



Indicates points that are important to ensure full product performance, such as operational precautions and application procedures.

CHECK! (upper row: when used in text descriptions other than tables)

**CHECK!** (lower row: when used in tables)



Indicates pages where related information can be found.



Indicates information helpful in operation.

# CONTENTS

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Meanings of Alert Symbols	v
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MEMO



# Section 1

## OVERVIEW

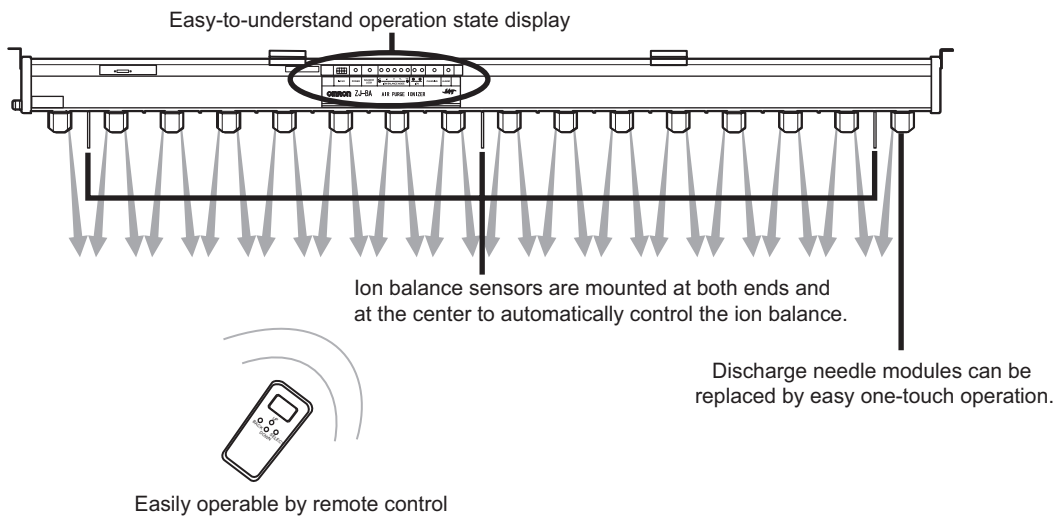
 ZJ-BA Features	2
 Basic Configuration	3
 Part Names and Functions	5
ZJ-BA Body	5
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## ZJ-BA Features

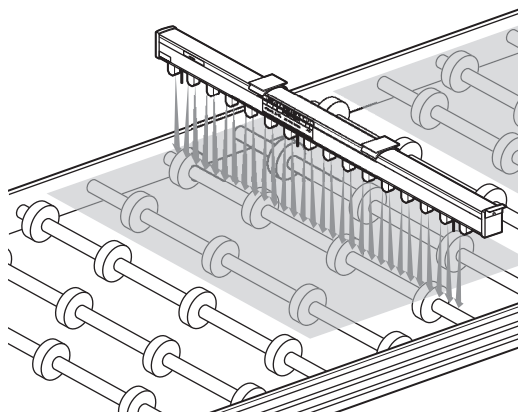
The ZJ-BA ionizer (static eliminator) is capable of eliminating static electricity in a wide range at high speed.

It adopts a dual mixing variable DC system to achieve outstanding ion balance.

It also incorporates three ion balance modes: Zero Balance mode, Positive mode, and Negative mode. Static electricity can be eliminated at a higher speed by selecting the appropriate mode matched to the charged amount of the workpiece.

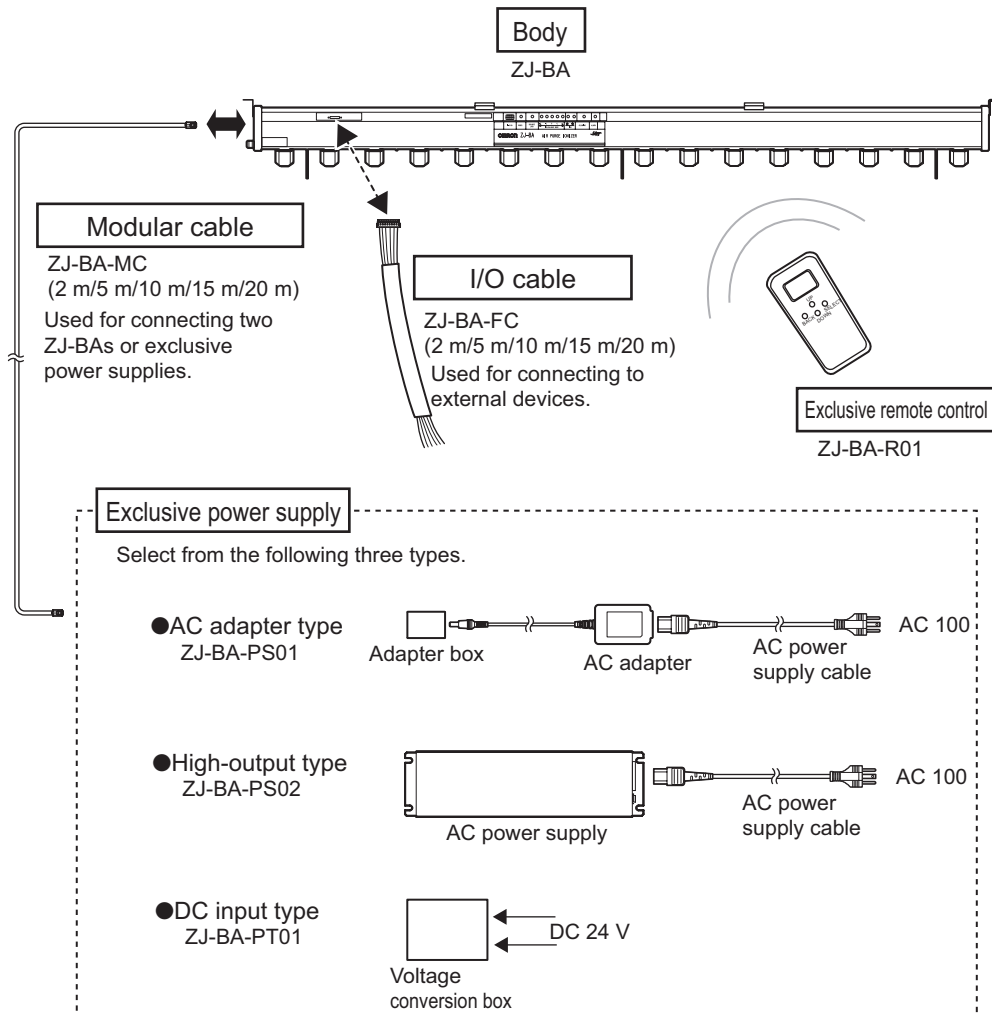


### ● Ionizing when Feeding LCD Panels



# Basic Configuration

The basic configuration changes according to the type of power supply used.



The number of connectable units changes according to the type of power supply.



Number of Connectable Units by Exclusive Power Supply p.4

## ■ Number of Connectable Units by Exclusive Power Supply

The maximum length of the modular cable differs according to how the ionizer is connected.

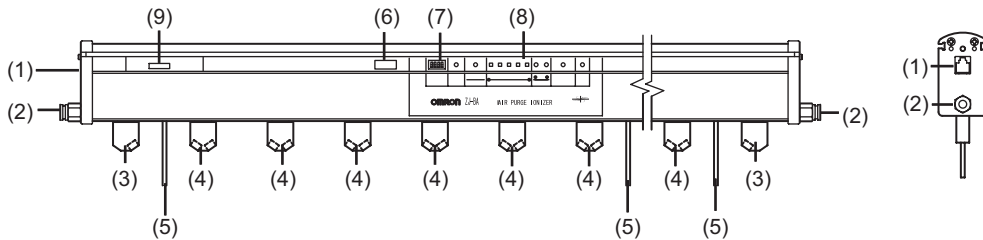
Type	Number of Connectable Units	Connection Example
AC adapter type ZJ-BA-PS01	2 units	<p>AC adapter Adapter box</p> <p>AC power supply cable</p> <p>20 m (max)</p> <p>Modular cable</p> <p>ZJ-BA</p>
		<p>AC adapter Adapter box</p> <p>AC power supply cable</p> <p>10 m (max)</p> <p>10 m (max)</p> <p>ZJ-BA</p> <p>ZJ-BA</p>
High-output type ZJ-BA-PS02	8 units	<p>AC power supply</p> <p>AC power supply cable</p> <p>10 m (max)</p> <p>10 m (max)</p> <p>ZJ-BA</p> <p>ZJ-BA</p>
		<p>* Up to three ZJ-BAs can be connected to a single modular connector.</p> <p>AC power supply</p> <p>AC power supply cable</p> <p>6 m (max)</p> <p>6 m (max)</p> <p>6 m (max)</p> <p>ZJ-BA</p> <p>ZJ-BA</p> <p>ZJ-BA</p>
DC input type ZJ-BA-PT01	2 units	<p>Voltage conversion box</p> <p>DC 24 V 0.78 A</p> <p>20 m (max)</p> <p>ZJ-BA</p>
		<p>Voltage conversion box</p> <p>DC 24 V 0.78 A</p> <p>10 m (max)</p> <p>10 m (max)</p> <p>ZJ-BA</p> <p>ZJ-BA</p>

## Part Names and Functions

This section describes the names and functions of parts on the ZJ-BA.

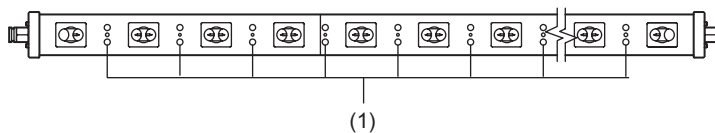
### ZJ-BA Body

#### ■ Front/side



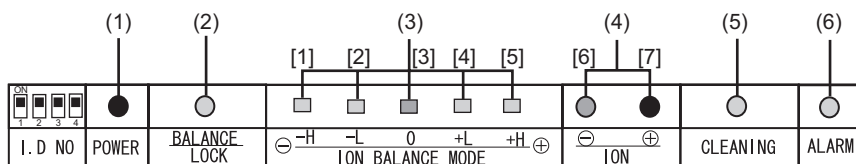
Name	Function
(1) Power connector	For connecting to the exclusive power supply by the modular cable
(2) Air intake duct	A 6 mm dia. air tube is connected to allow air in. <b>(CHECK!)</b> This duct is provided on only one side of the JZ-BA049/073/097.
(3) Discharge needle modules (single-pole specification)	A high voltage is applied to the tips of these needles, and ions are discharged from only one side by corona discharge.
(4) Discharge needle modules (both-pole specification)	A high voltage is applied to the tips of these needles, and ions are discharged from both sides by corona discharge.
(5) Ion balance sensor	This sensor maintains a constant balance between plus ions and minus ions.
(6) Group No. display	Indicates the group No.
(7) DIP switch	Sets the ID No. of the body.
(8) Operation indicator panel	Indicates the operating state of the body and function settings.
(9) I/O cable connector	This connector is for connecting the I/O cable.

#### ■ Bottom



Name	Function
(1) Air spray hole	Plus/minus ions are sprayed onto the charged object from this hole.

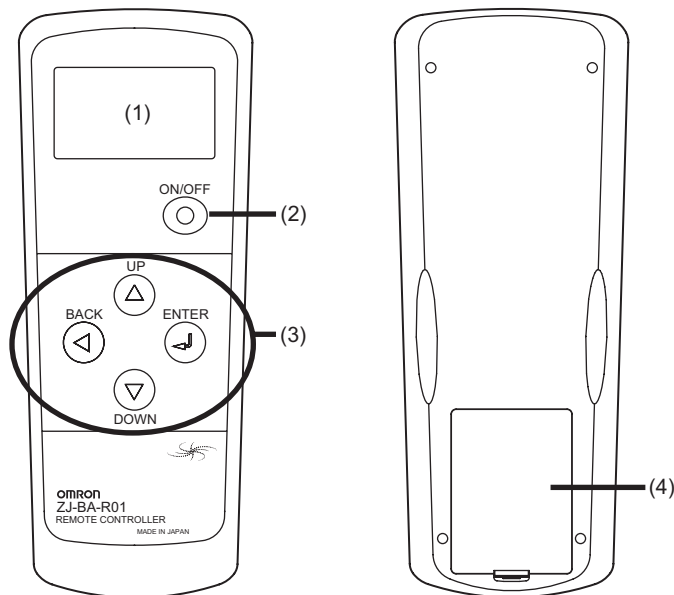
## ■ Operation indicator panel




Panel Indication	LED Lighting Color	Functions
(1) POWER	Red	Lights when the ionizer is powered on.
(2) BALANCE LOCK	Red	<p>Lights when the body is locked.</p> <p> p.32</p> <p><b>(CHECK!)</b></p> <ul style="list-style-type: none"> <li>• This indicator is lit as the default setting is locked.</li> <li>• This indicator lights momentarily when a wireless signal from the remote control is received.</li> </ul>
(3) ION BALANCE MODE	The currently selected ion balance mode lights in five stages. Only the mode in question lights.	<p>[1] -H: Red Lights when the Negative High mode is selected.</p> <p>[2] -L: Orange Lights when the Negative Low mode is selected.</p> <p>[3] 0: Green Lights when the Zero Balance mode is selected.</p> <p>[4] +L: Orange Lights when the Positive Low mode is selected.</p> <p>[5] +H: Red Lights when the Positive High mode is selected.</p>
(4) ION OUTPUT	Indicates that ions of both polarity are being emitted. <b>(CHECK!)</b> When this LED is out, ions are not being emitted.	<p>[6] -: Green Lights when minus ions are being generated.</p> <p>[7] +: Red Lights when plus ions are being generated.</p>
(5) CLEANING	Red	<p>Lights when the discharge needles are dirty, which causes a drop in ion output.</p> <p><b>(CHECK!)</b></p> <ul style="list-style-type: none"> <li>• This LED is enabled only when the panel indicates the Zero Balance mode.</li> <li>• This LED indicator also lights together with the ALARM LED when it is lit.</li> </ul>
(6) ALARM	Red	<p>This LED lights when an error occurs. Ion output stops when this LED is lit.</p> <p> p.31</p>

## Remote Control

### ■ Front and rear






Name	Function
(1) LCD display	Displays the menu.  Menu hierarchy p.23
(2) Power supply switch	Turns the remote control ON/OFF.
(3) Control keys	The UP, DOWN, BACK, and ENTER keys select menus, and are used for settings and operations.
(4) Battery compartment	Holds three AAA batteries. <b>(CHECK)</b> Replace the batteries when the LCD screen of the remote control is not displaying or functioning correctly.

MEMO



## Section 2

# INSTALLATION & CONNECTION

 Before Installation and Connection	10
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## Before Installation and Connection

### Precautions for the Installation Site

#### ■ Checking the installation environment

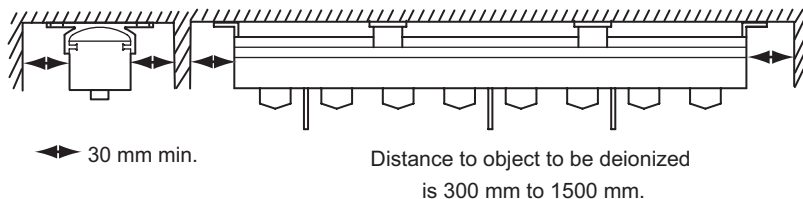
Read "Precautions for Safe Use" at the beginning of this manual, and check the installation environment.

#### ■ Checking the installation site

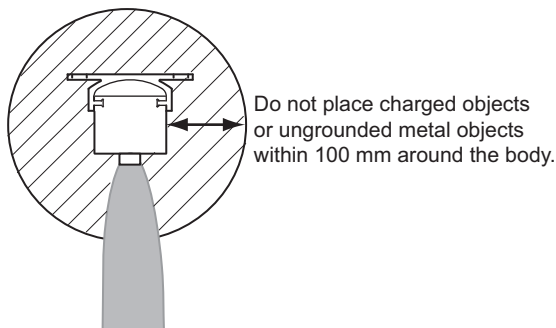
Read "Precautions for Correct Use" at the beginning of this manual, and check the installation site.

#### ■ Installation site and installation distance

- When installing the body on a wall or similar surface, allow at least 30 mm between the body and the installation surface.
- We recommend 300 mm to 1500 mm of space between the body and the object to be deionized. Plus ions and minus ions are simultaneously emitted in this range to uniformly deionize the object.



- Do not place charged objects within about 100 mm around the body (excluding the ion spray position). Otherwise, the performance of the ZJ-BA may be adversely affected.




- Ground ungrounded metal objects.
- Other ionizers used near to the ZJ-BA may adversely affect deionizing performance.
- Prevent metal from contacting metal parts on the side and bottom of the body, and the sensor electrodes. Failure to do so might adversely affect deionizing performance.

# Installation

## Installing the ZJ-BA

Maintain space around the body for installation.

 Checking the installation site p.10



Multiple ZJ-BAs can also be serially connected.



Serially Connecting Two or More ZJ-BAs p.4, p.17

### CAUTION

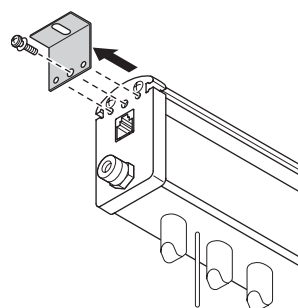
When installing the ZJ-BA, pay attention to the protrusions on the three ion balance sensors to prevent injury to your eyes or body.



Do not apply force in the horizontal direction to the three ion balance sensors on the ZJ-BA. Doing so may cause damage.



1. Remove one of the mounting brackets supplied on both ends of the body.



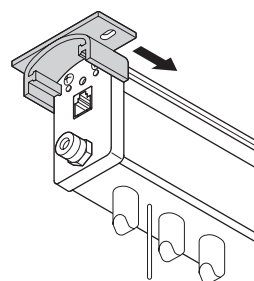
2. Insert the brackets into the body.



The following shows the number of supplied brackets:

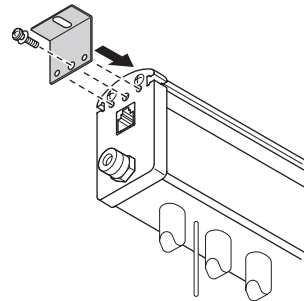
- ZJ-BA049/073/097: 2 pcs
- ZJ-BA121/145/169: 3 pcs
- ZJ-BA193/217/241/265: 4 pcs

Position the brackets at equal distances along the body.



- 3.** Install the mounting bracket you removed onto the body.

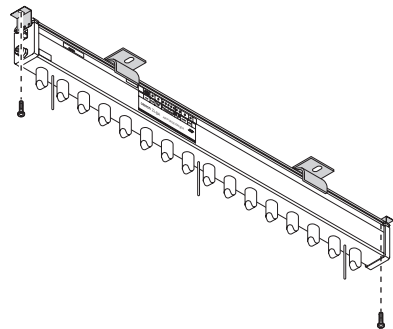
Screws: M4 x 2



- 4.** Fix the mounting bracket at the installation site using the M4 screws.

Screws: M4 x 2

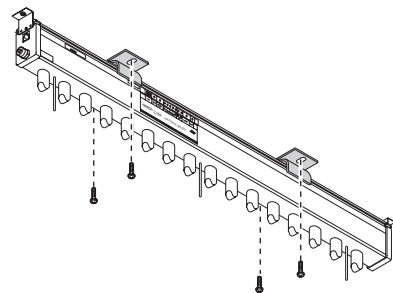
Tightening torque: 1.2 N•m



- 5.** Fix the bracket using M4 screws.

Screws: M4 x 2 per bracket

Tightening torque: 1.2 N•m



# Connection

## Connecting the Air Tube



Before connecting/disconnecting peripheral devices, make sure that the power supply is turned off. The ionizer may break down if it is connected or disconnected while the power is on.

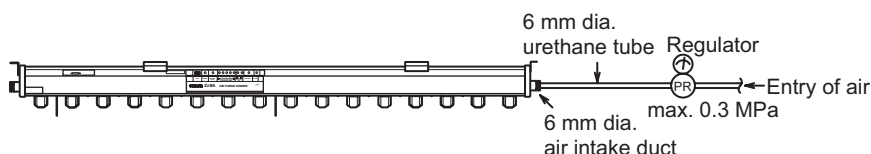
CHECK!

Relationship between length of body and air flow rate

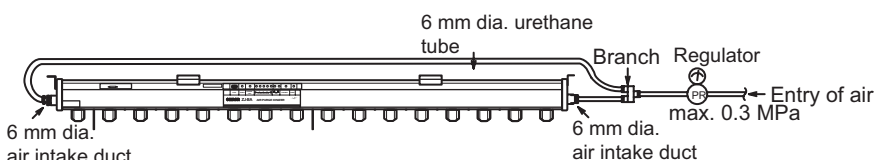
Model	Total flow rate (L/min)	Model	Total flow rate (L/min)
ZJ-BA049	14	ZJ-BA169	54
ZJ-BA073	22	ZJ-BA193	62
ZJ-BA097	30	ZJ-BA217	70
ZJ-BA121	38	ZJ-BA241	78
ZJ-BA145	46	ZJ-BA265	86

### 1. Connect the air tube to the air intake duct on the body.

ZJ-BA049/ZJ-BA073/ZJ-BA097



Models other than the above



### 2. Allow air to flow.



CHECK!

- Use air of maximum air pressure 0.3 MPa (3 kg/cm<sup>2</sup>). An air pressure exceeding this may damage the body.
- Be sure to use dry air that has passed through an air dryer.

## Connecting the Power Supply

Read "Precautions for Safe Use" at the beginning of this manual, and check the installation environment.

The connection method changes according to the type of power supply to be used.



Basic Configuration p.3, List of Accessories p.55

Deionization is started when the power supply is connected.



CHECK!

Before connecting/disconnecting peripheral devices, make sure that the power supply is turned off.

The ionizer may break down if it is connected or disconnected while the power is on.

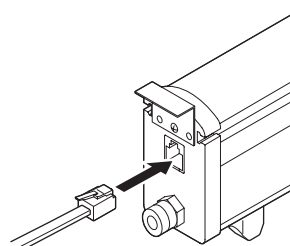
### ■ AC adapter type/high-output type power supplies



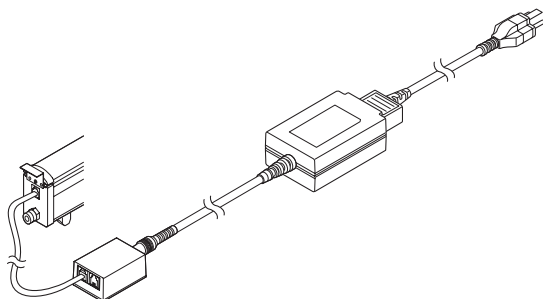
CHECK!

- Be sure to connect the AC power supply to a grounded 3-pin power supply.
- Exclusive power supply (high-output type): Turn the POWER switch on the AC power supply off beforehand.

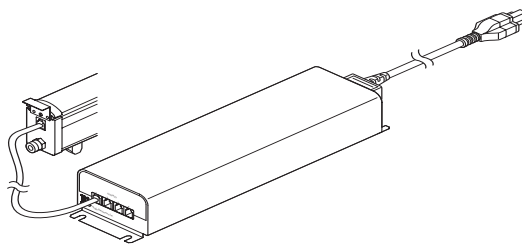
1. Connect the modular cable to the power connector on the body.



2. Connect the exclusive power supply to the modular cable.



[AC adapter type]

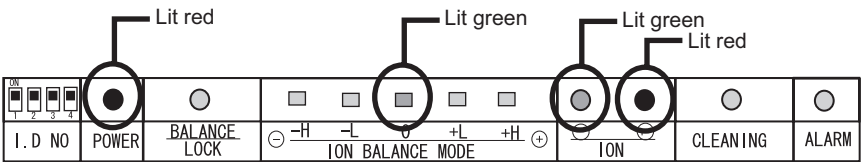


[High-output type]

- 3.** Connect the exclusive power supply to the power supply.  
After connecting the high-output type exclusive power supply, set the power switch to ON.

This starts deionizing.

- 4.** Check the lit state of the LEDs on the operation indicator panel.



- 5.** Adjust the pressure so that air reaches the object to be deionized.

The ZJ-BA is then ready for use.



CHECK!

- Be sure to use dry air that has passed through an air dryer.
- The maximum air pressure is 0.3 MPa (3 kg/cm<sup>2</sup>).

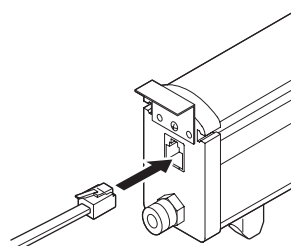
## ■ DC input type power supply

Connect the voltage conversion box to the DC 24 V power supply.

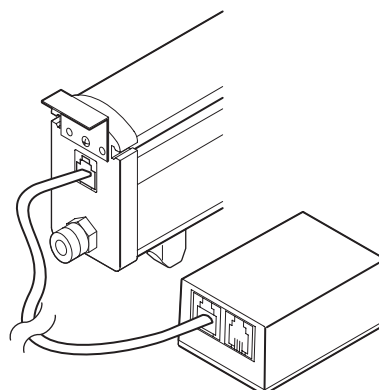


When serially connecting multiple voltage conversion boxes, calculate the minimum current of each voltage conversion box as being 0.8 A.

1. **Connect the modular cable to the power connector on the body.**



2. **Connect the voltage conversion box to the modular cable.**



3. **Connect the voltage conversion box to the DC 24 V power supply.**

Wire with the power supply off.



Be sure to ground the ground terminal of the voltage conversion box.

4. **Turn the power supply on.**

This starts deionizing.



Procedures from here on are the same as steps 4 and 5 of "■ AC adapter type/high-output type power supplies."



p.15



## Serially Connecting Two or More ZJ-BAs

When connecting two or more ZJ-BAs, insert the modular cable into the power connector.

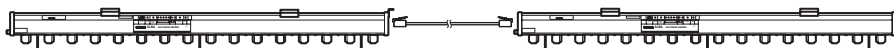


Basic Configuration p.3



CHECK!

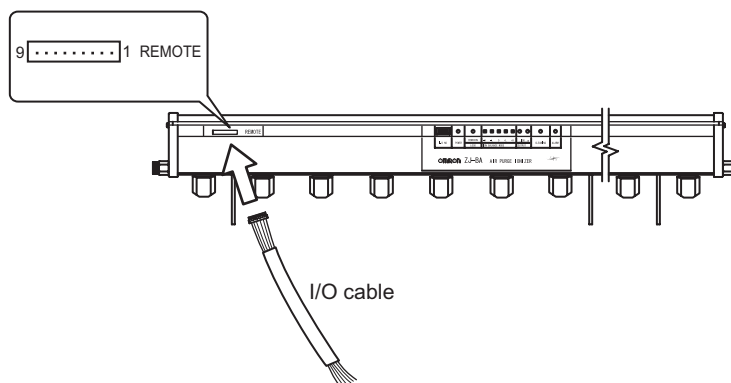
Wire with the power supply off.



## Connecting the I/O Cable

Connect the I/O cable.

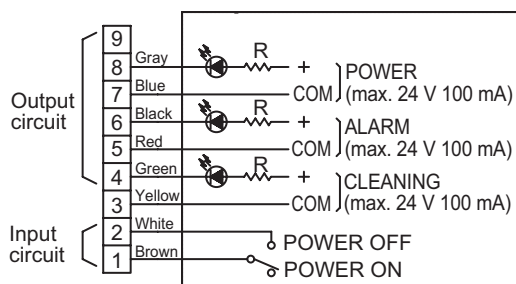
Connect/disconnect with the power supply off.



Wiring the I/O cable

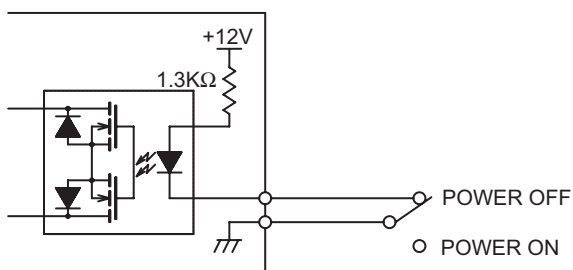
Connector Pin No.	Cable Lead Color	Name	Function
1	Brown	Power ON/OFF input	Turn the ZJ-BA on/off.
2	White		When shorted across pins 1 and 2: Power off When pins are open: Power on
3	Yellow	Cleaning output	Turns on when the discharge needles are dirty, which causes a drop in ion output.
4	Green		
5	Red	Alarm output	Turns on when an error has occurred on the ZJ-BA.
6	Black		
7	Blue	Power output	Turns on when the ZJ-BA is turned on.
8	Gray		

## ■ Example of external circuit



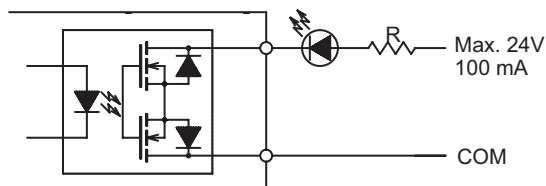
Power is off when the white and brown leads are short-circuited.

## ■ Input circuit diagram






Power is off when the white and brown leads are short-circuited.

## ■ Output circuit diagram



# Section 3

## SETUP

 ID No. Setting	20
 Basic Knowledge for Operation	21
Features of the Remote Control	21
Reading Menus and Key Operations	22
 Settings	24
Selecting the Group No. of the ZJ-BA to be Operated	24
Selecting the ID No. of the ZJ-BA to be Operated	25
Selecting the Ion Balance Mode	26
Fine-adjusting the Zero Balance	28
Turning the ZJ-BA On/Off	30
Resetting the Alarm	31
Storing Ion Balance Setting Values to Memory	32
Restoring Default Settings	33

## ID No. Setting

When multiple ZJ-BAs are used, set an ID No. to each ZJ-BA so that they can be recognized. 16 ID Nos. can be set within the range 0 to 15. The default setting is "0".

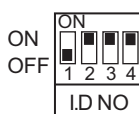


ZJ-BAs are identified by a combination of group No. and ID No.  
Setting Group Nos. p.24

### 1. Set the ID No. by the DIP switches on the body.

Set the ID No. within the range 0 to 15 by switching the DIP switch ON/OFF settings.

Example: When ID No. is "1"



0: ON 1: OFF

I.D	Bit1	Bit2	Bit3	Bit4
0	0	0	0	0
1	1	0	0	0
2	0	1	0	0
3	1	1	0	0
4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1
10	0	1	0	1
11	1	1	0	1
12	0	0	1	1
13	1	0	1	1
14	0	1	1	1
15	1	1	1	1

### 2. When an ID No. has been set again, turn the power off then back on again.









## Basic Knowledge for Operation

The ZJ-BA is operated by the exclusive remote control.

The following describes settings and operations made using the exclusive remote control, and the menu hierarchy.

### Features of the Remote Control

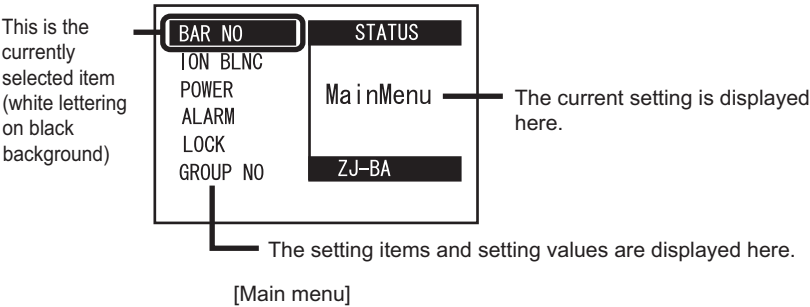
The remote control can be used to perform the following settings and operations.

- Selection of the group No. of the ZJ-BA to be operated by the remote control  p.24
- Selection of the ID No. of the ZJ-BA to be operated by the remote control  p.25
- Selection of the ion balance mode  p.26
- Fine-adjustment of zero balance  p.28
- ZJ-BA on/off  p.30
- Alarm reset  p.31
- Storage of ion balance setting values  p.32
- Restoration of default settings  p.33

# Reading Menus and Key Operations

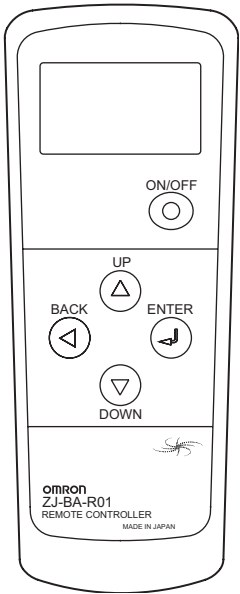
## ■ Reading menus

The main menu is displayed when the power supply switch on the remote control is turned on.



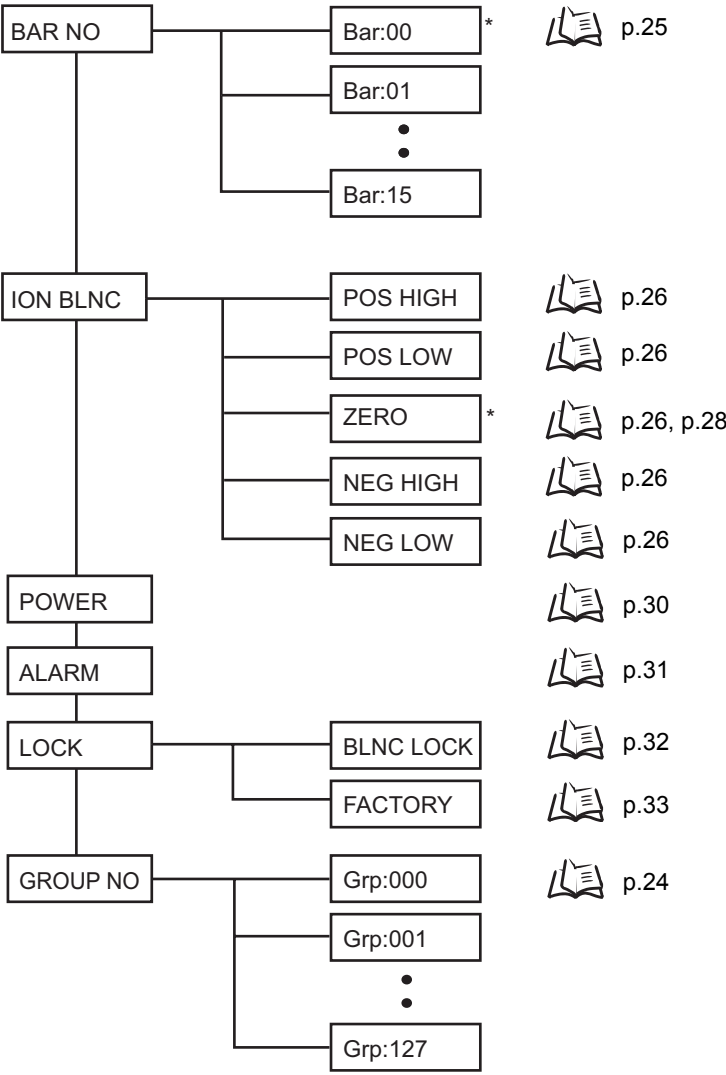
## ■ Key operations

Setting items and setting values in the main menu are selected and applied by pressing the keys on the remote control.



Key	Function
UP	<ul style="list-style-type: none"><li>• Moves the cursor up one item and applies candidates. (During fine-adjustment of zero balance)</li><li>• Raises the voltage by about 1 V.</li></ul>
DOWN	<ul style="list-style-type: none"><li>• Moves the cursor down one field and applies candidates. (During fine-adjustment of zero balance)</li><li>• Lowers the voltage by about 1 V.</li></ul>
ENTER	Selects and applies candidates.
BACK	Returns one layer up in the menu hierarchy.

■ Menu hierarchy




\*: Default setting

## Settings

### Selecting the Group No. of the ZJ-BA to be Operated

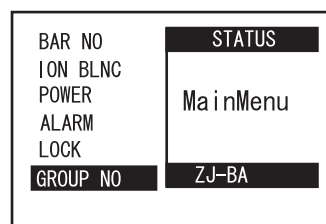
The group No. (0 to 127) is set before shipment, and is indicated on the sticker on the front of the body. Specify the group No. of the ZJ-BA to be controlled by the remote control. The group No. and ID No. are for preventing changes to the setting values of ZJ-BAs not intended to be controlled by remote control operation when multiple ZJ-BAs are used near the remote control.

Before you start operating a ZB-JA, specify the group No. on the remote control.

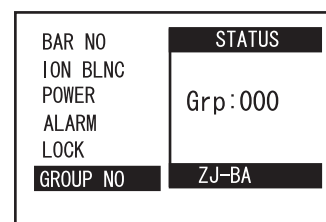
 Group No. display p.5

Setting value: Grp:000 to Grp:127

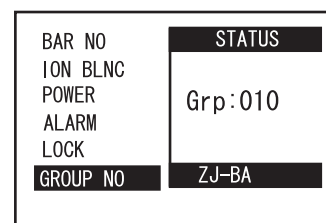
1. Select [GROUP NO] in the main menu using the UP or DOWN key.



2. Press the ENTER key.  
[Grp:XXX] is displayed.



3. Press the UP or DOWN key to specify the group No. indicated on the group No. sticker on the body.



[When group No.10 is specified]

4. Press the ENTER key.  
The control signal is sent to the ZJ-BA from the remote control, and the "BALANCE LOCK" LED on the body lights momentarily.
5. Press the BACK key.  
The display returns to the main menu.



## Selecting the ID No. of the ZJ-BA to be Operated

Select the ID No. currently set by the DIP switches on the body.

Setting value: Bar:00 to Bar:15



CHECK!

Before you perform this operation, set the group No. When the group No. is set incorrectly, the ID No. cannot be set and the remote control cannot be operated.



Selecting the Group No. of the ZJ-BA to be Operated p.24

1. Select [BAR NO] in the main menu using the UP or DOWN key.

BAR NO	STATUS
ION BLNC	MainMenu
POWER	
ALARM	
LOCK	
GROUP NO	ZJ-BA

2. Press the ENTER key.

The setting value is displayed.

[Bar:XX] is displayed.

BAR NO	STATUS
ION BLNC	Bar : 00
POWER	
ALARM	
LOCK	
GROUP NO	ZJ-BA

3. Press the UP or DOWN key to bring the cursor to the ID No. set by the DIP switch on the body.

The selected No. is displayed to the side of [Bar:].

Numbers within the range 0 to 15 can be selected.

BAR NO	STATUS
ION BLNC	Bar : 08
POWER	
ALARM	
LOCK	
GROUP NO	ZJ-BA

[When ID8 is specified]

4. Press the ENTER key.

The control signal is sent to the ZJ-BA from the remote control, and the "BALANCE LOCK" LED on the body lights momentarily.

## Selecting the Ion Balance Mode

Select the optimum mode from among the five ion balance modes.

Normally, use the ZJ-BA at the zero balance mode (default).

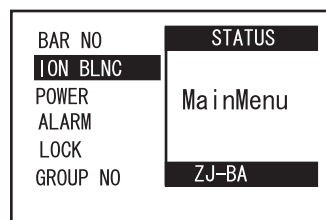


If you know the polarity to charge beforehand, you can set either of Positive mode or Negative mode, and deionize more quickly by sending lots of ions opposite to those of the charged object. In this case, the ion balance may be disrupted.

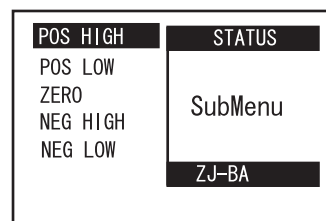
Setting Value	Description
POS HIGH	More plus ions are sprayed than minus ions.
POS LOW	Select this mode if you know beforehand that the workpiece is minus-charged. [POS HIGH] sprays more plus ions than [POS LOW].
ZERO	The three ion balance sensors control the amount of generated plus/minus ions to maintain a constant ion balance. The amount of generated ions can be fine-adjusted. The default setting is [ZERO].
NEG HIGH	More minus ions are sprayed than plus ions.
NEG LOW	Select this mode if you know beforehand that the workpiece is plus-charged. [NEG HIGH] sprays more minus ions than [NEG LOW].

The following describes an example of setting the Positive Low mode.

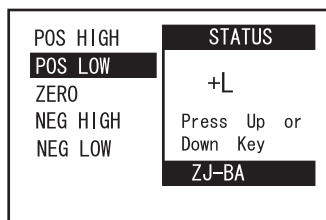
1. Select [ION BLNC] in the main menu using the UP or DOWN key.



2. Press the ENTER key.  
The setting value is displayed.



3. Select [POS LOW] using the UP or DOWN key, and press the ENTER key.  
[+L] is displayed.  
The screen display differs according to the selected details.



**4. Press the UP or DOWN key to apply the setting value.**

The signal transmission mark is displayed, and the "+L" LED of "ION BALANCE MODE" on the body lights.

POS HIGH	STATUS
POS LOW	+L
ZERO	
NEG HIGH	
NEG LOW	
	ZJ-BA



When the Zero Balance mode [ZERO] is selected, fine-adjust the zero balance by the UP or DOWN key.

CHECK!



Fine-adjusting Zero Balance p.28

**5. Press the BACK key.**

The display returns to the main menu.

## Fine-adjusting the Zero Balance

When the Zero Balance mode is set, the balance between plus ions and minus ions can be fine-adjusted in approximately 1 V increments.



For fine-adjusting the ion balance, prepare the charging plate monitor to measure the ion balance.

CHECK!

1. Select [ION BLNC] in the main menu using the UP or DOWN key.

BAR NO	STATUS
<b>ION BLNC</b>	MainMenu
POWER	
ALARM	
LOCK	
GROUP NO	ZJ-BA

2. Press the ENTER key.  
The setting value is displayed.

<b>POS HIGH</b>	STATUS
POS LOW	SubMenu
ZERO	
NEG HIGH	
NEG LOW	ZJ-BA

3. Select [ZERO] using the UP or DOWN key, and press the ENTER key. Next, press the UP or DOWN key to apply the setting.

The control signal is sent to the ZJ-BA from the remote control, and the "0 (zero balance)" LED at "ION BALANCE MODE" on the body lights.

POS HIGH	STATUS
POS LOW	Zero
<b>ZERO</b>	↑↓:
NEG HIGH	
NEG LOW	ZJ-BA

4. Adjust the ion balance.

Approx. 1 V adjustment in plus direction: UP key

Approx. 1 V adjustment in minus direction: DOWN key

The signal transmission mark is displayed.

POS HIGH	STATUS
POS LOW	Zero
<b>ZERO</b>	↑:
NEG HIGH	
NEG LOW	ZJ-BA

[When the UP key is pressed]

POS HIGH	STATUS
POS LOW	Zero
<b>ZERO</b>	↓:
NEG HIGH	
NEG LOW	ZJ-BA

[When the DOWN key is pressed]

## 5. Press the BACK key twice.

The display returns to the main menu.



After adjusting the zero balance, be sure to perform balance lock.

Otherwise, the state that was active before the zero balance was adjusted will be returned to when the power is turned off.



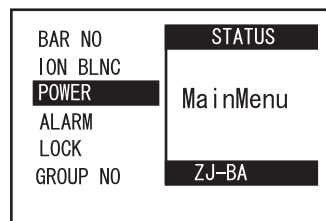
Setting the balance lock p.32

## Turning the ZJ-BA On/Off

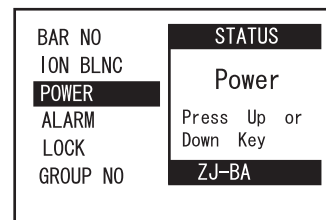
The ZJ-BA can be turned on/off by the remote control.

Each press of the UP or DOWN key sends the control signal to the ZJ-BA from the remote control to switch the ZJ-BA on/off.

1. Select [POWER] in the main menu using the UP or DOWN key.

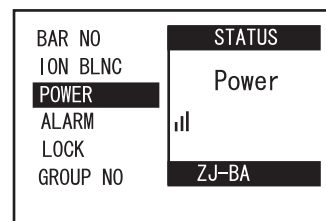


2. Press the ENTER key.  
[Power] is displayed.



3. Press the UP or DOWN key.

The signal transmission mark is displayed, and the ZJ-BA is turned on/off.



CHECK!

The "POWER" LED on the body lights when the ZJ-BA is on and is out when the ZJ-BA is off.

4. Press the BACK key.

The display returns to the main menu.

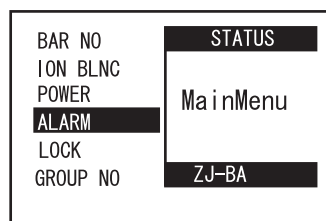
## Resetting the Alarm

Resetting the alarm involves turning the "ALARM" LED on the ZJ-BA off.

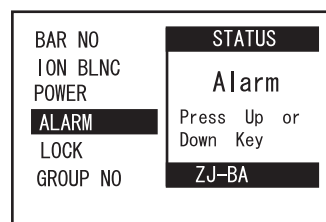
This operation, however, does remove the cause of the alarm. When an alarm is displayed, see "Troubleshooting" to remedy the trouble.

 Troubleshooting p.44

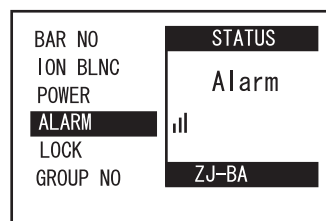
1. Select [ALARM] in the main menu using the UP or DOWN key.



2. Press the ENTER key.  
[Alarm] is displayed.



3. Press the UP or DOWN key.  
The signal transmission mark is displayed, and the "ALARM" LED on the body goes out.



4. Press the BACK key.  
The display returns to the main menu.

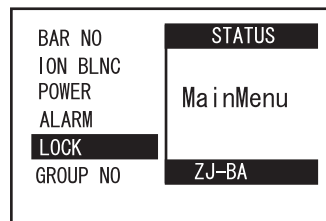
## Storing Ion Balance Setting Values to Memory

Store the ion balance setting values to memory to prevent them from being lost even if the ZJ-BA is turned off.

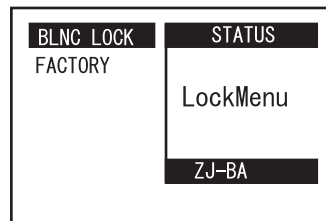
Store the following setting values to memory:

- Ion balance modes
- Zero balance adjustment values

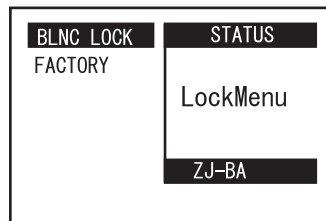
1. Select [LOCK] in the main menu using the UP or DOWN key.



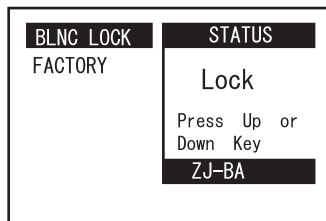
2. Press the ENTER key.  
The setting value is displayed.



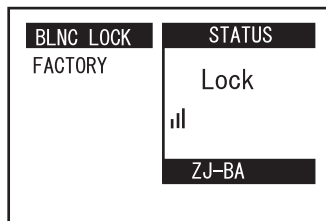
3. Select [BLNC LOCK] using the UP or DOWN key.



4. Press the ENTER key.  
[Lock] is displayed.



5. Press the UP or DOWN key.  
The signal transmission mark is displayed, and the "BALANCE LOCK" LED on the body lights.



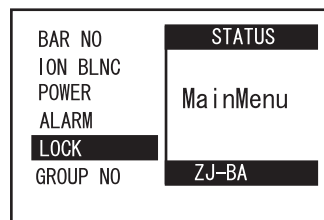
6. Press the BACK key twice.  
The display returns to the main menu.



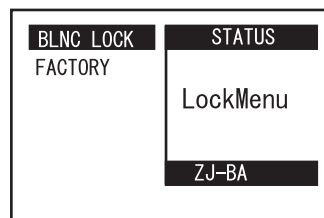
## Restoring Default Settings

The ZJ-BA settings can be restored to their defaults.

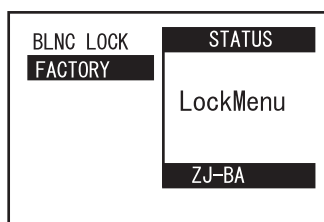
1. Select [LOCK] in the main menu using the UP or DOWN key.



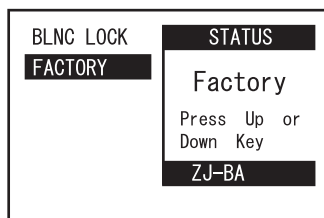
2. Press the ENTER key.  
The setting value is displayed.



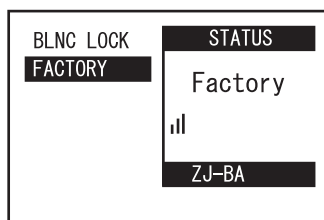
3. Select [FACTORY] using the UP or DOWN key.



4. Press the ENTER key.  
[Factory] is displayed.



5. Press the UP or DOWN key.  
The signal transmission mark is displayed, and the "BALANCE LOCK" LED on the body lights.





6. Press the BACK key twice.  
The display returns to the main menu.

MEMO

# Section 4

## MAINTENANCE

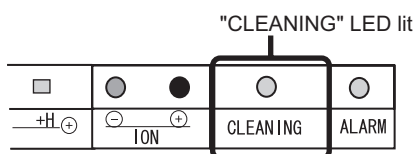
 Precautions during Maintenance	36
 Cleaning and Replacement	37
Cleaning the Discharge Needles	37
Cleaning the Discharge Needle Modules	38
Replacing Discharge Needles	40
Replacing Discharge Needle Modules	41

## Precautions during Maintenance

Periodically clean the discharge needles as dirt or wear on the needles cause a reduction in the amount of generated ions, impairing deionizing performance.



Lighting of the "CLEANING" LED on the operation indicator panel on the ZJ-BA serves as a guideline as to when maintenance is required.



## Cleaning and Replacement

### Cleaning the Discharge Needles

Use the exclusive cleaning jig for cleaning the discharge needles.



Always turn off the power supply before cleaning the discharge needles. The ZJ-BA may break down if the discharge needles are cleaned while the power is on.

#### 1. Turn the ZJ-BA off.

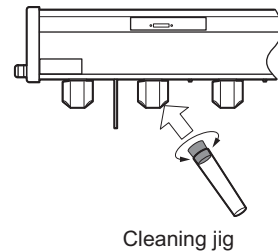


Turning the ZJ-BA off by the remote control p.30



Turning the ZJ-BA off by external signals p.17

#### 2. Insert the cleaning jig, and turn two or three turns to the left and right.



Cleaning jig

## Cleaning the Discharge Needle Modules

When a discharge needle module becomes dirty, remove it from the body and clean it with alcohol or other inorganic solvent.


Discharge needle modules come in one of two specifications, single-pole specification or dual-pole specification. Check the installation location before installing the discharge needle module.


 Part Names p.5



Always turn off the power supply before cleaning discharge needle modules. The ZJ-BA may break down if the discharge needle modules are cleaned while the power is on.

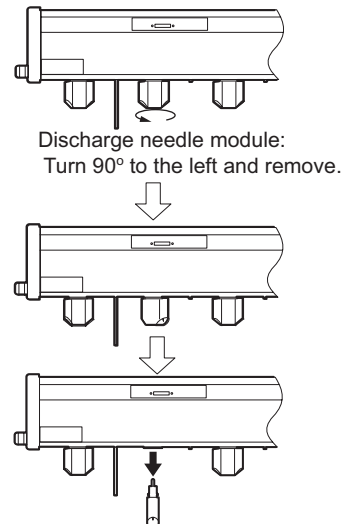
### 1. Turn the ZJ-BA off.

 Turning the ZJ-BA off by the remote control p.30

 Turning the ZJ-BA off by external signals p.17

### 2. Grip the discharge needle module, and turn 90° to the left.

The discharge needle module comes away from the body.



### 3. Wipe dirt from the discharge needle module with alcohol.



Prevent alcohol from entering the pin connector in which the discharge needle was inserted.

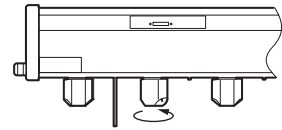
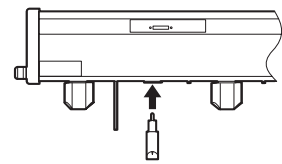
The ion balance will be affected if alcohol gets inside the pin connector.

## 4. Insert the discharge needle module into the body, and turn 90° to the right.

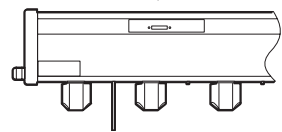


Discharge needle modules come in one of two specifications, single-pole specification or dual-pole specification.

- Be sure to install single-pole specification discharge needle modules on both ends of the body so that the discharge needle insertion slot faces the inside.
- Install dual-pole specification modules at locations other than both ends.



Discharge needle module:  
Turn 90° to the right and install.



## Replacing Discharge Needles

Replace discharge needles when they become worn.



Always turn off the power supply before replacing discharge needles. The ZJ-BA may break down if discharge needles are replaced while the power is on.

### 1. Turn the ZJ-BA off.



Turning the ZJ-BA off by the remote control p.30

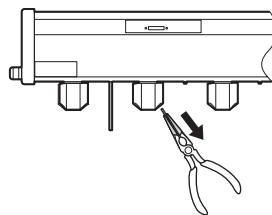


Turning the ZJ-BA off by external signals p.17

### 2. Wrap tape around the tips of the radio pliers, grip the needle between the two tips, and draw the needle out straight.



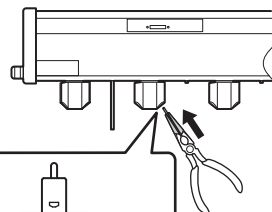
Take care to prevent the tip of the needle from becoming scratched.



### 3. Insert a new discharge needle straight using the radio pliers.



Firmly insert the discharge needle to prevent its tip from protruding from the surface of the hole on the discharge needle module.



Insert so that the tip of the discharge needle does not protrude from here.



## Replacing Discharge Needle Modules

Replace discharge needle modules when they are damaged.

Discharge needle modules come in one of two specifications, single-pole specification or dual-pole specification. Check the installation location before replacing the discharge needle module.



Always turn off the power supply before replacing discharge needle modules. The ZJ-BA may break down if discharge needle modules are replaced while the power is on.

### 1. Turn the ZJ-BA off.



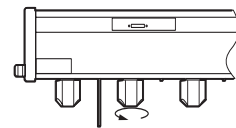
Turning the ZJ-BA off by the remote control p.30



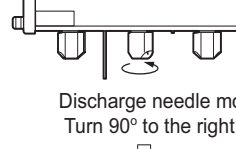
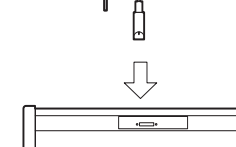
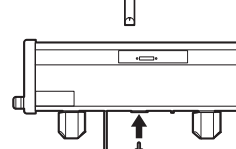
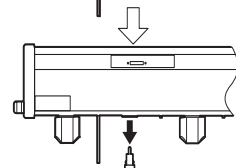
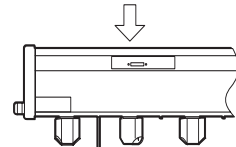
Turning the ZJ-BA off by external signals p.17

### 2. Grip the discharge needle module, and turn 90° to the left.

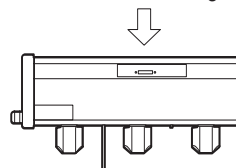
The discharge needle module comes away from the body.



Discharge needle module:  
Turn 90° to the left and remove.



Discharge needle module:  
Turn 90° to the right and install.



### 3. Insert the new discharge needle module into the body, and turn 90° to the right.









Discharge needle modules come in one of two specifications, single-pole specification or dual-pole specification.

- Be sure to install single-pole specification discharge needle modules on both ends of the body so that the discharge needle insertion slot faces the inside.
- Install dual-pole specification modules at locations other than both ends.

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# Section 5

## APPENDIX

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## Troubleshooting

This section describes countermeasures for temporary hardware problems. Check the malfunction in this section before sending the hardware for repair.

Problem	Probable cause	Possible countermeasure	Pages
Power does not turn on.	Are the AC power supply cable and modular connectors disconnected?	Correctly connect the AC power supply cable and modular connectors.	p.14
	Is the AC 100 V to AC 240 V, or DC 24 V power supply on?	Check the voltage of the mains power supply being used.	p.14
Cannot turn the power on/off by the remote control.	Are the group No. and ID No. of the ZJ-BA set correctly to the remote control?	Select the group No. and ID No. of the ZJ-BA on the remote control.	p.24 p.25
Incorrect remote control display. Or, the remote control cannot be operated correctly.	Is the battery voltage low?	Replace the remote control batteries.	p.7
	Are two or more of the same remote controls being used simultaneously nearby?	Use only one remote control at a time.	-
The deionizing speed rapidly slows down.	Is the pressure of the air entering the body 0.3 MPa or more?	Air pressure exceeding the specified value may cause a breakdown. Contact your OMRON sales representative.	-
The deionizing speed gradually slows down.	Is foreign matter sticking to the tips of the discharge needles?	Clean the tips of the discharge needles.	p.37
Deionizing is not performed.	Is either the "+/- ION OUTPUT" LED or the "ALARM"/"CLEANING" LED on the body lit?	Turn the power off then back on again. Or, reset ALARM using the remote control.	p.30
The "ALARM" LED lights.	-	Turn the power off then back on again. Or, reset ALARM using the remote control.	p.30
The "ALARM" LED lights. (The LED lights again even if the alarm state is reset.)	-	Contact your OMRON sales representative.	-
The "CLEANING" LED lights.	Is foreign matter sticking to the tips of the discharge needles?	Clean the discharge needles.	p.37
	-	Turn the power off then back on again.	p.30
The ion balance deviates by 100 V or more.	Is "ION BALANCE MODE" on the body "0" (Zero Balance mode)?	Set the ion balance to [ZERO] (Zero Balance mode) on the remote control. After setting the ion balance, set [BALANCE LOCK]. "The "BALANCE LOCK" LED lights.	p.26 p.28

## Glossary

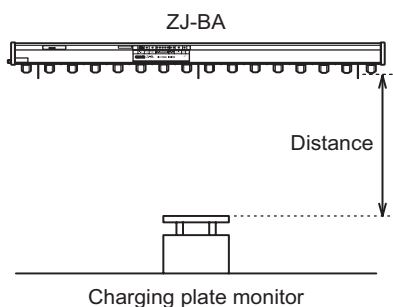
Term	Explanation
DC method	By this method, plus ions and minus ions are emitted continuously from separate discharge needles.
Zero Balance mode	In this mode, the balance between the amount of generated plus and minus ions is automatically controlled by the ion balance sensor.
Air purge	Air introduced from the air intake duct on the body is sprayed from 0.3 mm dia. holes on the body. This air carries the plus and minus ions at high speed to the object to be deionized.
Ion balance	This is the ratio between the amount of plus and minus ions generated by the ZJ-BA. A "poor ion balance" refers to a disproportionately generated amount of plus and minus ions.
Deionizing speed	This speed is an indicator of the deionizing performance of the ionizer. The slower the speed, the higher the deionizing performance.

## Deionizing Performance

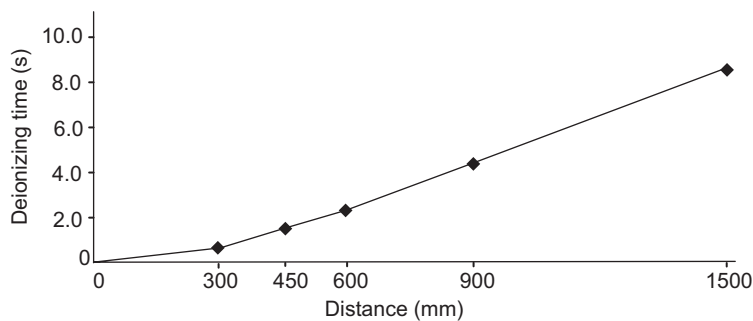
Measured values are typical values. The values change according to the measurement environment.

[Measurement Conditions]

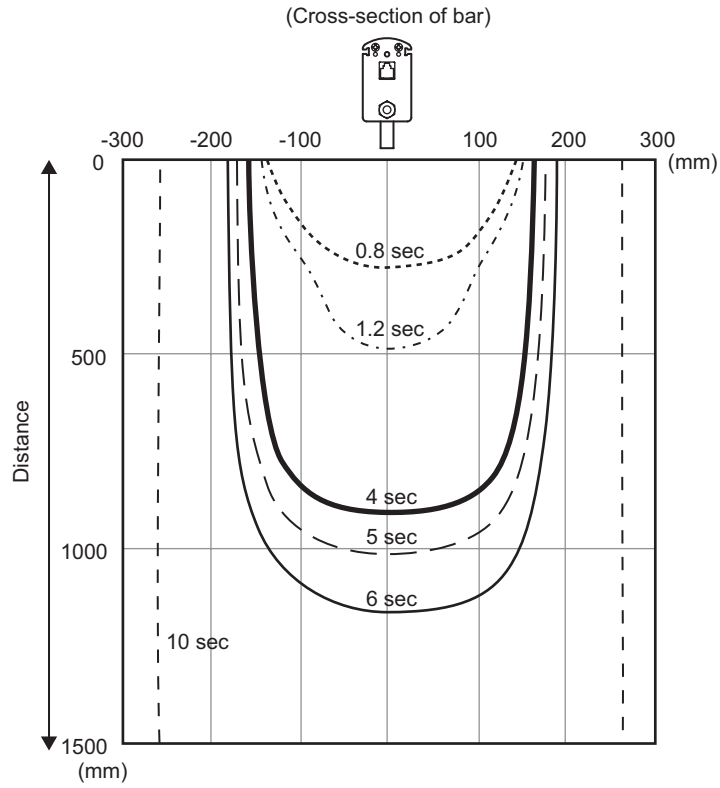
- Air flow rate: 1 L/min per hole
- Deionizing time: Attenuation time from +1000 V to +100 V
- Measurement device (charging plate monitor): Plate area (150 mm x 150 mm), 20 pF



### Installation Distance and Deionizing Time



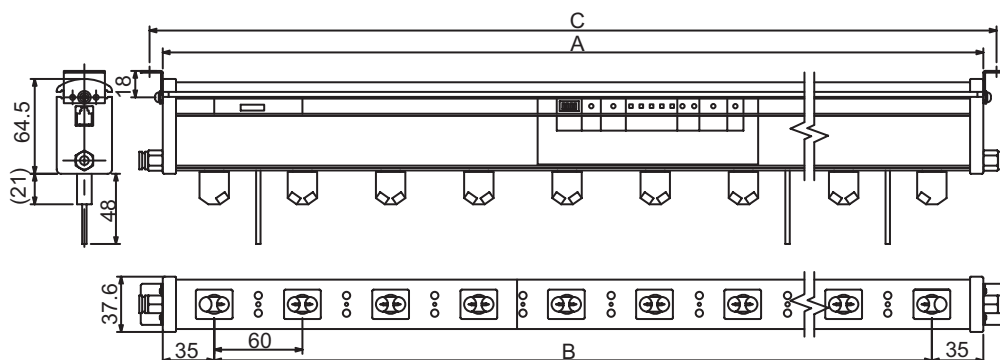
## Deionizing Area and Deionizing Time



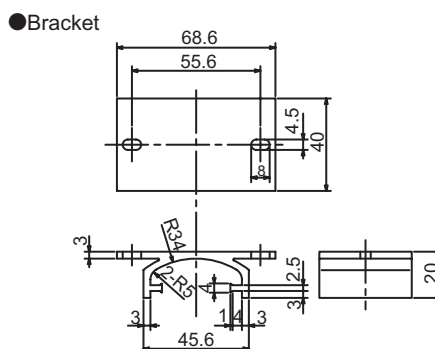
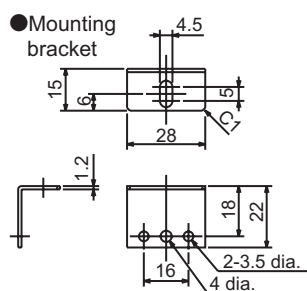
# Specifications and External Dimensions

## Ionizer Body

### ■ ZJ-BA body



Model	A (mm)	B (mm)	C (mm)	Number of needles
ZJ-BA049	490	420	508	14
ZJ-BA073	730	660	748	22
ZJ-BA097	970	900	988	30
ZJ-BA121	1210	1140	1228	38
ZJ-BA145	1450	1380	1468	46
ZJ-BA169	1690	1620	1708	54
ZJ-BA193	1930	1860	1948	62
ZJ-BA217	2170	2100	2188	70
ZJ-BA241	2410	2340	2428	78
ZJ-BA265	2650	2580	2668	86

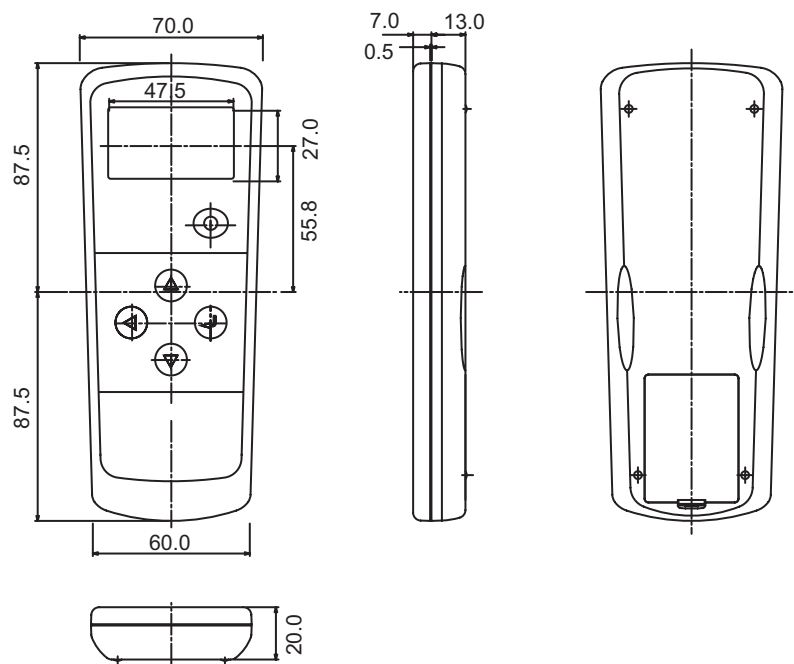




\*2: For details on polysilicone needles, contact us separately.

# Exclusive Remote Control

ZJ-BA-R01

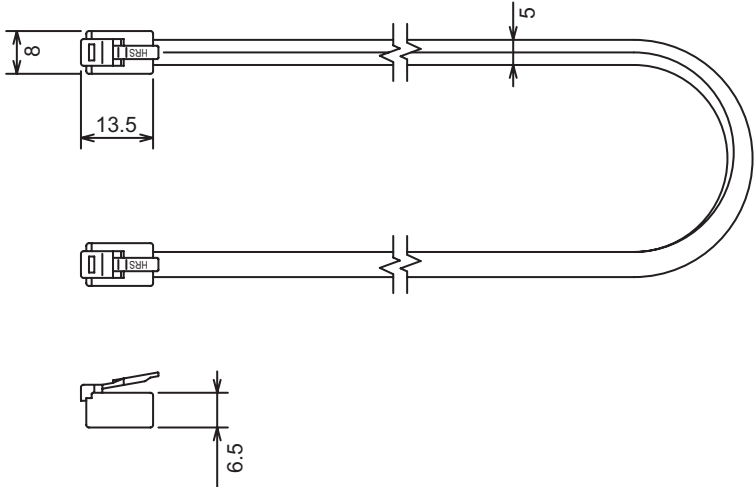


Item	ZJ-BA-R01
Communications system	Wireless communications
Number of identified bodies	16 units
Power supply	3 AAA batteries (*1)
Weight (excluding packing)	Approx. 150 g
Accessories	3 batteries

\* 1: Commercially available alkali or manganese dry cells

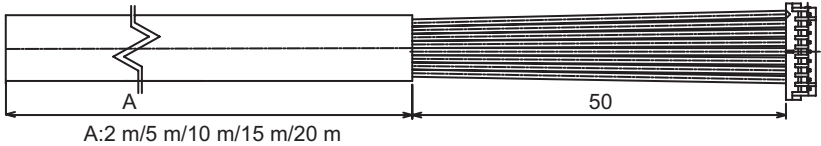
# Modular Cable

ZJ-BA-MC02/ZJ-BA-MC05/ZJ-BA-MC10/ZJ-BA-MC15/ZJ-BA-MC20



# I/O Cable

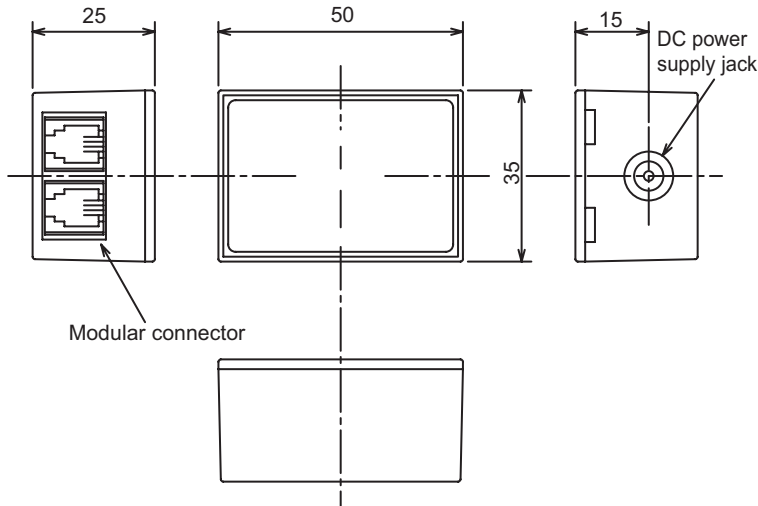
ZJ-BA-FC02/ZJ-BA-FC05/ZJ-BA-FC10/ZJ-BA-FC15/ZJ-BA-FC20



## Exclusive Power Supply (AC adapter type)

ZJ-BA-PS01

### ■ Adapter box

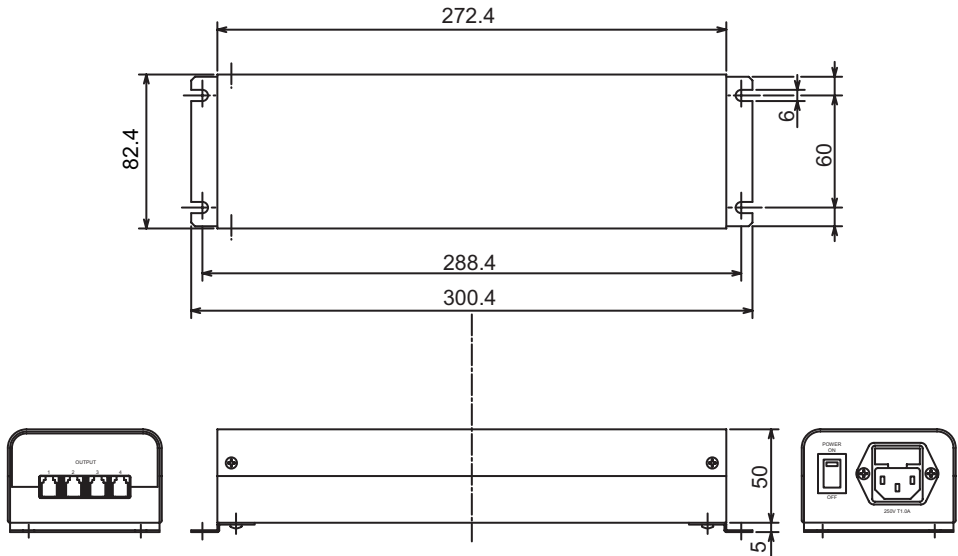


Item	ZJ-BA-PS01
Number of connected units	2 units
Input voltage	AC 100 V $\pm 10\%$
Input current	Max. 0.5 A (when 2 units are connected)
Output voltage	DC 12 V
Production configuration	Adapter box AC adapter AC power supply cable
Weight (excluding packing)	Adapter box :           Approx. 30 g AC adapter:            Approx. 130 g AC power supply cable: Approx. 250 g

## Exclusive Power Supply (high-output type)

ZJ-BA-PS02

### ■ AC power supply

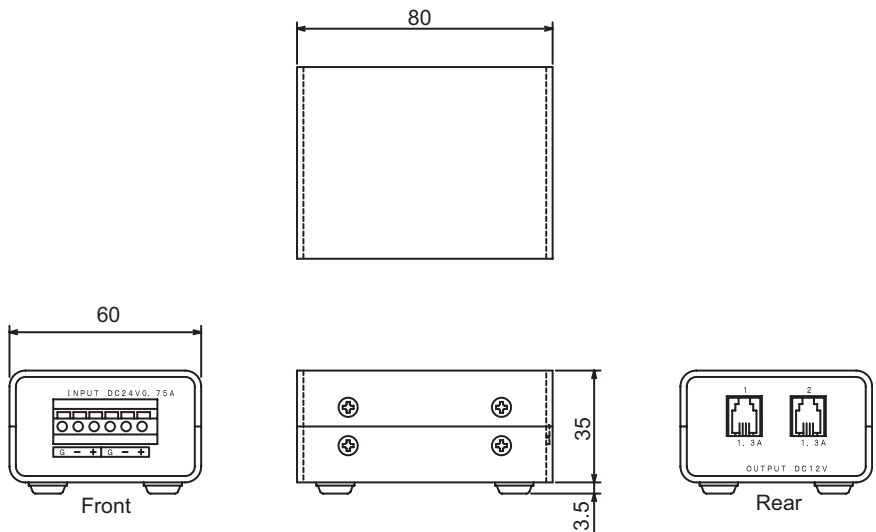


Item	ZJ-BA-PS02
Number of connected units	8 units
Input voltage	AC 100 V $\pm$ 10%
Input current	Max. 1.5 A (when 8 units are connected)
Output voltage	DC 12 V
Production configuration	AC power supply AC power supply cable
Weight (excluding packing)	AC adapter: Approx. 1300 g AC power supply cable: Approx. 250 g

## Exclusive Power Supply (DC input type)

ZJ-BA-PT01

### ■ Voltage conversion box



Item	ZJ-BA-PT01
Number of connected units	2 units
Input voltage	DC 24 V $\pm 10\%$
Input current	Max. 1.0 A (when 2 units are connected)
Output voltage	DC 12 V
Production configuration	Voltage conversion box
Weight (excluding packing)	Approx. 220 g

## List of Accessories

Type	Model	Remarks
Ionizer body	ZJ-BA049	Total length 490 mm/eff. length 420 mm
	ZJ-BA073	Total length 730 mm/eff. length 660 mm
	ZJ-BA097	Total length 970 mm/eff. length 900 mm
	ZJ-BA121	Total length 1,210 mm/eff. length 1,140 mm
	ZJ-BA145	Total length 1,450 mm/eff. length 1,380 mm
	ZJ-BA169	Total length 1,690 mm/eff. length 1,620 mm
	ZJ-BA193	Total length 1,930 mm/eff. length 1,860 mm
	ZJ-BA217	Total length 2,170 mm/eff. length 2,100 mm
	ZJ-BA241	Total length 2,410 mm/eff. length 2,340 mm
	ZJ-BA265	Total length 2,650 mm/eff. length 2,580 mm

### Options

Type	Model	Remarks
Exclusive remote control	ZJ-BA-R01	-
Modular cable	ZJ-BA-MC02	2 m
	ZJ-BA-MC05	5 m
	ZJ-BA-MC10	10 m
	ZJ-BA-MC15	15 m
	ZJ-BA-MC20	20 m
Exclusive power supply (AC adapter type)	ZJ-BA-PS01	•Adapter box •AC adapter •AC power supply cable
Exclusive power supply (high-output type)	ZJ-BA-PS02	•AC power supply •AC power supply cable
Exclusive power supply (DC input type)	ZJ-BA-PT01	Voltage conversion box
I/O cable	ZJ-BA-FC02	2 m
	ZJ-BA-FC05	5 m
	ZJ-BA-FC10	10 m
	ZJ-BA-FC15	15 m
	ZJ-BA-FC20	20 m
Replacement needles	ZJ9-NDT04	4 pack
	ZJ9-NDT06	6 pack
	ZJ9-NDT08	8 pack
Discharge needle module (single-pole specification)	ZJ9-BA-NT102	Pack of 2
Discharge needle module (both-pole specification)	ZJ9-BA-NT202	Pack of 2
Cleaning jig	ZJ9-BA-CT01	Pack of 20

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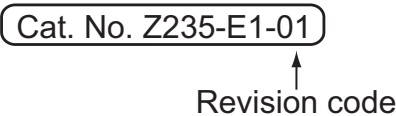
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# Revision History

A manual revision code appears as a suffix to the catalog number at the bottom of the front and back covers of this manual.



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