

Smart Electrostatic Sensor ZJ-SD

CSM_ZJ-SD_DS_E_2_3

Smart Static Electricity Sensing: Making Static Electricity Visible



- Compact sensor head and smart digital amplifier measure the electrostatic charge quantity of workpieces at all times.
- Multi-point measurements and data logging of the static electricity quantity can be performed easily.
- Best long-distance, high-precision measurements in the industry



Refer to *Safety Precautions* on page 3.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Ordering Information

Electrostatic Sensor

Sensor Head

Appearance	Sensing distance	Model
	5 to 100 mm	ZJ-SD100

Amplifier

Appearance	Cable length	Power supply	Output method	Model
	2 m	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
	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.

Ratings and 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. *1
Display resolution		Standard mode: 10 V, Precision mode: 1 V *2
Linearity *3		$\pm 5\%$ FS *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 *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
Connecting 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)

*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).

Amplifier

Item	Model	ZJ-SDA11
Measurement period		1 ms
Possible average count settings *1		1, 2, 4, 8, 16, 32, 64, 128, 256, 512, or 1,024
Linear output *2		Current output: 4 to 20 mA/FS, Max. load resistance: 300 Ω Voltage output: ± 4 V (± 5 V, 1 to 5 V *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, 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 $\pm 10\%$, 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 M Ω (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
Connecting method		Pre-wired Connector (standard length: 2 m)
Weight (packed state)		Approx. 350 g
Materials		Case: PBT (polybutylene terephthalate), Cover: Polycarbonate
Accessories		Instruction sheet

*1. The response time of the linear outputs is calculated as follows: Measurement period \times (Average count setting + 1).

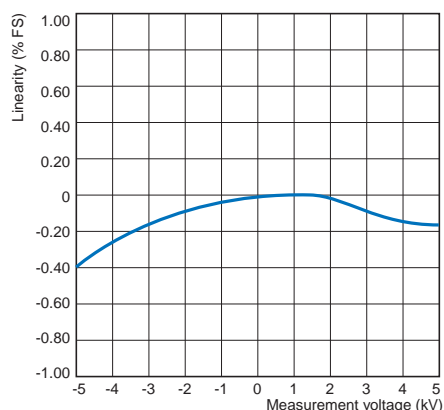
The response time of the judgment outputs is calculated as follows: Measurement period \times (Average count setting + 1).

*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.

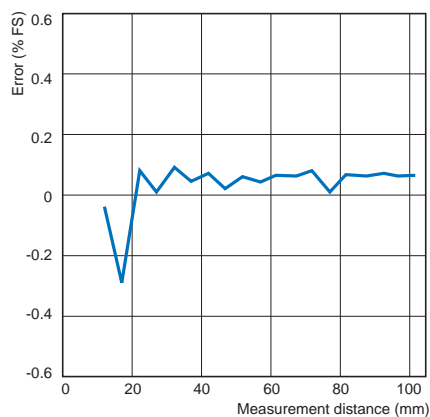
Engineering Data (Reference Value)

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.

Safety Precautions

WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



For technical information and product FAQs, refer to the *Technical Guide* on your OMRON website.

Precaution for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings.

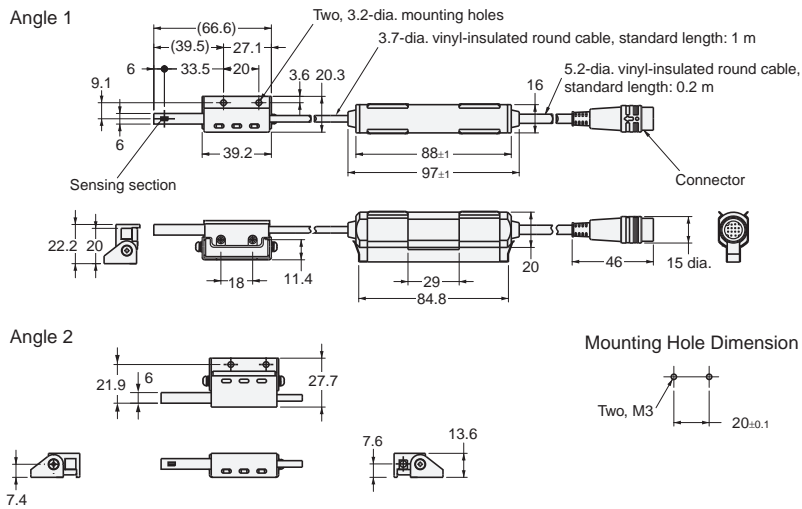
For details on information such as the usage precautions, refer to the *ZJ-SD Series Smart Electrostatic Sensor User's Manual* (Cat. No.: Z237).

Dimensions

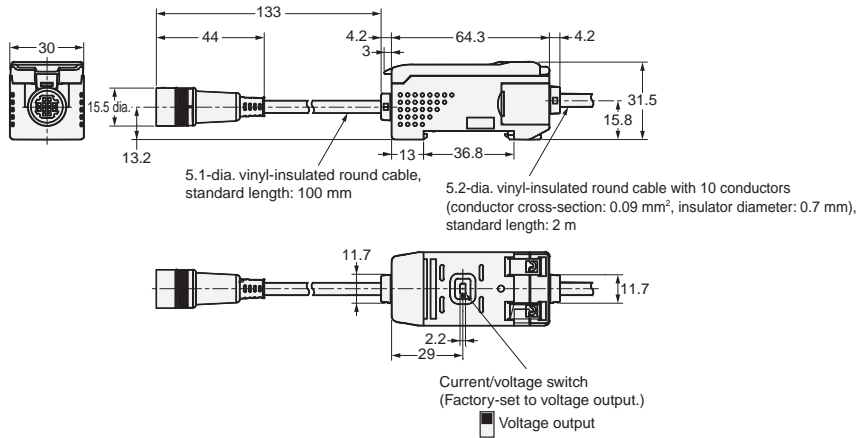
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Electrostatic Sensor

Sensor Head ZJ-SD100

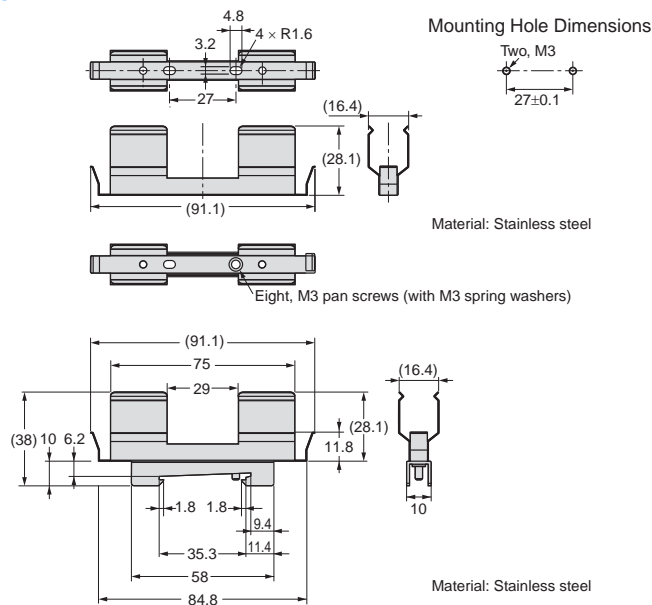


Amplifier ZJ-SDA11

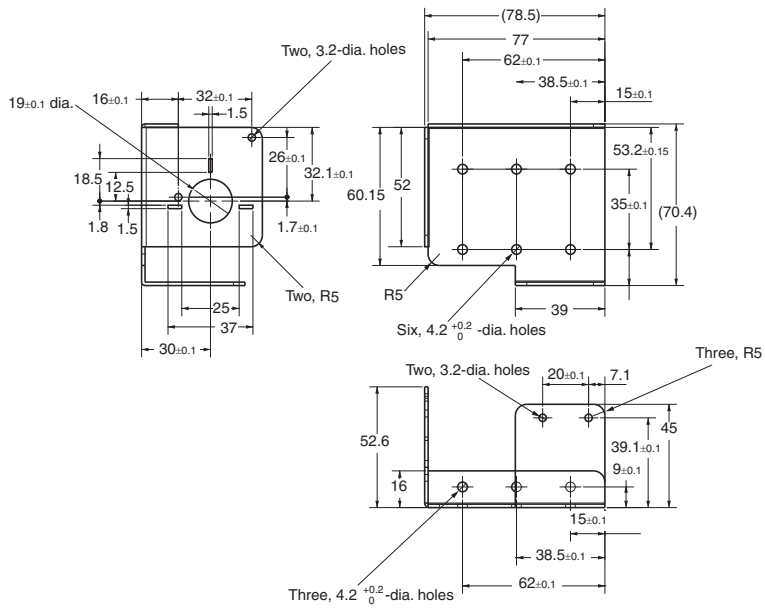


Accessories (Order Separately)

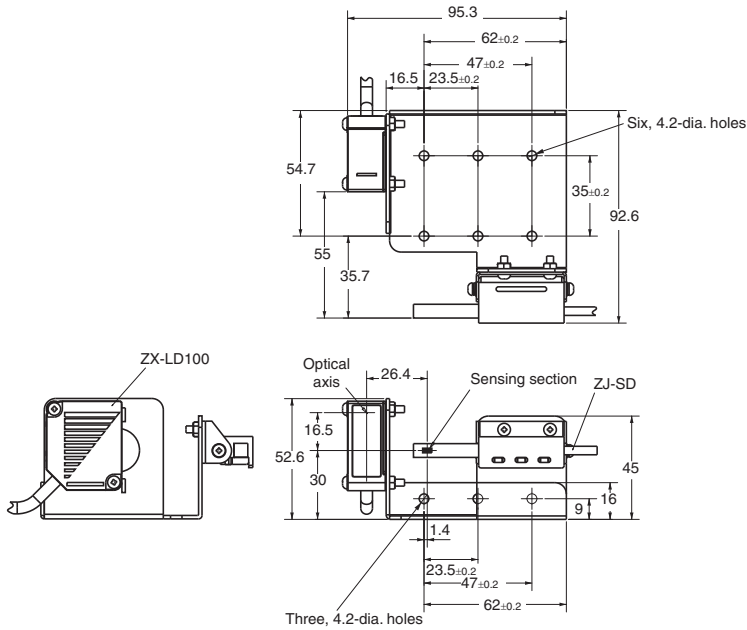
Pre-amplifier Mounting Brackets ZX-XBT1



Sensor Head Mounting Bracket for Distance Compensation
ZJ-XBU1



Dimensions with ZX-LD100 Sensor Head



Terms and Conditions Agreement

Read and understand this catalog.

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

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://www.omron.com/global/> or contact your Omron representative for published information.

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.

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.

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 PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

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.

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.

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.

2016.8

In the interest of product improvement, specifications are subject to change without notice.

OMRON Corporation
Industrial Automation Company

<http://www.ia.omron.com/>

(c)Copyright OMRON Corporation 2016 All Right Reserved.