NEW

OMRON

Static Sensors and Ionizers
Series Catalog

"Visible" Static Electricity

Measuring Static Electricity In-line

Thorough Ionization

Best Ion Balance in its Class

realizing

Sensing and Controlling Static Electricity

With more compact parts and more intricate electronic devices at production sites, countermeasures against static electricity are vitally important to improve product quality and increase yield. The problem onsite is how to make invisible static electricity "visible" and how to define effective ionization. OMRON contributes to static electricity countermeasures and improving product quality by providing Electrostatic Sensors and High-performance Ionizers with the best ion balance characteristics in their class.

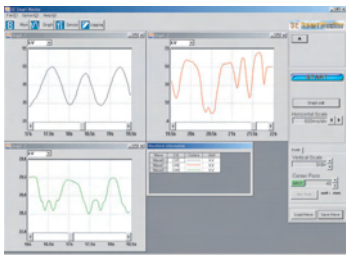
for High Quality Products

"Visible" Static Electricity Sensing

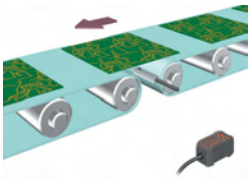
Direct Display of Static Charge

Electrostatic Sensor ZJ-SD100/ZJ-SDA11

Compact Sensor Head (6 × 6 × 65 mm) with visual display of workpiece static charge on a Smart Digital Amplifier.
Multi-point measurement and easy computer logging of static electricity.
Distance compensation, workpiece area compensation, and highly accurate static charge measurement using a Displacement Sensor.

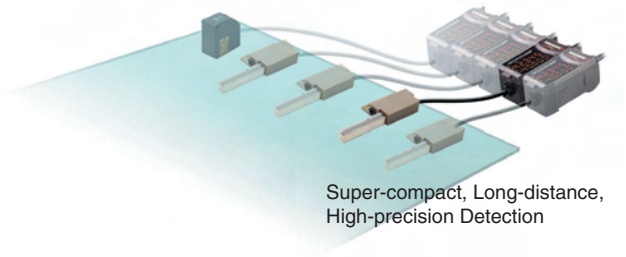


Static Electricity Countermeasures with Multi-point Measurement and Logging



Measurement of Charge on PCBs during Conveying

Measurement of Charge on Liquid Crystal Substrates



Super-compact, Long-distance, High-precision Detection

High-speed, High-performance Ionization Ionization

Fan Type

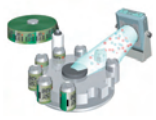
Dual-mixing Variable-DC Method

Fan Type Ionizer ZJ-FA

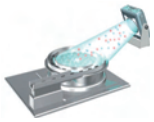
Discharge time: 3 s max., high-performance ion balance of ±10 V max.
Uses a DC Ionizer with high ion levels and achieves excellent ion balance with a unique fan construction and automatic balance control.

Advanced Type

General-purpose Type



Preventing adhesion of foreign particles when labeling



Ionizing resin parts

Ionizing cell manufacturing lines during assembly

Bar Type

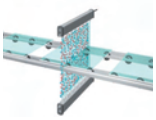
Dual-mixing Variable-DC Method

Air Purge Ionizer ZJ-BA

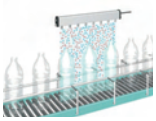
Discharge time: 3 s max., high-performance ion balance of ±30 V max.
The built-in Ion Balance Sensor automatically controls the positive and negative ion balance.
Enables high-speed ionization with positive and negative mode functions.

Positive mode for generating many positive ions

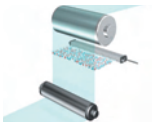
Negative mode for generating many negative ions



Ionizing while conveying liquid crystal substrates



Preventing rebounding of PET bottles



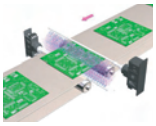
Preventing wrapping film from curling

Blow Type

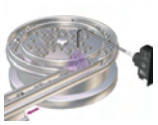
High-frequency AC Method

Air Push Ionizer KS1

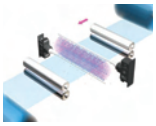
High-frequency (68 KHz) AC method with excellent ion balance.
Many nozzle variations for a variety of applications, e.g., spot/screen ionization.



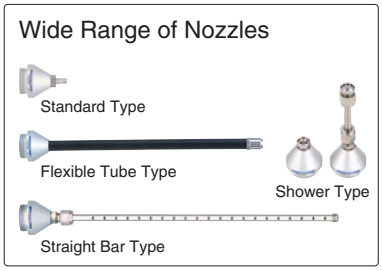
Ionization of both sides of PCBs



Spot ionization of parts



Ionization of films



ZJ-SD

from the FACTORY

Smart Electrostatic Sensor

ZJ-SD Series

Smart Static Electricity Sensing: Making Static Electricity Visible

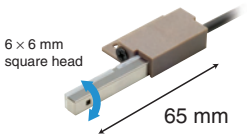
The unpredictable nature of static electricity creates the need for a sensor for constant in-line monitoring to properly capture static electricity.
Smart collection of effective data to improve production site countermeasures is now possible.

Smart In-line Measurement of Production Site Static Electricity

Compact Sensor Head and Smart Amplifier

Hand-held devices and large measuring devices are not suitable for easily measuring static charges of workpieces in-line.
The Sensor Head of the Smart Electrostatic Sensor is small (6 × 6 × 65 mm) and the bracket has a rotating mechanism, making it possible to mount it even where space is limited.

Compact Sensor Head



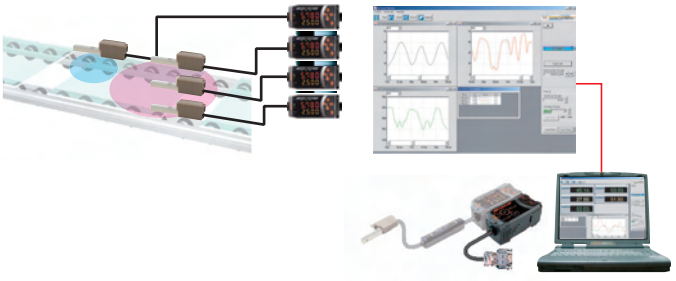
The bracket on the Head enables changing the sensing direction even after installation.

Smart Amplifier

Direct display of static charge

Smart Static Electricity Monitoring

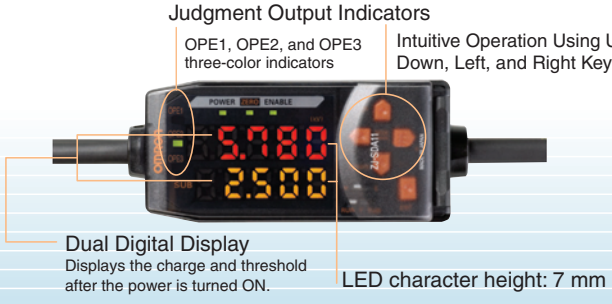
For effective discharge, measurements must be made at more than one location and changes over time need to be monitored. With the ZJ-SD, multi-point measurements from up to 5 Units can be made easily if a Calculating Unit is connected between Amplifiers. And the Electrostatic Sensor measurement data can be displayed and logged on a personal computer via an Interface Unit and used for static electricity countermeasures.



Our Highest Priority: Easy Onsite Operation

Simple Settings Using Key Operations

A seven-segment, two-row display is provided for workpiece charge and threshold displays.
Settings are easy to make using Up, Down, Left, and Right Keys.



Remote Detection

Use the ZX-XC□A (order separately) to extend the cable to 2, 5, or 9 m.

Best Long-distance, High-precision Measurements in the Industry

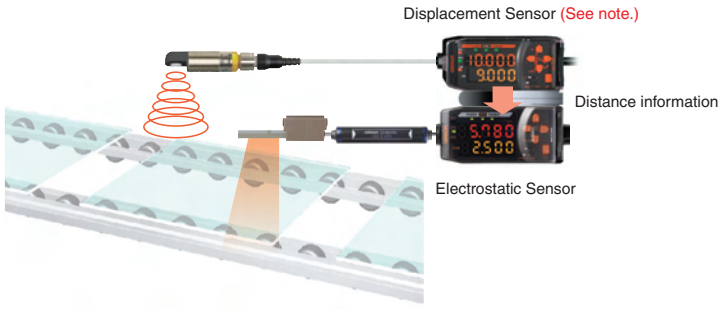
The ZJ-SD provides the highest detection accuracy in the industry when combined with a ZX Displacement Sensor. And even more precise measurements are possible with the compensation function that adjusts to the size of the workpiece.

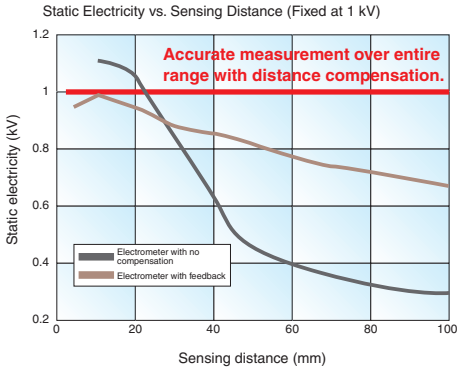
Workpiece Distance Compensation

Long-distance, High-precision Measurements

The best sensing range in the industry at 100 mm/ ±50 kV.
Sensors that measure static charges are greatly affected by the measurement distance. The ZJ-SD solves this problem by combining with a ZX-series Displacement Sensor to enable communicating distance information and thus achieve high-accuracy measurements.

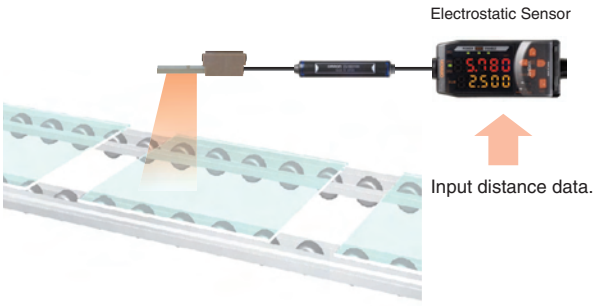
Note: Ultrasonic Displacement Sensors are also available. Contact your OMRON representative for details.





Unaffected by Measurement Distance

In addition to distance data compensation performed by the Displacement Sensor, errors from distance fluctuations can also be reduced by directly inputting the installation distance into the Amplifier.

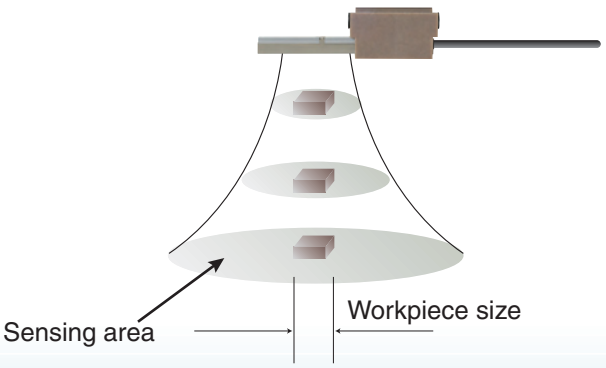


Workpiece Size Compensation

Accurate Static Charge Measurements for Small Workpieces

The Electrostatic Sensor's sensing area is approximately five times the installation distance.
Enter the workpiece size to measure the static charge of workpieces smaller than the sensing area. (See note.)
The ZJ-SD can compensate the static charge based on a comparison of the installation distance recorded in the Preamplifier and the size of the sensing area.

Note: Except for the workpiece, static charge inside the sensing area must be 0 V. Use a measurement error of approximately 10% as a guide for a measurement distance of 5 mm and a workpiece of 10 mm in diameter.



Long distance,
Highly accurate detection

Ordering Information

Electrostatic Sensor

Sensor Head

Appearance	Sensing distance	Model
	5 to 100 mm	ZJ-SD100

Amplifier

Appearance	Power supply	Output method	Model
	DC	NPN output	ZJ-SDA11

Accessories (Order Separately)

Calculating Unit

Appearance	Model
	ZX-CAL2

Preamplifier Mounting Brackets

Appearance	Model	Remarks
	ZX-XBT1	Included with Sensor Head.
	ZX-XBT2	For DIN Track mounting

SmartMonitor Sensor Setup Tool for Personal Computer Connection

Appearance	Name	Model
 +CD-ROM	Communications Interface Unit and software for setup and display	ZJ-SFW11

Cables with Connectors on Both Ends (for Extension)

Cable length	Model	Quantity
1 m	ZX-XC1A	1
4 m	ZX-XC4A	
8 m	ZX-XC8A	

Sensor Head Mounting Bracket for Distance Compensation

Appearance	Model	Remarks
	ZJ-XBU1	Used for distance compensation using a Displacement Sensor.

Specifications

Sensor Head

Item / Model	ZJ-SD100
Applicable Amplifier	ZJ-SDA11
Sensing distance	5 to 100 mm
Measurement voltage	Standard mode: ±50 KV, Precision mode: ±5 KV max. (See note 1.)
Display resolution	Standard mode: 10 V, Precision mode: 1 V (See note 2.)
Linearity (See note 3.)	±5% FS (See note 4.)
Response time	20 ms
Ambient temperature range	Operating and storage: 0 to 50°C (with no condensation or icing)
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)
Dielectric strength	1,000 VAC, 50/60 Hz, 1 min (See note 5.)
Vibration resistance	Sensor Head: 3-mm double amplitude at 10 to 55 Hz for 45 min each in the X, Y, and Z directions, Preamplifier: 1.5-mm double amplitude at 10 to 55 Hz for 2 h each in the X, Y, and Z directions
Degree of protection	IP20
Connection method	Pre-wired Connector (standard length: 2 m)
Weight (packed state)	Approx. 150 g
Materials	Sensor Head: Stainless steel Preamplifier: PC
Accessories	Instruction sheet, Preamplifier Mounting Brackets (ZX-XBT1)

Note 1. The measurement may become saturated if the Sensor is too close to an object being measured, even if it is within the measurement voltage range. Use the distance from the measurement surface (mm) times 1 KV as a guide.
2. This is the minimum value obtainable when a ZJ-SDA11 Amplifier Unit is connected.
3. When the ambient temperature is stable at 25°C.
4. When the measurement distance is 10 mm and the measurement voltage is –5 to 5 KV.
5. When a Preamplifier is used (excluding the Sensor Head).

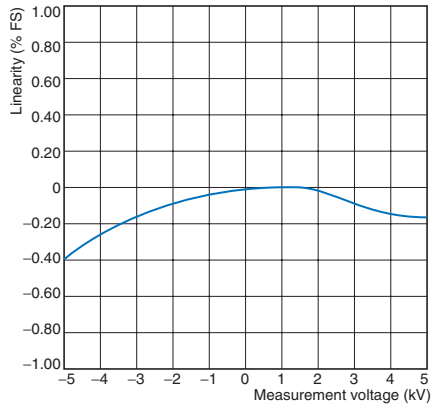
Ionizer

Item / Model	ZJ-SDA11
Measurement period	1 ms
Possible average count settings (See note 1.)	1, 2, 4, 8, 16, 32, 64, 128, 256, 512, or 1,024
Linear output (See note 2.)	Current output: 4 to 20 mA/FS, Max. load resistance: 300 Ω Voltage output: ±4 V (±5 V, 1 to 5 V (See note 3.)), Output impedance: 100 Ω
Judgment outputs (3 outputs: OPE1, OPE2, and OPE3)	NPN open-collector output, 30 VDC, 20 mA max. Residual voltage: 1.2 V max.
Bank shift input, zero reset input, timing input, reset input	ON: Short-circuited with 0-V terminal or 1.5 V or less OFF: Open (leakage current: 0.1 mA max.)
Functions	Measurement value display, display reverse, scaling, peak and bottom hold, distance compensation, present value display, limit number of display digits, monitor focus, mask hold, sensing area compensation, output value display, zero reset, linear output compensation, distance trigger, warning output, setting value display, zero reset memory, peak hold, delay hold, bank switching, resolution display, various timers, bottom hold, delay time setting, enable display, initialization, sample hold, timing inputs, zero reset display, teaching, peak-to-peak, key lock, judgment output display, direct threshold value setting, hold, clamp value setting, ECO mode, hysteresis adjustment, average hold, precise measurement mode
Indications	Operation indicators (OPE1 (orange), OPE2 (green), OPE3 (yellow), 7-segment main digital display (red), 7-segment sub-digital display (yellow), power ON indicator (green), zero reset indicator (green), enable indicator (green)
Power supply voltage	24 VDC ±10%, Ripple (p-p): 10% max.
Current consumption	24-VDC power supply: 140 mA max.
Ambient temperature range	Operating and storage: 0 to 50°C (with no icing or condensation)
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)
Insulation resistance	20 MΩ (at 500 VDC)
Dielectric strength	1,000 VAC, 50/60 Hz, 1 min
Shock resistance	Destruction: 300 m/s^2 3 times each in 6 directions (up/down, left/right, and forward/backward)
Vibration resistance	Destruction: 0.7-mm double amplitude at 10 to 150 Hz for 80 min each in the X, Y, and Z directions
Connection method	Pre-wired (standard length: 2 m)
Weight (packed state)	Approx. 350 g
Materials	Case: PBT (polybutylene terephthalate), Cover: Polycarbonate
Accessories	Instruction sheet

Note 1. The response time of the linear outputs is calculated as follows: Measurement period × (Average count setting + 1).
The response time of the judgment outputs is calculated as follows: Measurement period × (Average count setting + 1).
2. The output can be switched between a current output and voltage output using a switch on the bottom of the Amplifier.
3. Setting is possible using the monitor focus function.

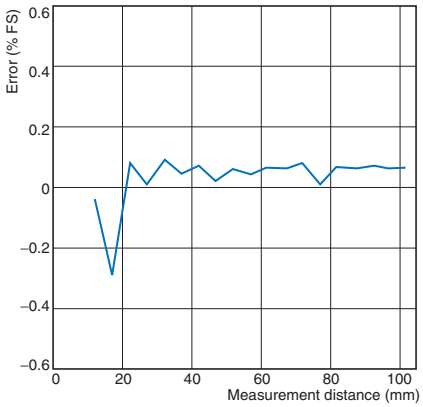
Engineering Data (Typical)

Measurement Voltage vs. Linearity



Measurement object: Charged plate (150 × 150 mm, 20 pF)
Measurement distance: 10 mm
Measurement mode: Standard

Measurement Distance vs. Error



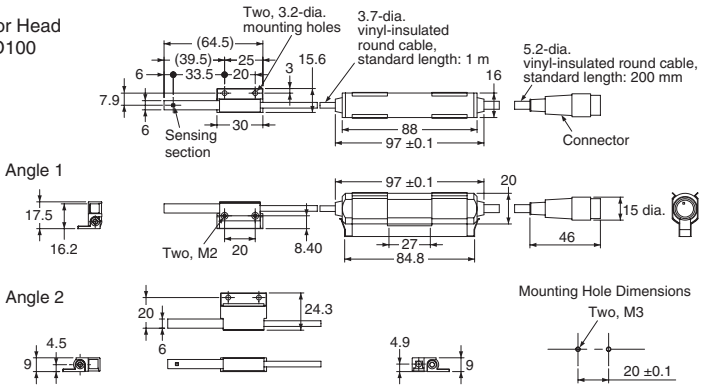
Measurement object: Charged plate (150 × 150 mm, 20 pF)
Measurement voltage: 5 kV
Measurement mode: Standard
Measurement after teaching the measurement distance to the Amplifier.

Dimensions

(Unit: mm)

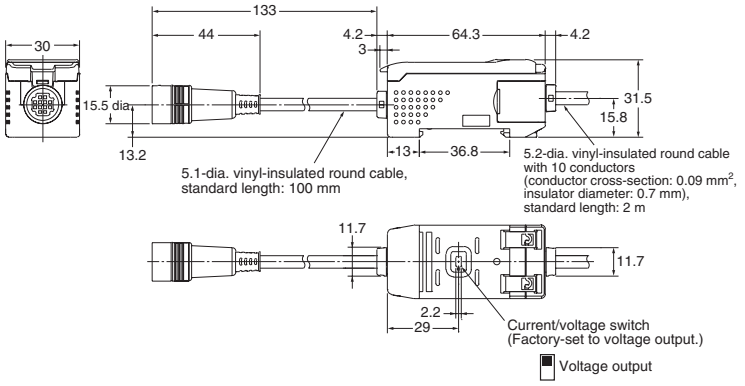
Electrostatic Sensor

Sensor Head
ZJ-SD100



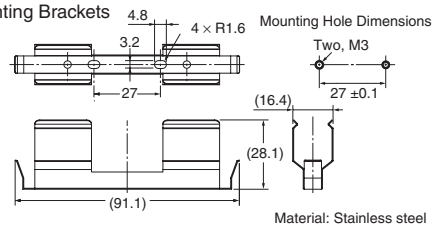
Amplifier

ZJ-SDA11

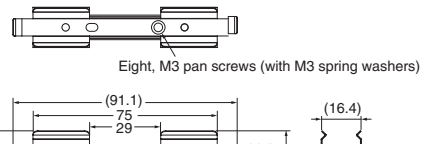


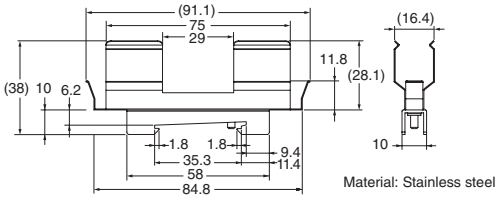
Accessories (Order Separately)

Preamplifier Mounting Brackets
ZX-XBT1

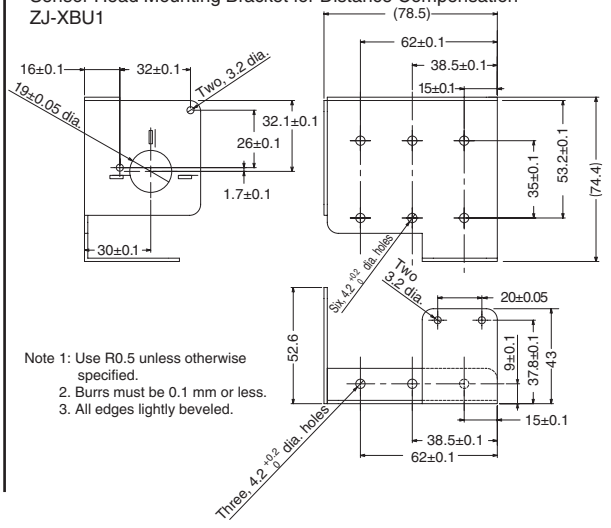


ZX-XBT2





Sensor Head Mounting Bracket for Distance Compensation
ZJ-XBU1



Note 1: Use R0.5 unless otherwise specified.
2. Burrs must be 0.1 mm or less.
3. All edges lightly beveled.

ZJ-FA10

from the FACTORY

Advanced Ionizer with Visible Discharge Status

Is your ionization complete?
Is your Ionizer working normally?
The ZJ-FA10 reduces on-site anxiety with its easy-to-read display and sensing functions.

Ionizer

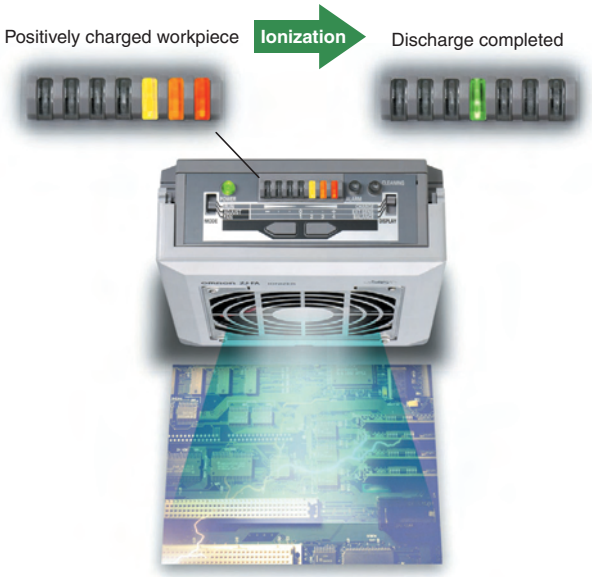
Advanced Fan Type

ZJ-FA10

Sensing

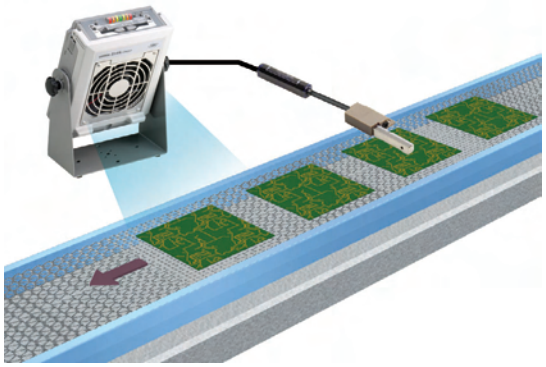
Sensing Charge and Discharge Status

Sensing workpiece charge and discharge status using the sensor on the face of the ZJ-FA10.
Easy-to-read indicator display on top of the ZJ-FA10.



Connect an Electrostatic Sensor Head

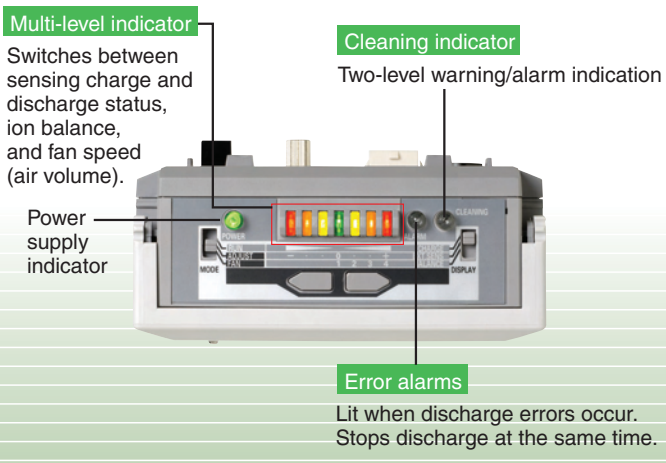
More accurate checking of remote workpiece charge and discharge status is possible by connecting the ZJ-SD100 Electrostatic Sensor Head.



Visualization

Easy-to-read Indicators

All indicators are located on top of the ZJ-FA10 for greater visibility. Charge/discharge status, ion balance/cleaning alarms, and other operation status can be checked easily. Alarm signals can also be sent as external outputs.

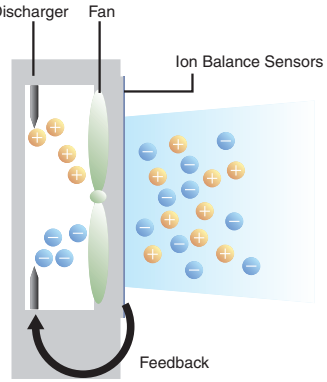


Performance

Efficient Ionization and Slimmer Unit with Dual-mixing Variable-DC Method

Thorough mixing and blowing of generated ions by the fan together with sensing and control of the ion balance. This method enables more sophisticated use of both ionization speed and ion balance performance. Innovations in the internal structure have made the Sensor dramatically slimmer.

Slim



Setting

Wide Range of Installation Options Perfect for Cell Manufacturing

Use the ZJ9-FA-BR01 Pipe-mounting Bracket to rotate the Sensor up, down, left, or right after installation by turning a knob. The Sensor can also be mounted to pipes in the cell manufacturing line.

Sensor can be adjusted to any direction after installation.

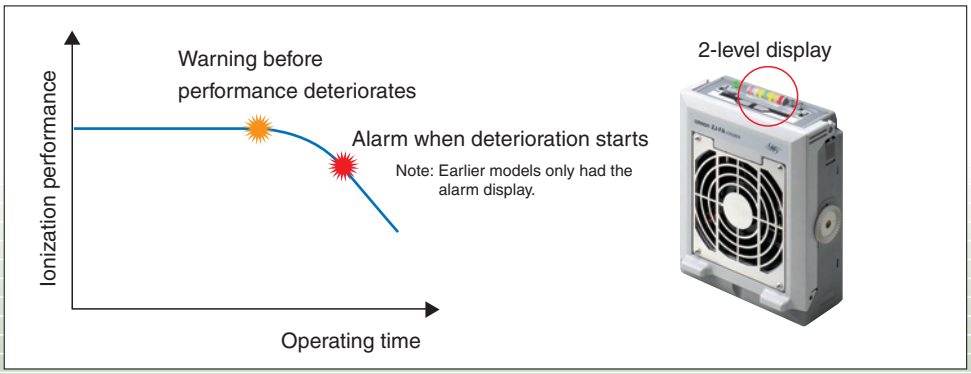
Pipe mounting makes the Sensor suitable for a variety of installation environments.

Maintenance

Completely Open Construction Means Simple Maintenance

The front panel opens up in three stages to a maximum of 180°. The discharger, internal parts, and the fan can be simply and effectively cleaned.

The ion output status is constantly monitored and a cleaning warning (output) given before the ionization characteristics deteriorate. The ZJ-FA10 facilitates on-site maintenance to maintain optimal ionization performance.



Ordering Information

Ionizer

Model
ZJ-FA10

Accessories

	Model
Pipe-mounting Bracket (for 28-dia. pipes)	ZJ9-FA-BR01
Replacement Filters	ZJ9-FL92 (pack of 10)
Replacement Dischargers	ZJ9-NDT08F (pack of 8)

Specifications

Ionizer

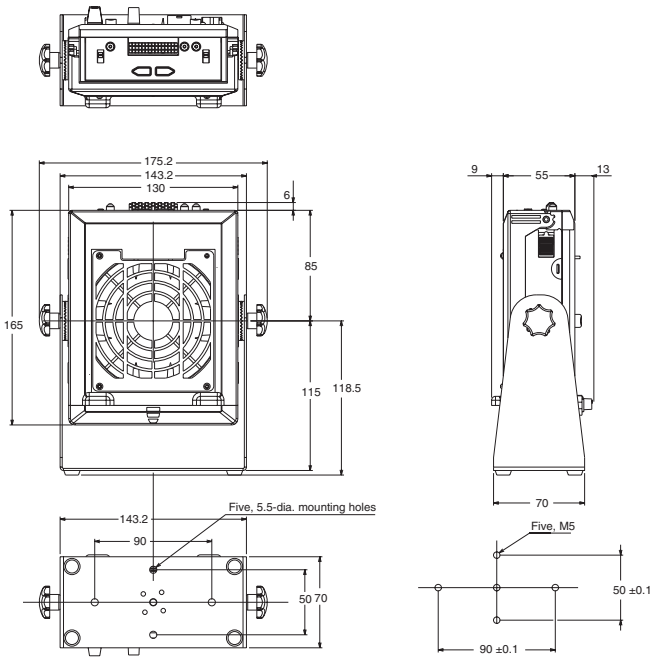
Item / Model	ZJ-FA10
Power supply voltage	24 VDC ±10% ripple (p-p) 10% max.
Current consumption	600 mA max.
Discharge voltage	±7 kV max.
Discharge method	Dual-mixing variable-DC method
Airflow	1.8 m^3/min max.
Discharge time (See note.)	Within 3.0 seconds
Ion balance (See note.)	±10 V max.
Amount of generated ozone	0.01 ppm max. (measured at a distance of 10 mm from air outlet)
Main functions	Fan speed adjustment, manual balance adjustment, charge/discharge status display, cleaning display/output, error display/output, key lock, connection to an external Electrostatic Sensor
External outputs	Warning output/cleaning output: Output from photo-MOS relay (300 mA at 30 VDC)
External Sensor	ZJ-SD-100 Electrostatic Sensor Head
Ambient temperature range	Operating and storage: 0 to 50°C (with no condensation or icing)
Ambient humidity range	Operating and storage: 35% to 65% (with no condensation or icing)
Weight (packed state)	2.7 Kg
Materials	Unit: ABS, Discharger: Tungsten
Accessories	Instruction sheet, AC adapter, I/O cable, English warning labels (3 types)

Note: Measurement location: center of air outlet at a distance of 300 mm
Discharge time: From ±1,000 V to ±100 V
Ion balance measurement time: 10 seconds
Plate monitor: 150 x 150 mm, 20 pF

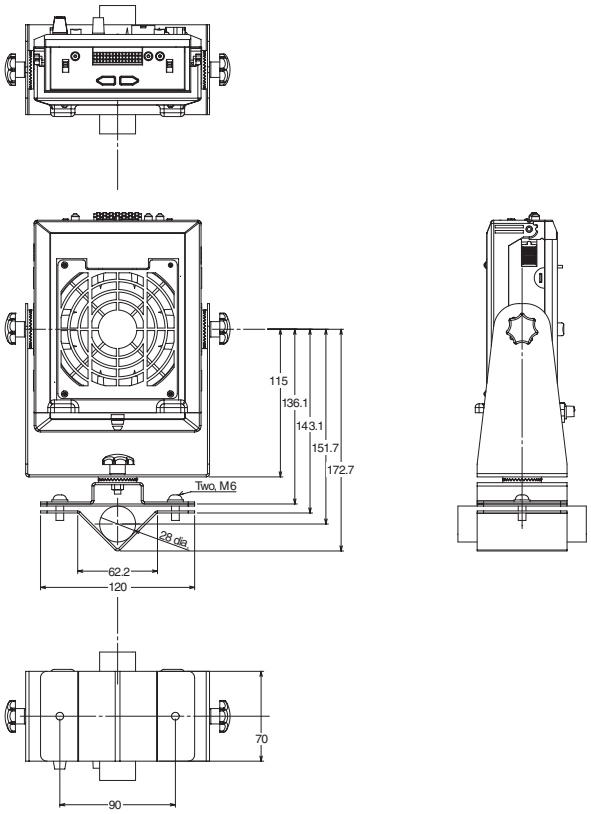
Dimensions

(Unit: mm)

ZJ-FA10 Ionizer

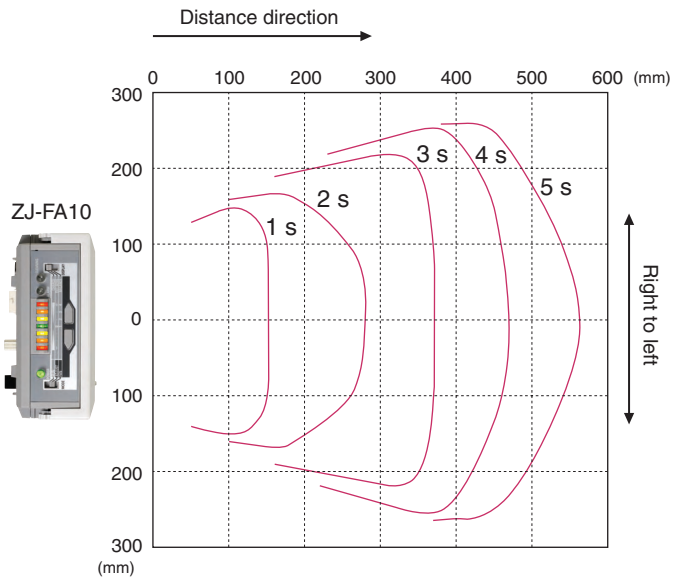


Using ZJ9-FA-BR01
Pipe-mounting Bracket

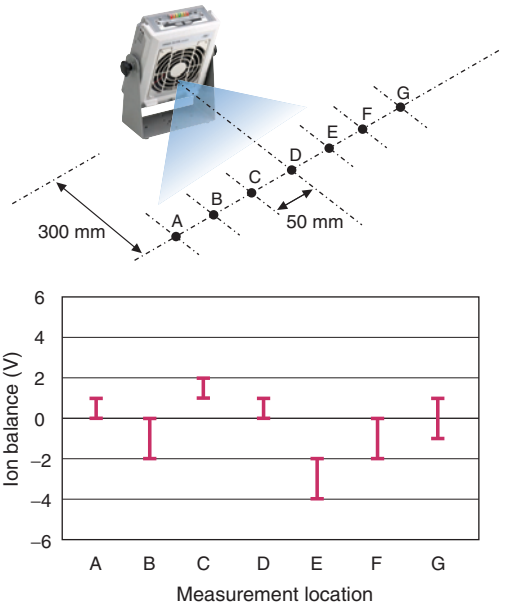


Engineering Data (Typical)

Discharge Area vs. Discharge Time



Ion Balance (Position Fluctuation Characteristics)



[Measurement conditions]
Airflow: Maximum
Discharge time: From +1,000 V to +100 V
Plate monitor: 150 x 150 mm, 20 pF

ZJ-FA01/02/03

from the FACTORY

Ionizer

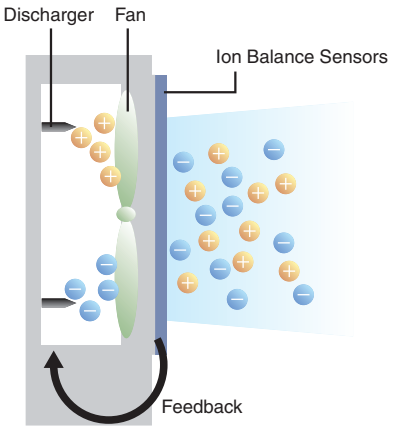
General-purpose Fan Type

ZJ-FA01/02/03

Improved Productivity with High-speed, High-performance Ionization

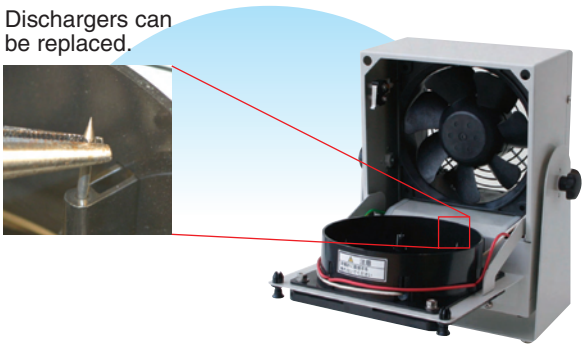
Dual-mixing Variable-DC Method

DC Ionizer achieves highest ion balance level in its class through a unique discharger and fan placement.



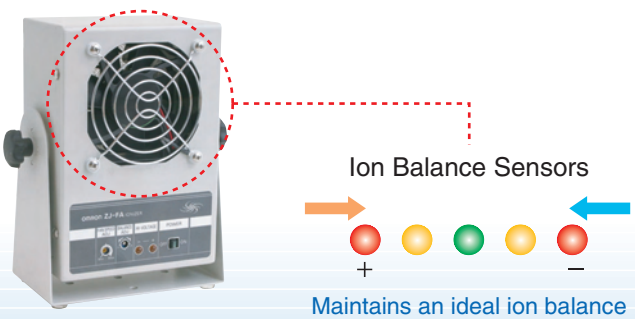
Cleaning Is Easy

The rear panel opens, making cleaning of the discharger and fan easy.
Dischargers can be replaced using pin connectors.



Constantly Maintain an Ideal Ion Balance

The front panel section functions as a sensor for monitoring the ion balance. Feedback from the sensor is used to constantly control the ion balance and maintain a zero balance.



Monitoring Provides a Constantly Clean Environment

The optional ZJ-MA01 Ion Monitor can be connected.
The ion balance is indicated in five levels, and notification when cleaning is required is also provided.
The cleaning signal can be sent as an external output.

Nomenclature

ZJ-FA01

Front

Unit fixing screws and angle adjustment washer

Can be adjusted/secured in increments of approx. 10 degrees.

Ion balance sensor (guard)

Detects the levels of positive and negative ions that are generated and controls the level of each.

Airflow adjuster

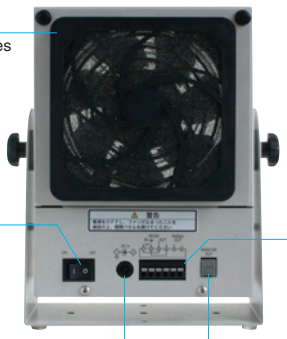
Ion balance adjuster

Adjusts the positive and negative ion balance. (The balance is set at the factory, but may require adjustment when measuring in the actual operating environment.)

Power supply indicator (green)

High-voltage output indicator (yellow)

Lights when high voltage is output.



Rear

Opening panel

Remove the two nylon latches to open and close the panel.

Power supply switch

Terminal block

Power supply input connector

Connects to the enclosed AC adapter.

Ion Monitor connector

Connects to the ZJ-MA01 Ion Monitor.

ZJ-MA01

Initial Status

Cleaning indicator (red)

Lights when cleaning is required (when ion balance control capability is exceeded).

Power supply switch

Ion balance Indicators

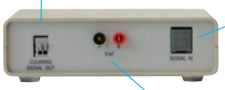
Indicates fluctuations in ion balance (e.g., changes in environment, dirty discharger, or proximity of charged object) in five levels.

Cleaning required

Changed ion balance

External output terminal

Outputs when the cleaning indicator is lit.



Connector (SIGNAL IN)

Connects to the Ionizer.

Standard voltage adjuster

Connect the tester to the standard voltage adjustment terminals on the rear panel, and adjust the measurement value to 1.00 V. This is the standard voltage used to display the ion balance with the five indicator levels.

Standard voltage adjustment terminals

Terminals to connect the tester used to set the standard voltage.

Ordering Information

Ionizers

Product	Airflow	Model
Ionizer Units	High	ZJ-FA01
	Medium	ZJ-FA02
	Low	ZJ-FA03
Ion Monitor	---	ZJ-MA01

Accessories

Product	Applicable model	Model
Replacement Filters (See note.)	ZJ-FA01	ZJ9-FL120 (pack of 10)
	ZF-FA02	ZJ9-FL80 (pack of 10)
Replacement Dischargers	ZJ-FA01	ZJ9-NDT06F (pack of 6)
	ZJ-FA02/03	ZJ9-NDT04F (pack of 4)

Note: The F120UL Guard/F80UL Guard manufactured by Japan Servo Co., Ltd. are used for the Replacement Filters.

Specifications

Ionizers

Item / Model	ZJ-FA01	ZJ-FA02	ZJ-FA03
Discharge time (See note 1.)	1.5 s max. (at center of air outlet and distance of 300 mm)	3.0 s max. (at center of air outlet and distance of 300 mm)	3.0 s max. (at center of air outlet and distance of 150 mm)
Power supply voltage	24 VDC ±10% ripple (peak-to-peak) 10% or less		
Current consumption (See note 2.)	900 mA max.	600 mA max.	600 mA max.
Discharge voltage	± 5.0 kV max.		
Airflow	1.3 to 2.2 m^3/min	0.47 to 0.8 m^3/min	0.255 m^3/min
Amount of generated ozone	0.01 ppm max. (measured at 10 mm from air outlet)		
Ambient temperature range	Operating: 5 to 40°C, storage: 0 to 40°C (with no icing or condensation)		
Ambient humidity range	Operating: 35% to 65%, storage: 35% to 85% (with no condensation)		
Indicators	Power indicator: green High-voltage output operation indicator: yellow (for both positive and negative sides)		
External outputs	Operation output: Signal output from photo-MOS relay (500 mA at 30 VDC)		
Functions	Automatic ion balance adjustment		
	Air filter provided		---
	Fan speed adjustment function		---
Weight (packed state)	Approx. 3.4 kg	Approx. 2.4 kg	Approx. 1.9 kg
Materials	Unit: SPCC melamine coating Air channel: ABS, Discharger: Tungsten		
Accessories	Instruction sheet, AC adapter		

Note 1. The plate (150 mm sq., 20 pF) of the charging plate monitor is charged to ±1000 V and the time it takes for the charge to decrease to ±100 V is measured. (The measurement method complies with EOS/ESD-S3.1-1991.)
2. Used to connect ZJ-MA01 Ion Monitor.

AC Adapter (Provided: SA130A-2413V-S by SINO-AMERICAN JAPAN CO., LTD.)

Item	
Input voltage	90 to 240 VAC, 50/60 Hz
Input current	0.5 A max.
Output voltage	24 VDC
Output current	1.3 A max.
Operating ambient temperature	0 to 40°C
Operating ambient humidity	20% to 80% (with no condensation)
Weight	250 g (excluding power cable)
Dimensions	52 × 35.2 × 119 mm (W × D × H)

Ion Monitor

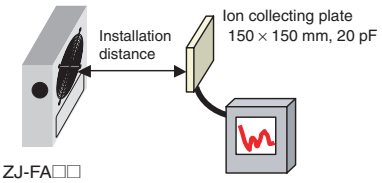
Item / Model	ZJ-MA01
Power supply voltage	Supplied from Ionizer (24 VDC ±10%, ripple (p-p) 10% max.)
Current consumption	100 mA max.
Ambient temperature	Operating: 5 to 40°C, storage: 0 to 40°C (with no icing or condensation)
Ambient humidity	Operating: 35% to 65%, storage: 35% to 85% (with no condensation)
Weight (packed state)	Approx. 500 g
Indications	Power indicator: green Cleaning indicator: yellow (for both positive and negative sides) Ion balance indicator: Red, yellow, green, yellow, red (positive side ← center → negative side)
External outputs	Cleaning output: Signal output from photo-MOS relay (500 mA at 30 VDC)
Materials	Unit top and bottom cover: A6063S-505 select ivory coating Unit front and rear panels: SPCC melamine coating
Accessories	Instruction sheet, relay cable: 3 m (two ferrite cores provided)

Discharge Characteristics (Typical)

Meaning of Measured Values

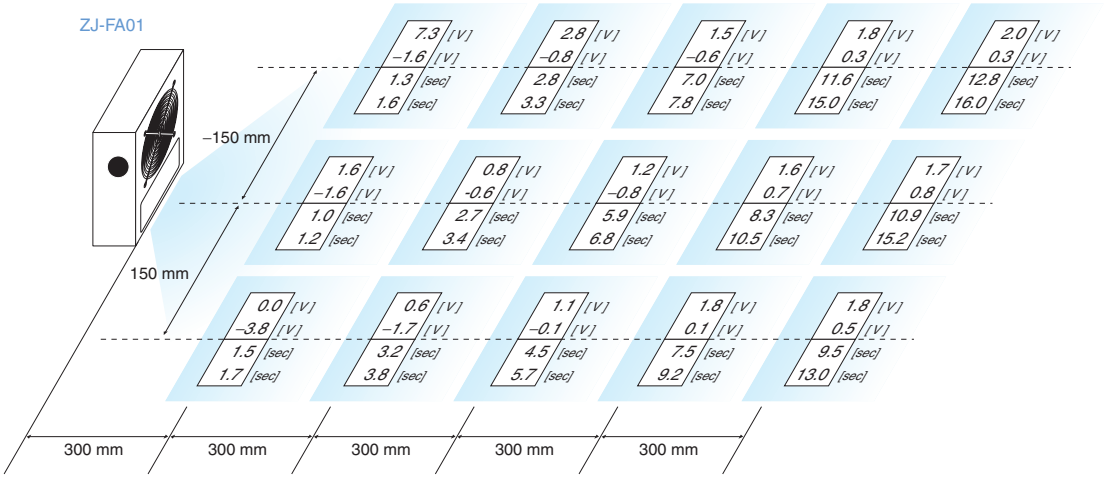
1.6	[V]	Maximum value of ion balance (10-s measurement)
−1.6	[V]	Minimum value of ion balance (10-s measurement)
1.0	[sec]	Discharge time (from +1000 V to +100 V)
1.2	[sec]	Discharge time (from −1000 V to −100 V)

Measurement Conditions

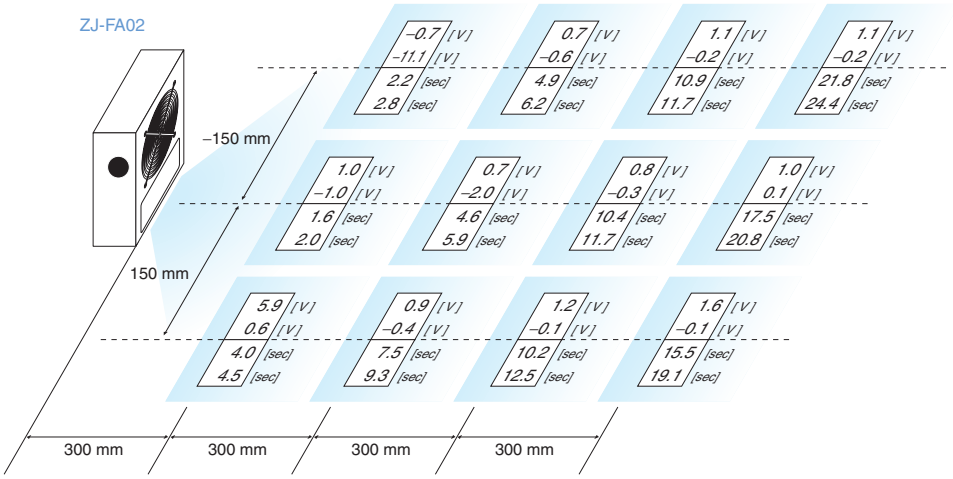


Airflow: Maximum
Temperature: 25°C
Humidity: 50%

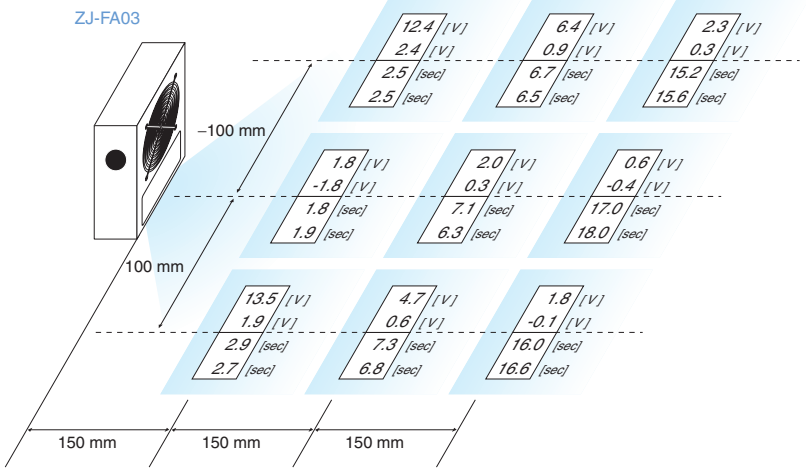
ZJ-FA01



ZJ-FA02



ZJ-FA03

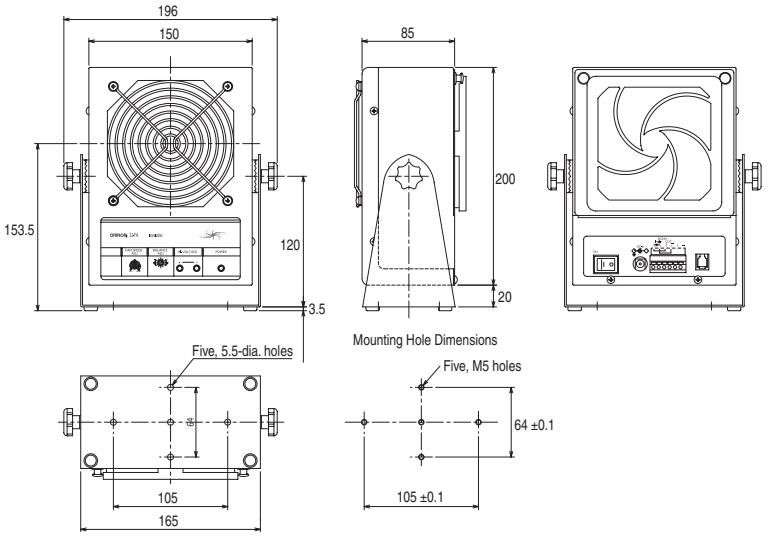


Dimensions

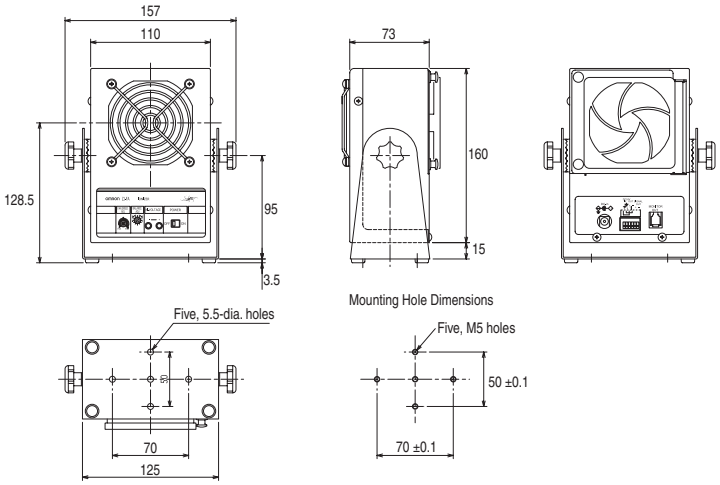
(Unit: mm)

Ionizer Units

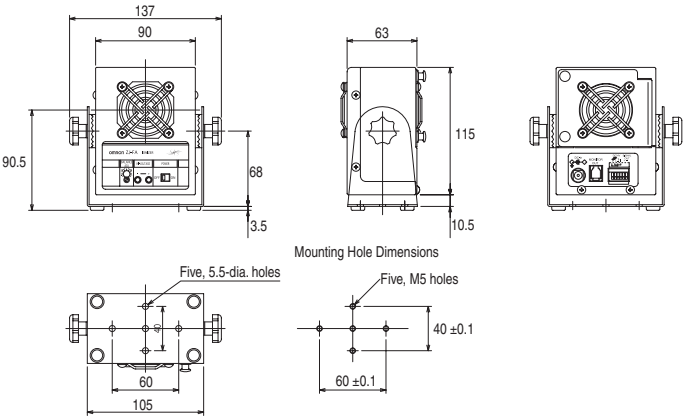
ZJ-FA01



ZJ-FA02

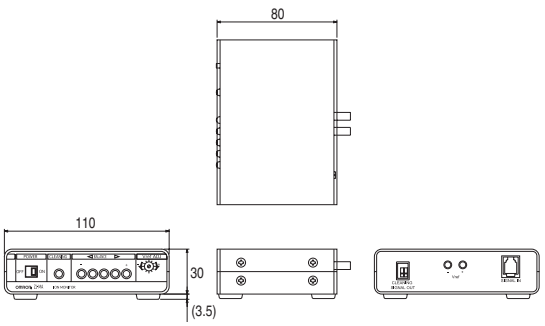


ZJ-FA03



Ion Monitor

ZJ-MA01



ZJ-BA

from the FACTORY

Ionizer
Bar Type
ZJ-BA

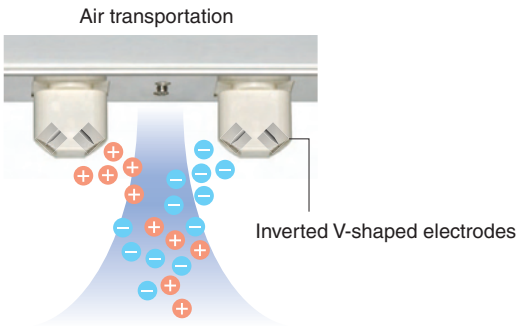
High-performance, High-speed Ionization over a Wide Area

Three sensors enable automatically controlling the ion balance in realtime and maintain a constantly stable ion balance over a wide area.

Pursuing the Ultimate in Ion Balance and Discharge Time

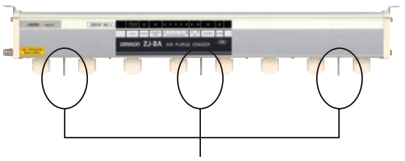
Dual-mixing Variable-DC Method

DC ionization is used for high ion generation over a wide area. To achieve advanced ion balance, the ZJ-BA Ionizer dischargers are positioned in an inverted V shape to mix positive and negative ions before transporting them by air.



Automatic Ion Balance

Ion balance sensors are located in the middle and at both ends. The built-in automatic ion balance function automatically controls the positive and negative ion balance. A flat ion balance is achieved over the entire length of the Ionizer by the three sensors.



Our Highest Priority: Easy Onsite Operation

Dischargers Replaced in One Easy Step Easy Maintenance and Economical

A Discharger can be easily replaced when it is dirty or otherwise requires replacement.
Individual Dischargers can be replaced using pin connectors.
Both easy maintenance and economy have been considered.

Only One Cable Even for Multiple Units Reduce Installation Time

The high-voltage power supply is built into the Unit, so only the Module Cable needs to be connected even when multiple Units are installed.

High Speed, High Performance

High Performance and Easy to Use

The ZJ-BA has an Ion Balance Mode for efficient, high-speed ionization and a remote control to make settings easily. No more time-consuming settings or handling. Optimal ionization has been achieved.

Three Ionization Modes to Match Any Workpiece

In addition to zero balance mode, the ion balance mode can be set to positive mode, which emits more positive ions or negative mode, which emits more negative ions.
If it is known that the workpiece often has a positive or negative electrostatic charge, faster discharge is possible by emitting many ions of the opposite polarity.

Zero balance mode

Positive mode

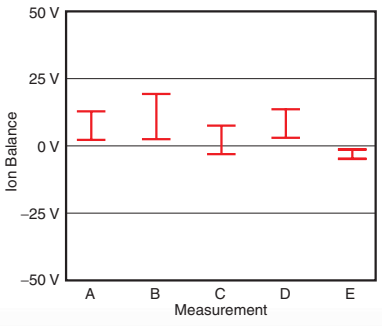
Negative mode

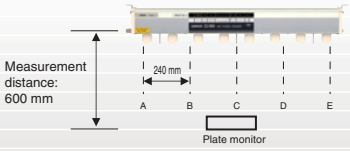
Simple Operation Settings Using Remote Control

Once installed, the ZJ-BA Ionizer can be easily set up using a remote control.
ID numbers can be set to allow up to 16 ZJ-BA Ionizers to be set using one remote control.

Engineering Data

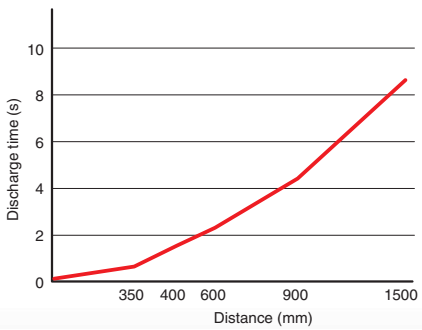
Ion Balance (Position Fluctuation Characteristics)





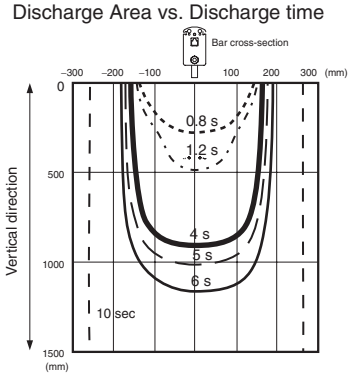
[Measurement conditions]
Airflow: 1 L/min per hole
Measurement time: 10 s
Plate monitor: 150 × 150 mm, 20 pF

Installation Distance vs. Discharge Time



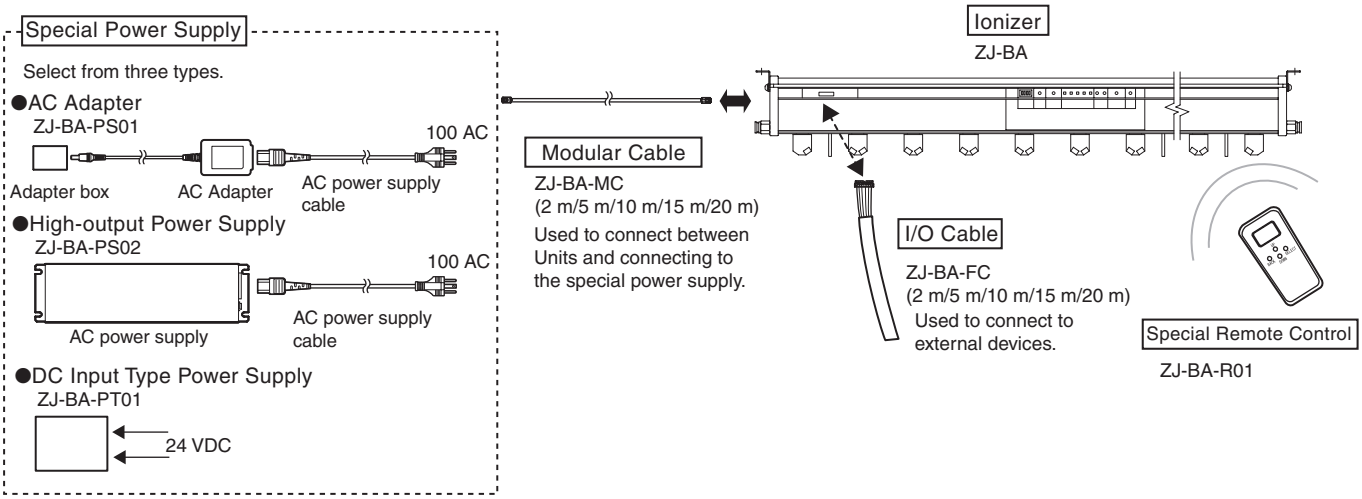
[Measurement conditions]
Airflow: 1 L/min per hole
Discharge time: From +1,000 V to +100 V
Plate monitor positioned in center of unit
Plate monitor: 150 x 150 mm, 20 pF

Discharge Area vs. Discharge time



Smart Function, Easy Operation

Product Configuration



The number of Units that can be connected depends on the type of power supply.

Ordering Information

Ionizers

Total length	Effective length	Model
490 mm	420 mm	ZJ-BA049
730 mm	660 mm	ZJ-BA073
970 mm	900 mm	ZJ-BA097
1210 mm	1140 mm	ZJ-BA121
1450 mm	1380 mm	ZJ-BA145
1690 mm	1620 mm	ZJ-BA169
1930 mm	1860 mm	ZJ-BA193
2170 mm	2100 mm	ZJ-BA217
2410 mm	2340 mm	ZJ-BA241
2650 mm	2580 mm	ZJ-BA265

Modular Cables

Cable length	Model
2 m	ZJ-BA-MC02
5 m	ZJ-BA-MC05
10 m	ZJ-BA-MC10
15 m	ZJ-BA-MC15
20 m	ZJ-BA-MC20

I/O Cables

Cable length	Model
2 m	ZJ-BA-FC02
5 m	ZJ-BA-FC05
10 m	ZJ-BA-FC10
15 m	ZJ-BA-FC15
20 m	ZJ-BA-FC20

Special Power Supplies

Product	Model
AC Adapter	ZJ-BA-PS01
High-output Power Supply	ZJ-BA-PS02
DC Input Type Power Supply	ZJ-BA-PT01

Special Remote Control

Model
ZJ-BA-R01

Discharger Modules

Specifications	Model
Single-pole, set of 2	ZJ9-BA-NT102
Double-pole, set of 2	ZJ9-BA-NT202

Replacement Dischargers

Specifications	Model
Set of 4	ZJ9-NDT04
Set of 8	ZJ9-NDT08

Cleaning Jigs

Specifications	Model
Set of 20	ZJ9-BA-CT01

Specifications

Special Power Supplies

Item \ Model	ZJ-BA-PS01 (AC Adapter)	ZJ-BA-PS02 (High-output Power Supply)	ZJ-BA-PT01 (DC-input Power Supply)
Number of connectable units	2	8	2
Input voltage	100 VAC ±10%		24 VDC ±10%
Input current	0.5 A max. (with 2 Units connected)	1.5 A max. (with 8 Units connected)	1.0 A max. (with 2 Units connected)
Output voltage	12 VDC		
Product Configuration	Adapter Box AC Adapter AC Power Supply Cable Instruction sheet	Power Supply Unit AC Power Supply Cable Instruction sheet	Power Supply Unit Instruction sheet
Weight (not including packaging)	Adapter Box: Approx. 30 g AC Adapter: Approx. 130 g AC Power Supply Cable: Approx. 250 g	Power Supply Unit: Approx. 1300 g AC Power Supply Cable: Approx. 250 g	Power Supply Unit: Approx. 220 g

Special Remote Control

Item \ Model	ZJ-BA-R01
Communications method	Wireless communications
Number of detectable Units	16
Power supply	Three AAA batteries
Weight (not including packaging)	Approx. 150 g
Accessories	Three batteries, instruction sheet

Specifications

Ionizers

Item \ Model	ZJ-BA049	ZJ-BA073	ZJ-BA097	ZJ-BA121	ZJ-BA145	ZJ-BA169	ZJ-BA193	ZJ-BA217	ZJ-BA241	ZJ-BA265
Power supply voltage	12 VDC ±10% ripple (peak-to-peak) 10% or less									
Current consumption	600 mA max.									
Discharge method	Dual-mixing variable-DC method									
Discharge voltage	±6.5 KV max.									
Discharger	Tungsten (See note 2.)									
Recommended installation distance	300 to 1500 mm									
Discharge time (See note 1.)	4.0 s max. (Zero balance mode)									
Ion balance (See note 1.)	±30 V max. (Zero balance mode)									
Power supply connector	Modular type, 4-pin connector (at both ends of Unit)									
Air inlet	6-dia. one-touch coupling (at right end of Unit)			6-dia. one-touch coupling (at both ends of Unit)						
Airflow	1 L/min. per hole (standard), Note: Air pressure: 0.3 Mpa									
External I/O: Inputs	Power ON/OFF inputs, Note: Switch inputs (Current when ON: Approx. 9 mA)									
External I/O: Outputs	Cleaning output, alarm output, and power output. Note: Signal output by photo-MOS relay (24 VDC, 100 mA max.)									
Indications	Power supply, ion output, cleaning, alarm, ion balance mode, and balance lock									
Group number	Fixed to 0 in factory settings.									
ID number	0 to 15 (Set via 4-position DIP switch)									
Ion balance mode	Select from zero balance, positive high, positive low, negative high, and negative low.									
Ion balance fine tuning function	Yes									
Ambient temperature	Operating: 5 to 40°C, storage: 0 to 40°C (with no icing or condensation)									
Ambient humidity	Operating: 35% to 65%, storage: 35% to 85% (with no condensation)									
Weight (Ionizer only)	Approx. 0.9 kg	Approx. 1.2 kg	Approx. 1.5 kg	Approx. 1.9 kg	Approx. 2.2 kg	Approx. 2.6 kg	Approx. 2.9 kg	Approx. 3.3 kg	Approx. 3.7 kg	Approx. 4.0 kg
Accessories	Ionizer, 2 mounting brackets (with M4 screws), 2 brackets, User's manual, English warning label			Ionizer, 2 mounting brackets (with M4 screws), 3 brackets, User's manual, English warning label			Ionizer, 2 mounting brackets (with M4 screws), 4 brackets, User's manual, English warning label			

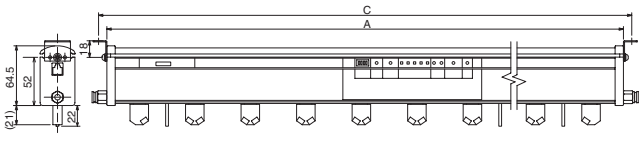
Note 1: Measurement conditions: Installation distance: 300 mm, Airflow: 1 L/min per hole (air pressure: 0.3 Mpa), Measurement location: Center and left and right ends of effective length of Ionizer, Discharge time: Ion balance measurement time from 1,000 V to 100 V/-1,000 V to -100V: 10 s, Plate monitor: 150 × 150 20 pF
2: Polysilicone Dischargers are also available. Contact your OMRON representative for details.

Dimensions

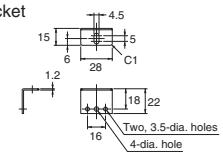
(Unit: mm)

Ionizers

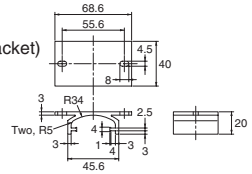
ZJ-BA



Mounting bracket



Bracket
(Supplementary bracket)

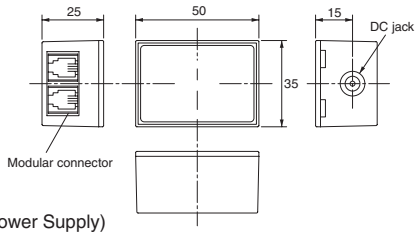


Note: The following table shows the differences in dimensions for each model.

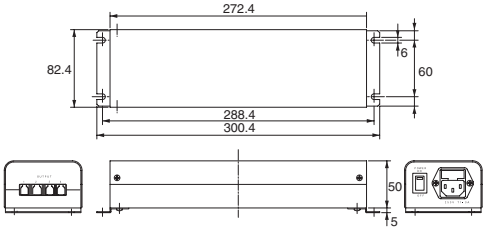
Model	A (mm)	B (mm)	C (mm)	Number of needles	Number of Discharger Modules
ZJ-BA049	490	420	508	14	8
ZJ-BA073	730	660	748	22	12
ZJ-BA097	970	900	988	30	16
ZJ-BA121	1210	1140	1228	38	20
ZJ-BA145	1450	1380	1468	46	24
ZJ-BA169	1690	1620	1708	54	28
ZJ-BA193	1930	1860	1948	62	32
ZJ-BA217	2170	2100	2188	70	36
ZJ-BA241	2410	2340	2428	78	40
ZJ-BA265	2650	2580	2668	86	44

Special Power Supplies

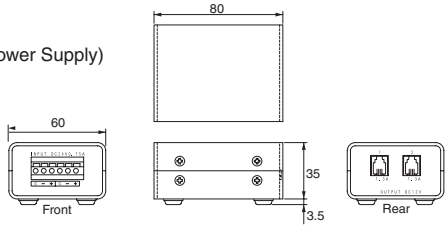
ZJ-BA-PS01 (AC Adapter/Adapter Box)



ZJ-BA-PS02 (High-output Power Supply)

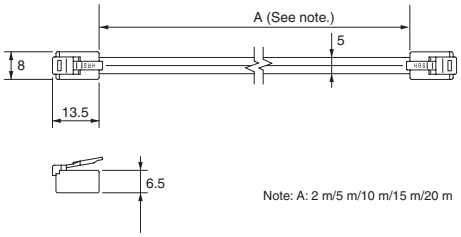


ZJ-BA-PT01 (DC-input Power Supply)



Modular Cables

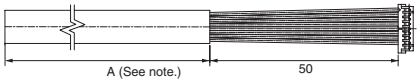
ZJ-BA-MC



Note: A: 2 m/5 m/10 m/15 m/20 m

I/O Cables

ZJ-BA-FC□□



Note: A: 2 m/5 m/10 m/15 m/20 m

KS1

from the FACTORY

Ionizer
Air Push Type
KS1

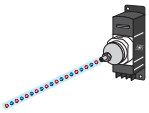
Wide Range of Nozzles for Optimal Ionization

From pin-point to wide-area ionization,
the optimal ionization for the application is now possible.

Select the Nozzle for the Application

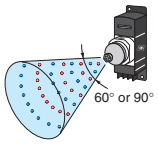
●Standard Nozzle

- An application example of the basic standard nozzle.



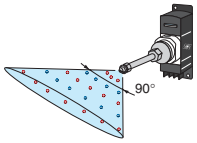
●Shower Nozzle

- Injects ionized air over an angle of 60° or 90°.



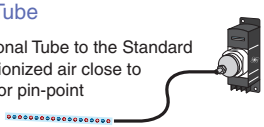
●Flat Nozzle

- Injects ionized air over an angle of 90° to enable ionization of comparatively wide objects.



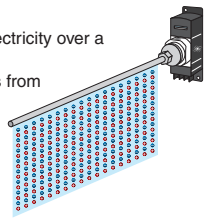
●Combination of Standard Nozzle and Optional Tube

- Attach the Optional Tube to the Standard Nozzle to blow ionized air close to the workpiece for pin-point ionization.



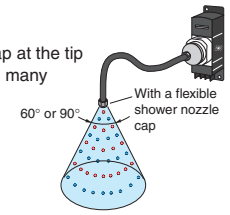
●Straight Bar Nozzle

- Neutralizes static electricity over a wide area.
- Five ionization areas from 100 to 500 mm.



●Combination of Flexible Tube Nozzle and Optional Cap

- Combine the nozzle cap at the tip of the nozzle to enable many ionization applications.



Efficient Pin-point Ionization

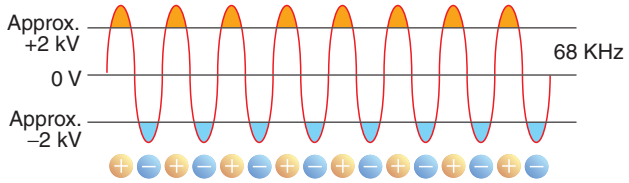
High-speed ionization of the target spot is possible by using a tube or metal pipe to get closer to the workpiece.
The Ionizer can be brought as close as 1 mm to the workpiece.

24-VDC Power Supply with No High-voltage Wiring Required

Only the 24-VDC power supply for the Ionizer is needed.
No dangerous high-voltage wiring is required.

High-frequency AC Method with Excellent Ion Balance

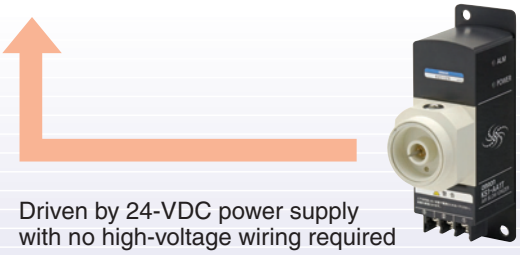
Uses more compact high-frequency AC method with excellent ion balance and stability.



Compact Type with Built-in Controller

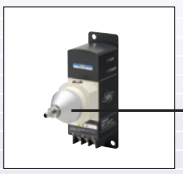
Controller section built in. Simple all-in-one Unit that installs easily just about anywhere.

The Ionizer oscillates at a much higher frequency (68 kHz) than the previous AC method to generate high-density ions.
Noise generation is also reduced by a ±2 kV low-voltage corona discharge.



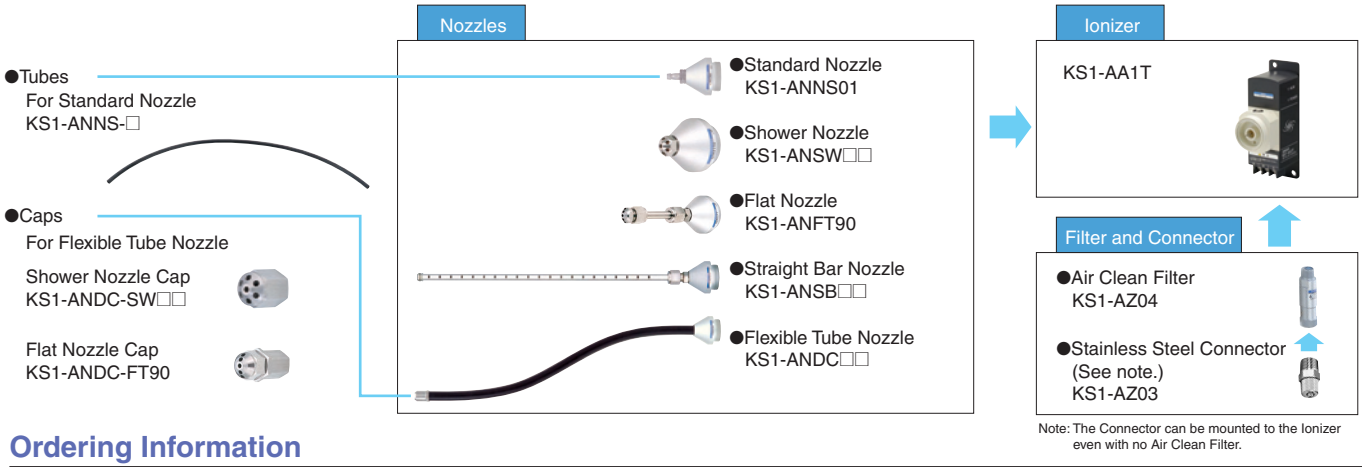
Driven by 24-VDC power supply with no high-voltage wiring required

●With standard nozzle



Safe because the high-voltage parts are covered by the nozzle.

Product Configuration



Note: The Connector can be mounted to the Ionizer even with no Air Clean Filter.

Ordering Information

Ionizer

Model
KS1-AA1T

Nozzles

Product		Model
Standard Nozzle		KS1-ANNS01
Shower Nozzle	60°	KS1-ANSW60
	90°	KS1-ANSW90
90° Flat Nozzle		KS1-ANFT90
Straight Bar Nozzle	100 mm	KS1-ANSB10
	200 mm	KS1-ANSB20
	300 mm	KS1-ANSB30
	400 mm	KS1-ANSB40
	500 mm	KS1-ANSB50
Flexible Tube Nozzle	100 mm	KS1-ANDC10
	200 mm	KS1-ANDC20
	300 mm	KS1-ANDC30
	400 mm	KS1-ANDC40
	500 mm	KS1-ANDC50

Tubes

Product	Model
500-mm Conductive Urethane Tube	KS1-ANNS-U
500-mm Fluororesin Tube	KS1-ANNS-F
500-mm Silicone Tube	KS1-ANNS-S

Caps

Product	Model
60° Flexible Shower Nozzle Cap	KS1-ANDC-SW60
90° Flexible Shower Nozzle Cap	KS1-ANDC-SW90
90° Flexible Flat Nozzle Cap	KS1-ANDC-FT90

Optional Products

Product	Model
Replacement Dischargers (set of 5)	KS1-AZ01T
Tool for Replacing Dischargers	KS1-AZ02
Stainless Steel Connector	KS1-AZ03
Air Clean Filter	KS1-AZ04

Specifications

Ionizer

Item \ Model	KS1-AA1T
Power supply voltage	24 VDC ±5%
Current consumption	Approx. 100 mA
Discharge method	High-frequency AC (Approx. 6.8 kHz)
Output voltage	±2 kV
Safety circuit	Outputs alarms for ionization errors
Discharge time	0.8 s max. (at a distance of 50 mm from air outlet)
Ion balance	±15 V or less (at a distance of 50 mm from air outlet)
Fluid used	Air (refer to Applicable Air)
Amount of generated ozone	0.04 ppm or less (when standard nozzle used, at a distance of 300 mm from air outlet and primary side voltage of 0.25 Mpa)
Supplied air flow	Approx. 100 L/min (ANR) (when standard nozzle used, at primary side voltage of 0.15 Mpa)
Indicators	Green POWER indicator lit while Ionizer ON, red ALM indicator lit for ionizing errors.
Air pressure range	When Standard Nozzle or Flexible Tube Nozzle is used. 0.02 to 0.25 MPa
	When Standard Nozzle Tube is attached. 0.02 to 0.12 MPa
	When Shower Nozzle, Flat Nozzle, or Straight Bar Nozzle is used. 0.05 to 0.40 MPa
Operating ambient temperature	0 to 40°C (with no condensation or icing)
Operating ambient humidity	35% to 65% (with no condensation)
Weight	235 g (Ionizer only)
Accessories	One ground lead (2 m)

Air Clean Filter

Item \ Model	KS1-AZ04
Fluid used	Air
Connection aperture	R(Rc)1/8
Collected particle size	0.1 µm
Collection efficiency	99.9%
Volume of air processed	40 l/min (ANR) (See note.)
Film area	29.9 cm^2
Max. voltage used	0.97 MPa
Withstanding pressure	1.47 MPa
Operating temperature range	5 to 45°C
Weight	11 g
Recommended tightening torque	400 to 600 N·cm
Unit material	Aluminum alloy (alumite treated)
Element material	Porous, hollow thread membrane

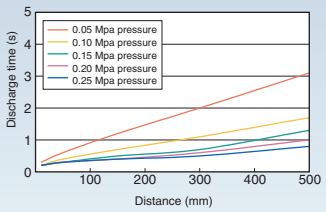
Note: At 0.7 Mpa (pressure drop of 0.03 Mpa)

Air Used

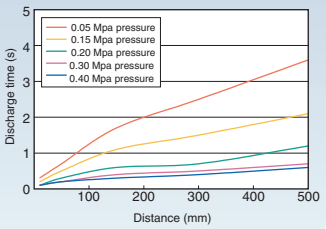
1. Make sure the pipes are adequately flushed with compressed air before connection. The pipes may become clogged or malfunctions may occur if the air in the pipes is contaminated by chips, sealing tape, rust, or other impurities.
2. Use air that does not contain oil or water. We recommend using clean dry air with a dew point of −10°C or lower and a maximum collected particle size of 0.01 µm.
3. Application is not possible if the air or the surrounding atmosphere contains organic solvents, phosphate hydraulic oil, sulfur dioxide, chlorine gas, acid or similar substance.

Discharge Characteristics (Typical)

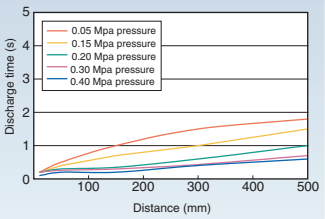
Standard Nozzle
KS1-ANNS01



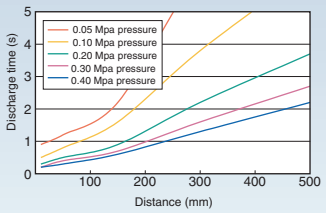
60° Shower Nozzle
KS1-ANSW60



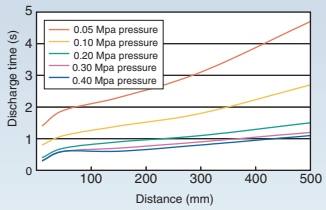
90° Shower Nozzle
KS1-ANSW90



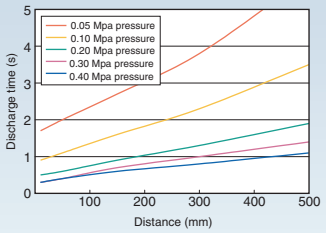
Flat Nozzle
KS1-ANFT90



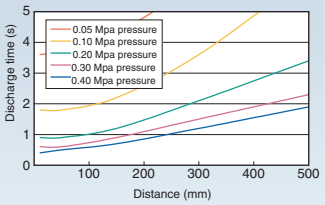
100-mm Straight Bar Nozzle
KS1-ANSB10



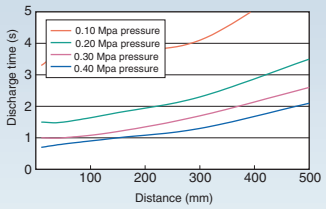
200-mm Straight Bar Nozzle
KS1-ANSB20



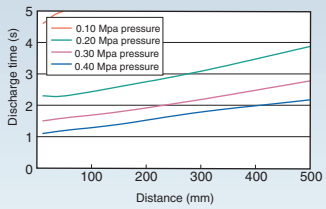
300-mm Straight Bar Nozzle
KS1-ANSB30



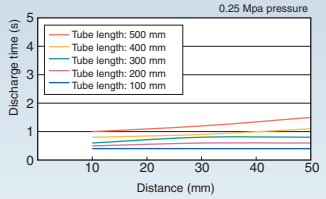
400-mm Straight Bar Nozzle
KS1-ANSB40



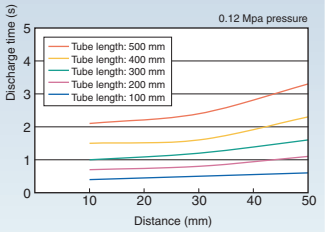
500-mm Straight Bar Nozzle
KS1-ANSB50



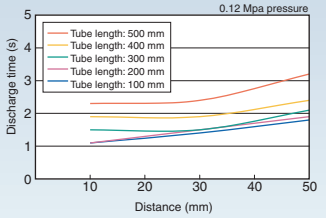
Flexible Tube Nozzle
KS1-ANDC□



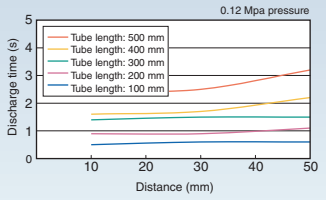
KS1-ANNS-U□ Connected to KS1-ANNS01
Standard Nozzle with Conductive Urethane Tube



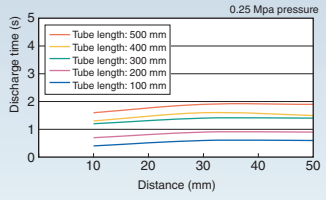
KS1-ANNS-F□ Connected to KS1-ANNS01
Standard Nozzle with Fluororesin Tube



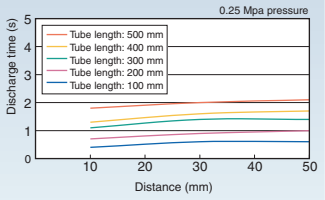
KS1-ANNS-S□ Connected to KS1-ANNS01
Standard Nozzle with Silicon Tube



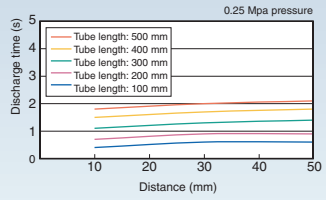
KS1-ANDC-SW60 Connected to KS1-ANDC□
Flexible Tube and 60° Shower Nozzle Cap



KS1-ANDC-SW90 Connected to KS1-ANDC□
Flexible Tube and 90° Shower Nozzle Cap



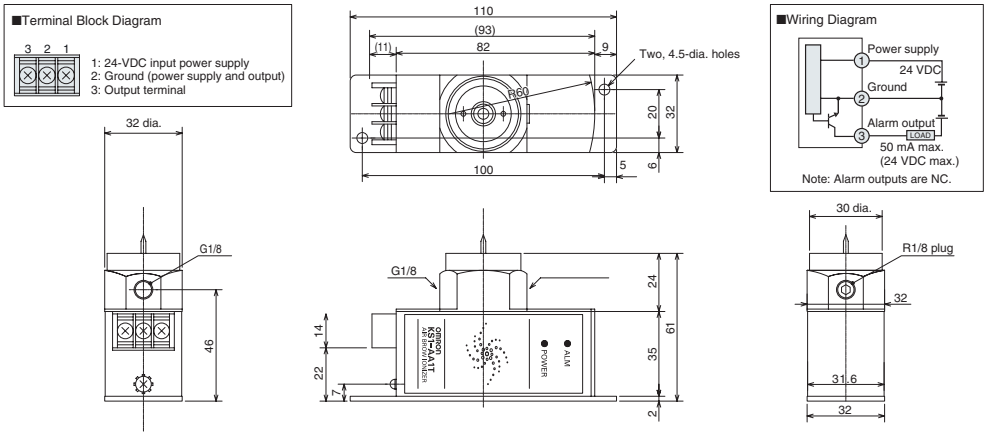
KS1-ANDC-FT90 Connected to KS1-ANDC□
Flexible Tube and Flat Nozzle Cap



Dimensions

(Unit: mm)

Ionizer

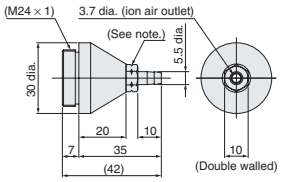


Nozzles and Optional Products Used with the Ionizer

Nozzles

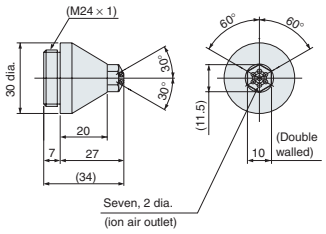
Standard Nozzle

KS1-ANNS01



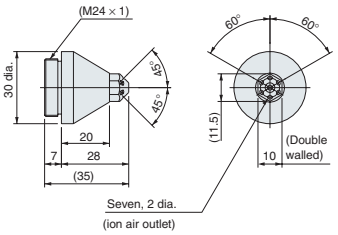
60° Shower Nozzle

KS1-ANSW60



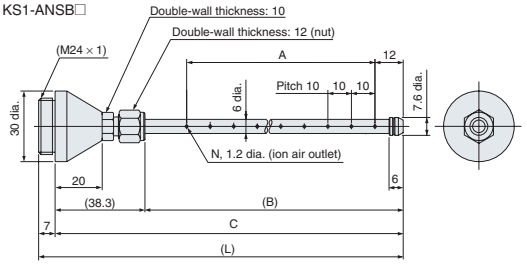
90° Shower Nozzle

KS1-ANSW90



Straight Bar Nozzles

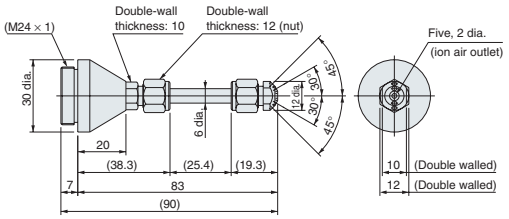
KS1-ANSB□



Model	A	B	C	L	N
KS1-ANSB10	100	129.7	168	175	11
KS1-ANSB20	200	229.7	268	275	21
KS1-ANSB30	300	329.7	368	375	31
KS1-ANSB40	400	429.7	468	475	41
KS1-ANSB50	500	529.7	568	575	51

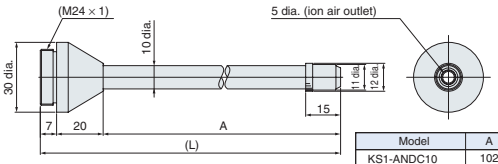
Flat Nozzle

KS1-ANFT90



Flexible Tube Nozzles

KS1-ANDC□

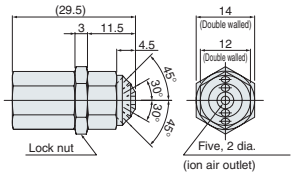


Model	A	L
KS1-ANDC10	102	129
KS1-ANDC20	202	229
KS1-ANDC30	302	329
KS1-ANDC40	402	429
KS1-ANDC50	502	529

Caps

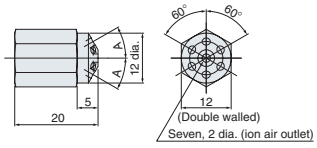
Flexible Flat Nozzle Cap

KS1-ANDC-FT90



Flexible Shower Nozzle Caps

KS1-ANDC-SW□

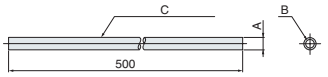


Model	Type	A
KS1-ANDC-SW60	60°	30°
KS1-ANDC-SW90	90°	45°

Optional Tubes

Optional Tubes for Standard Nozzles

KS1-ANNS-□

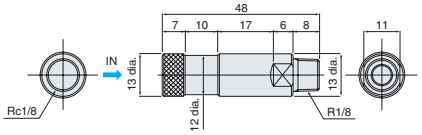


Model	A	B	C
KS1-ANNS-U	6 dia.	4 dia.	Conductive Urethane Tube
KS1-ANNS-F	7 dia.	5 dia.	Fluororesin Tube
KS1-ANNS-S	7 dia.	4 dia.	Silicon Tube

Optional Products

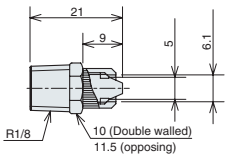
Optional Air Clean Filter

KS1-AZ04



Stainless Steel Connector

KS1-AZ03



- Attached to the Ionizer for air tube connection.
- If using products from other manufacturers, consider using stainless steel products for less impact on the ozone layer.

Terms and Conditions of Sale

1. Offer; Acceptance. These terms and conditions (these "Terms") are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "Products") by Omron Electronics LLC and its subsidiary companies ("Omron"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
2. Prices; Payment Terms. All prices stated are current, subject to change without notice by Omron. Omron reserves the right to increase or decrease prices on any unshipped portions of outstanding orders. Payments for Products are due net 30 days unless otherwise stated in the invoice.
3. Discounts. Cash discounts, if any, will apply only on the net amount of invoices sent to Buyer after deducting transportation charges, taxes and duties, and will be allowed only if (i) the invoice is paid according to Omron's payment terms and (ii) Buyer has no past due amounts.
4. Interest. Omron, at its option, may charge Buyer 1-1/2% interest per month or the maximum legal rate, whichever is less, on any balance not paid within the stated terms.
5. Orders. Omron will accept no order less than $200 net billing.
6. Governmental Approvals. Buyer shall be responsible for, and shall bear all costs involved in, obtaining any government approvals required for the importation or sale of the Products.
7. Taxes. All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Omron or required to be collected directly or indirectly by Omron for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Omron.
8. Financial. If the financial position of Buyer at any time becomes unsatisfactory to Omron, Omron reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Omron may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
9. Cancellation; Etc. Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Omron against all related costs or expenses.
10. Force Majeure. Omron shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
11. Shipping; Delivery. Unless otherwise expressly agreed in writing by Omron:
    a. Shipments shall be by a carrier selected by Omron; Omron will not drop ship except in "break down" situations.
    b. Such carrier shall act as the agent of Buyer and delivery to such carrier shall constitute delivery to Buyer;
    c. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid;
    d. Delivery and shipping dates are estimates only; and
    e. Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
12. Claims. Any claim by Buyer against Omron for shortage or damage to the Products occurring before delivery to the carrier must be presented in writing to Omron within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Products from Omron in the condition claimed.
13. Warranties. (a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied. (b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses 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. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty. See http://oeweb.omron.com or contact your Omron representative for published information.
14. Limitation on Liability; Etc. OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY. Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.
15. Indemnities. Buyer shall indemnify and hold harmless Omron Companies and their employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Omron is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless Omron and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
16. Property; Confidentiality. Any intellectual property in the Products is the exclusive property of Omron Companies and Buyer shall not attempt to duplicate it in any way without the written permission of Omron. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Omron. All information and materials supplied by Omron to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
17. Export Controls. Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (iii) sale of products to "forbidden" or other proscribed persons; and (ii) disclosure to non-citizens of regulated technology or information.
18. Miscellaneous. (a) Waiver. No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) Assignment. Buyer may not assign its rights hereunder without Omron's written consent. (c) Law. These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) Amendment. These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) Severability. If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) Setoff. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) Definitions. As used herein, "including" means "including without limitation"; and "Omron Companies" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

Certain Precautions on Specifications and Use

1. Suitability of Use. Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
   (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
   (ii) Use in consumer products or any use in significant quantities.
   (iii) 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.
   (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this Product.
   NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON'S PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
2. Programmable Products. Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
3. Performance Data. Data presented in Omron Company websites, catalogs and other materials 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 user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.
4. 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 part 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 part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.
5. Errors and Omissions. Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

OMRON

Complete "Terms and Conditions of Sale" for product purchase and use are on Omron's website at www.omron.com/oei – under the "About Us" tab, in the Legal Matters section.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

OMRON

OMRON ELECTRONICS LLC
One Commerce Drive
Schaumburg, IL 60173
847-843-7900
For US technical support or other inquiries:
800-556-6766

OMRON CANADA, INC.
885 Milner Avenue
Toronto, Ontario M1B 5V8
416-286-6465

OMRON ON-LINE
Global - http://www.omron.com
USA - http://www.omron.com/oei
Canada - http://www.omron.ca

Cat. No. E374-E1-02 8/06 Specifications subject to change without notice Printed in USA

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Omron:
KS1-ANSW90