

Smart Electrostatic Sensor

ZJ-SD

CSM_ZJ-SD_DS_E_2_4

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



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

Refer to *Safety Precautions* on page 3.

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
+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.

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 (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).

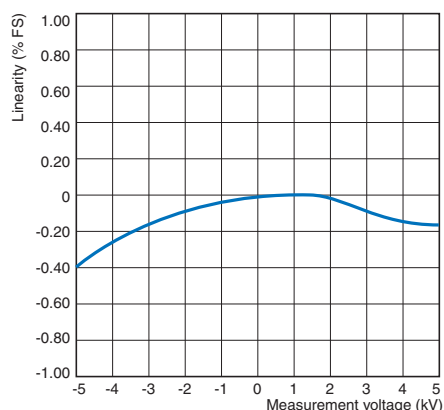
The response time of the judgment outputs is calculated as follows: Measurement period \times (Average count setting + 1).

*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.

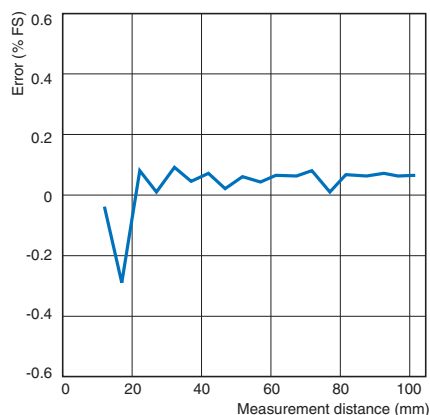
Engineering Data (Reference Value)

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.

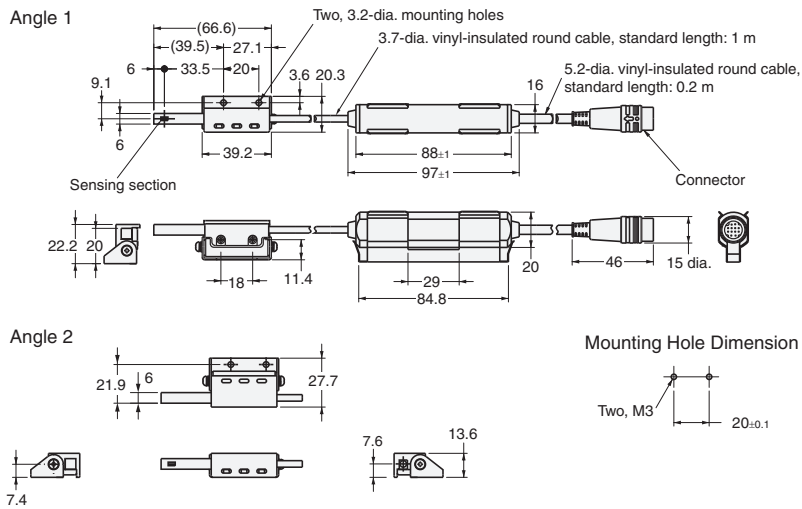
For details on information such as the usage precautions, refer to the *ZJ-SD Series Smart Electrostatic Sensor User's Manual* (Cat. No.: Z237).

Dimensions

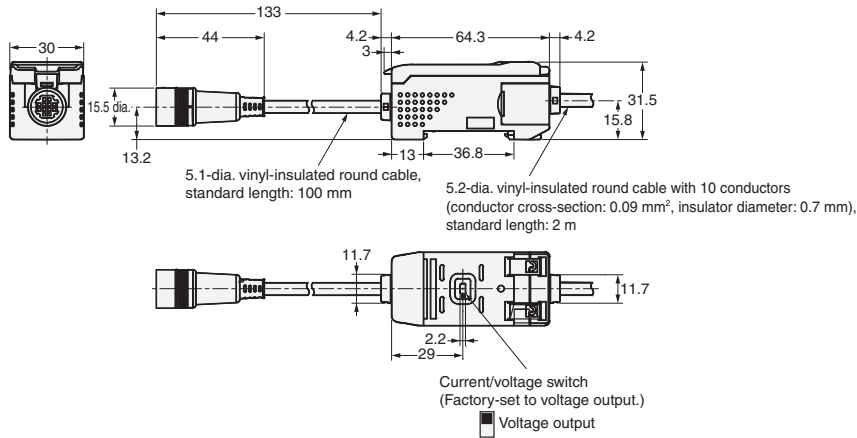
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Electrostatic Sensor

Sensor Head ZJ-SD100

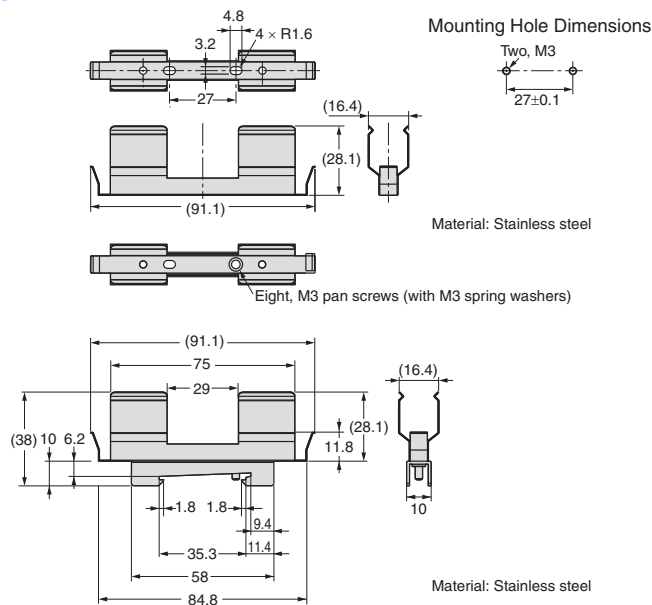


Amplifier ZJ-SDA11

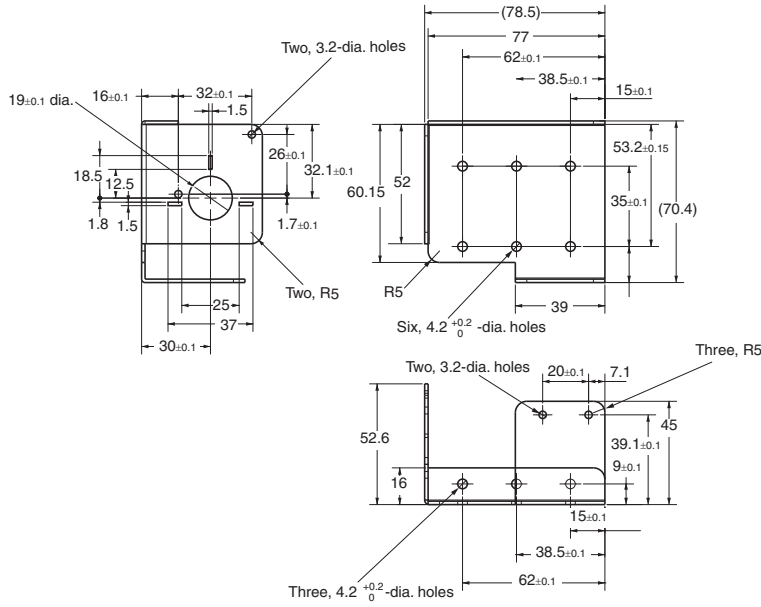


Accessories (Order Separately)

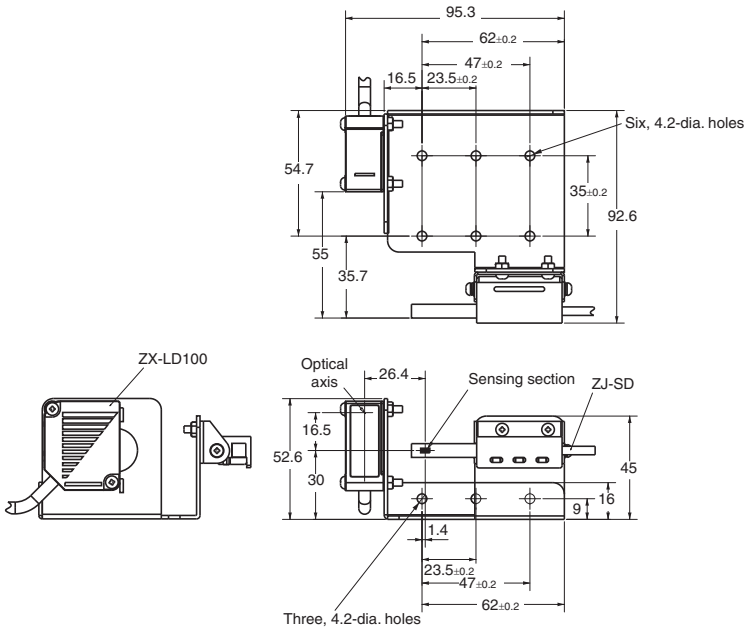
Pre-amplifier Mounting Brackets ZX-XBT1



Sensor Head Mounting Bracket for Distance Compensation
ZJ-XBU1



Dimensions with ZX-LD100 Sensor Head



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