



## Instruction Manual

## Electrostatic Sensor Monitor

## IZE110 / IZE111 / IZE112 / IZE113



The intended use of the electrostatic sensor monitor is to monitor and display electrostatic potential information from an electrostatic sensor.

## 1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)<sup>1)</sup>, and other safety regulations.

<sup>1)</sup> ISO 4414: Pneumatic fluid power - General rules relating to systems.  
ISO 4413: Hydraulic fluid power - General rules relating to systems.  
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)  
ISO 10218-1: Manipulating industrial robots - Safety, etc.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

	<b>Caution</b>	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	<b>Warning</b>	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	<b>Danger</b>	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

**Warning**

- Always ensure compliance with relevant safety laws and standards.**  
All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

## 2 Specifications

## 2.1 General specifications

Item	IZE11#	
Connected sensor	IZD10-110	IZD10-510
Rated measurement range	-0.4 kV to +0.4 kV <small>Note1</small>	-20 kV to +20 kV <small>Note2</small>
Minimum setting unit	0.001 kV	0.1 kV
Measurement distance	10 to 50 mm	25 to 75 mm
Power supply voltage	21.6 to 26.4 VDC (24 VDC $\pm$ 10%)	
Current consumption	50 mA or less (excluding sensor)	
Protection	Polarity protection	
Sensor input	Sensor input	1 to 5 VDC (input impedance 1 M $\Omega$ )
	Number of inputs	1 input
	Input protection	Protection against excess voltage (up to 26.4 V)
Hysteresis	Variable	
Window comparator mode	Variable	
Switch output	Switch output	NPN or PNP open collector (2 outputs)
	Max. load current	80 mA
	Max. applied voltage	30 VDC (NPN output)
	Residual voltage	1 V or less (load current 80 mA)
	Protection	Short circuit protection
Analogue output	Response time (including sensor)	100 ms or less (with anti-chatter function: 500 ms, 1 s, 2 s or less)
	Voltage output	1 to 5 V (within rated pressure range) Output impedance: approx. 1 k $\Omega$
	Current output	4 to 20 mA (within rated pressure range) Max. load impedance: 600 $\Omega$ (at 24 VDC) Min. load impedance: 50 $\Omega$
	Accuracy	$\pm$ 1% F.S. (at 25°C)
	Response time	200 ms or less (without filter) 1.5 s or less (with filter)
Display	Display accuracy	$\pm$ 0.5% F.S. $\pm$ 1 digit
	Display type	3 1/2 digits, 7 segment display 2 colour (red / green) Sample cycle: 5 times / sec.
	Indicator light	OUT1: LED ON when output ON (green) OUT2: LED ON when output ON (red)
Environmental	Enclosure rating	IP40
	Ambient temperature range	Operation: 0 to 50°C Storage: -10 to 60°C (no condensation or freezing)
	Ambient humidity range	Operation / storage: 35 to 85% R.H. (no condensation)
	Withstand voltage	1000 VAC 1 minute Between live parts and enclosure
	Insulation resistance	50 M $\Omega$ or more (500 VDC mega) Between live parts and enclosure
	Vibration resistance	10 to 150Hz smaller of 1.5 mm or 98 m/s <sup>2</sup> double amplitude each in directions of X, Y, and Z for 2 hours (de-energizing)
	Impact resistance	100 m/s <sup>2</sup> 3 times each in directions of X, Y, and Z respectively (De-energizing)
Temp. characteristics	$\pm$ 0.5% F.S. or less (at 25°C)	
Connectors	Power and output: 5 pin connector Sensor: 4 pin e-CON connector	
Material	Front and rear case: PBT	
Weight	30 g (excluding cables)	

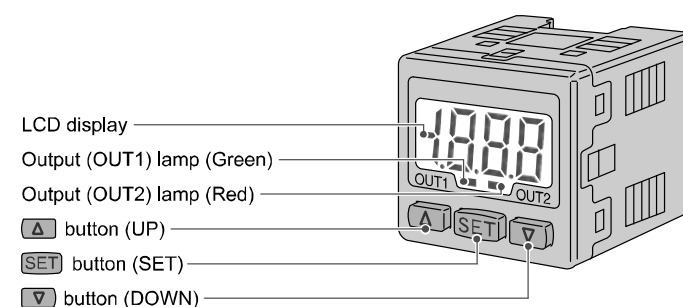
Note1) Rated measurement value when the distance between the charged object and the sensor is 25 mm.

Note2) Rated measurement value when the distance between the charged object and the sensor is 50 mm.

**Warning**

- Special products (-X) might have specifications different from those shown in this section. Contact SMC for specific drawings.

## 3 Names and function of parts



Part	Description
LCD display	Displays the current status of charged potential, setting mode conditions and error codes. Four display modes can be selected: display always in red or green only, or changing from green to red linked to the output.
Output OUT1 lamp (Green)	LED is ON when OUT1 is ON.
Output OUT2 lamp (Red)	LED is ON when OUT2 is ON.
UP button	Selects a mode and increases the ON/OFF value. Press this button to change to peak display mode.
DOWN button	Selects a mode and decreases the ON/OFF value. Press this button to change to bottom display mode.
SET button	Press this button to change mode and to confirm the set value.

## 4 Installation

## 4.1 Installation

**Warning**

- Do not install the product unless the safety instructions have been read and understood.**
- Tighten to the specified tightening torque.**  
If the tightening torque is exceeded the mounting screws, brackets and the product can be broken. Insufficient torque can cause displacement of the product from its correct position.
- Do not drop, hit or apply excessive shock to the product.**  
Otherwise damage to the internal parts can result, causing malfunction.
- Do not pull the lead wire forcefully, and do not lift the product by pulling the lead wire.**

## 4.2 Environment

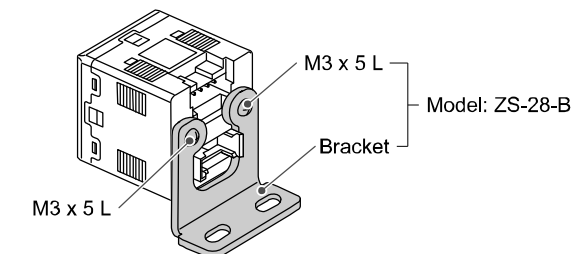
**Warning**

- Do not use in an environment where corrosive gases, oil, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.
- Take sufficient shielding measures when the product is to be used in the following conditions:
  - Where noise due to static electricity is generated.
  - Where electro-magnetic field strength is high.
  - Where radioactivity is present.
  - Where power lines are located.

## 4 Installation (continued)

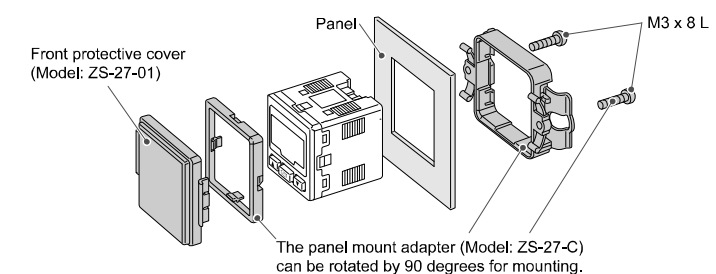
## 4.3 Mounting with Bracket

- Fix the bracket (part number ZS-28-B) to the monitor using the screws M3 x 5 L (2 pcs.) supplied, then mount the product in the required position.
- \* Tighten the bracket mounting screws to a torque of 0.5 to 0.7 N·m.



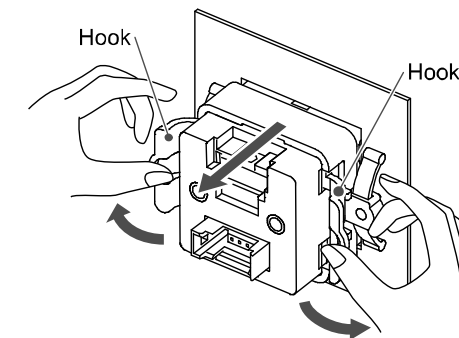
## 4.4 Mounting with Panel mount adapter

- Mount the panel mount adapter to the front of the monitor. Then insert the monitor with adapter into the panel until it comes into contact with the panel front surface.
- Fix the panel mount adapter to the monitor using the screws M3 x 8 L (2 pcs.) supplied.
- Panel mount adapter + Front protective cover (Part No.: ZS-27-D)



## 4.5 Removing the panel mounted controller

- When removing the monitor with panel mount adapter from the installation, pull it forward while expanding the hooks on each side as shown below.  
If the panel mount adapter is pulled forward with the hook caught, the monitor and adapter may be damaged.



## 5 Wiring

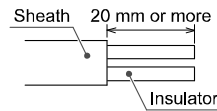
## 5.1 Wiring Connection

- Connections should be made with the power supply turned OFF.
- Connect wires and cables correctly and do not insert or remove the connectors with the power ON.
- Check the insulation of wires and cables.
- Use a separate route for the product wiring and any power or high voltage wiring. Otherwise, malfunction may result due to noise.
- Take appropriate measures against noise, such as noise filters, when the product is incorporated in equipment or devices.
- Do not use the product in a place where electric surges are generated.
- Use suitable surge protection when a surge generating load such as a solenoid valve are to be directly driven.

## 5 Wiring (continued)

### 5.2 Sensor Connector wiring

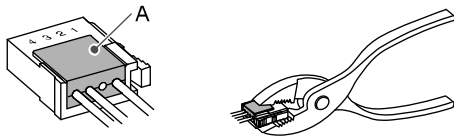
- Attach the connector to the lead wire. The sensor wire should be stripped as shown in the figure. Do not cut the insulator. Refer to the table below for corresponding connector and wire gauge.



- The core of the corresponding colour shown in the following table is put into the pin of the number marked on the connector to the bottom.

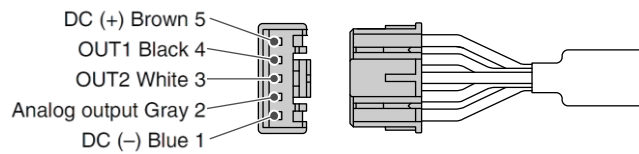
Pin Number	Signal	Wire colour
1	DC +	Brown
2	N.C.	-
3	DC -	Blue
4	IN: 1 to 5 VDC	White

- Check that the above-mentioned wire preparation has been performed correctly, then part A shown in the figure is pushed in by hand to make temporary connection.



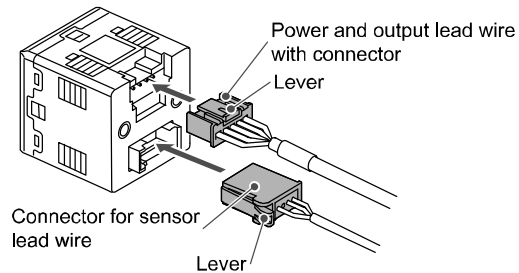
- Part A centre should be pressed straight in using a suitable tool, such as pliers. The e-CON connector cannot be re-used once it has been completely crimped.
- In case of connection failure or when a pin is mis-wired, always use a new e-CON connector.

### 5.3 Power and Output Connector pin layout



### 5.4 Connecting / Disconnecting

- When connecting the connector, insert it straight onto the pins while holding the lever and connector body and lock the connector into the square groove in the housing until the connector clicks.
- When removing the connector, press down the lever to disengage the lever claw and pull the connector straight out.

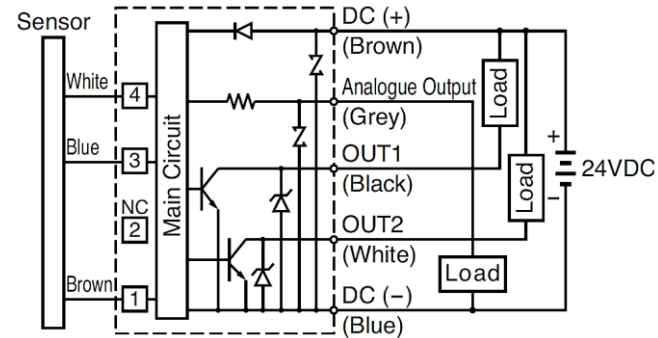


## 5 Wiring (continued)

### 5.5 Circuit diagrams

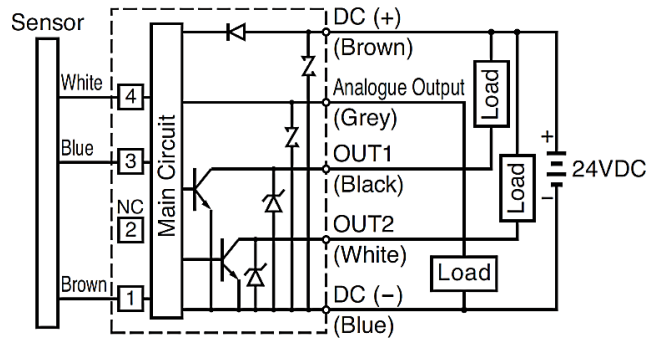
#### IZE110

NPN open collector output: 2 outputs  
 Maximum 30 V, 80 mA, Residual voltage: 1 V or less  
 Analogue output: 1 to 5 V, Output impedance: approx. 1 k $\Omega$



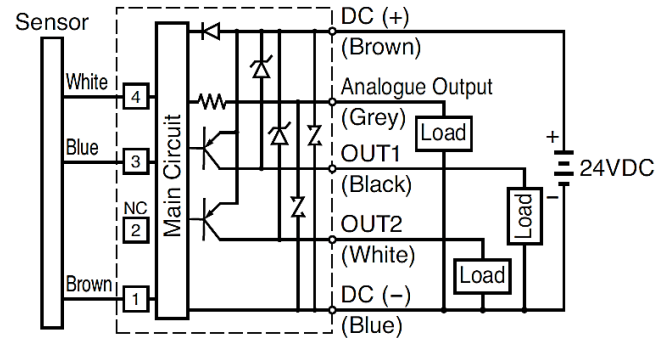
#### IZE111

NPN open collector output: 2 outputs  
 Maximum 30 V, 80 mA, Residual voltage: 1 V or less  
 Analogue output: 4 to 20 mA, Min. load impedance: 50  $\Omega$



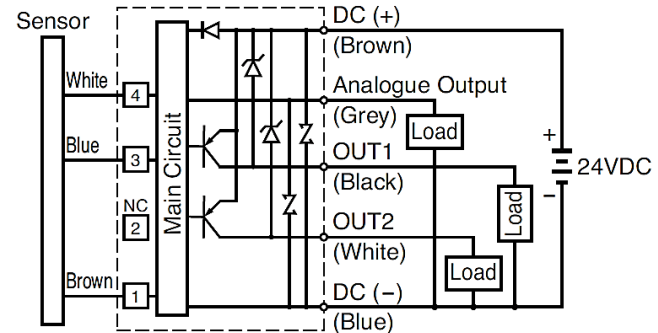
#### IZE112

PNP open collector output: 2 outputs  
 Maximum 80 mA, Residual voltage: 1 V or less  
 Analogue output: 1 to 5 V, Output impedance: approx. 1 k $\Omega$



#### IZE113

NPN open collector output: 2 outputs  
 Maximum 30 V, 80 mA, Residual voltage: 1 V or less  
 Analogue output: 4 to 20 mA, Min. load impedance: 50  $\Omega$



## 6 Outline Dimensions (mm)

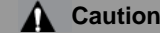
Refer to the operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for the Outline Dimensions.

## 7 How to Order

Refer to the operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for How to Order information.

## 8 Maintenance

### 8.1 General Maintenance



- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

## 9 Limitations of Use

### 9.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

## 10 Product disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

## 11 Contacts

Refer to [www.smcworld.com](http://www.smcworld.com) or [www.smc.eu](http://www.smc.eu) for your local distributor / importer.

# SMC Corporation

URL: <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)  
 SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan  
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