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SPECIFICATION FOR SUPPLIED PRODUCT

ROTARY POSITION SENSOR SV01C103BJZAE TYPE

REFERENCE ONLY
This specification is tentative at this moment and final
specification might be changed.

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1. Scope

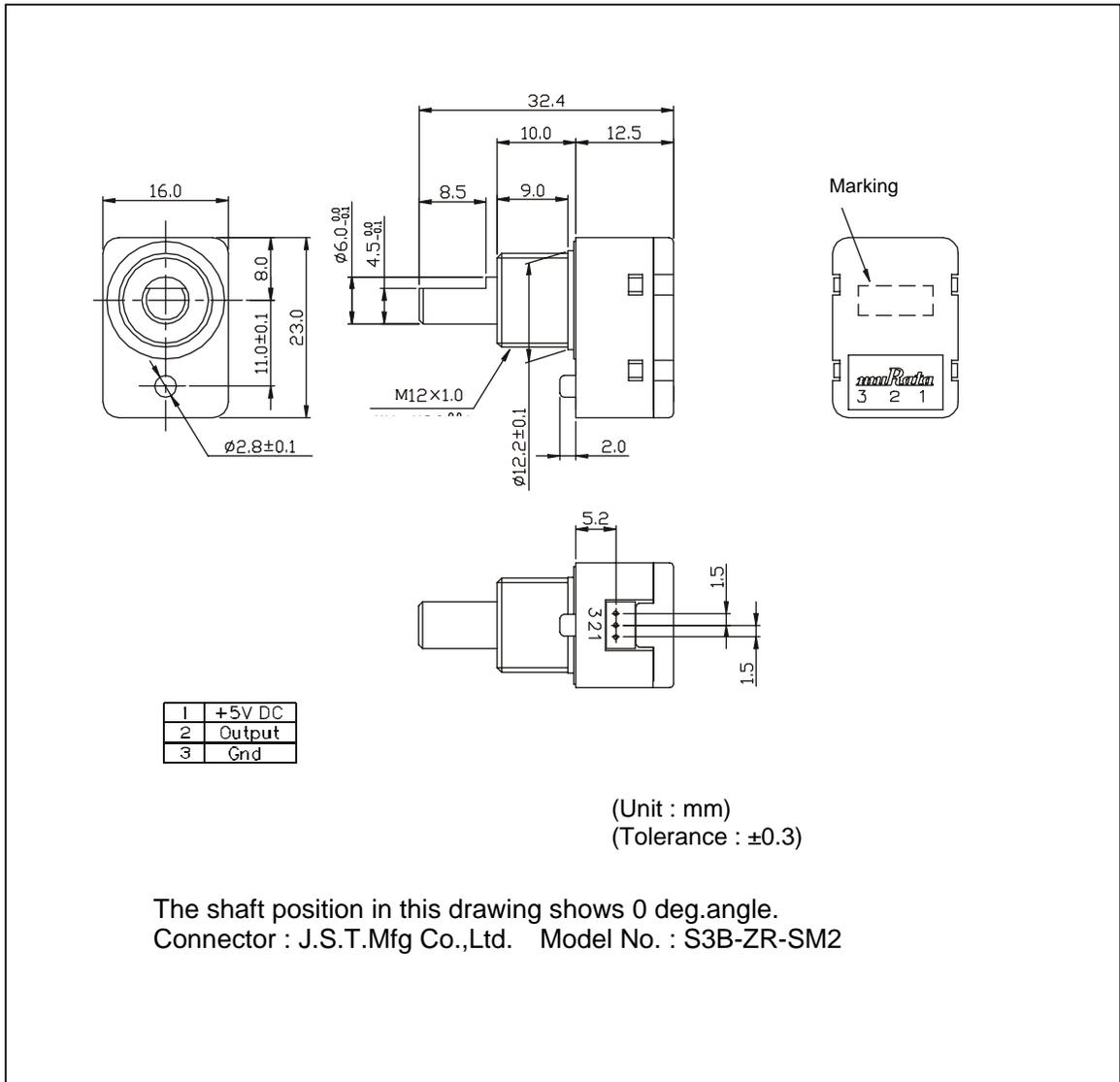
This specification is applied to Murata made Rotary Position Sensor **SV01C103BJZAE** type.
REFERENCE ONLY
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2. Part Number

SV01C103BJZAE00 Bulk : 50pcs./pack

Note) Fill in your part number on the cross-reference table.

3. Outline Dimensions and Marking



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4. Characteristics

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4.1 Electrical characteristics

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ITEM	SPECIFICATION	TEST METHOD
Standard total resistance range	10k ohm	-
Standard total resistance tolerance	±30% of standard total resistance value	-
Rated voltage	5p±0.5Vdc	-
Dielectric strength	250Vac, 1 minute, Leakage current less than 50μA	5.1
Operating temperature range	-10°C ~ +70°C	-
Insulation resistance	100Mohm min. (250Vdc)	5.2
Linearity	<p>B(Linear)</p> <p>The axial position B The axial position A The axial position C</p> <p>軸位置B 軸位置A 軸位置C</p> <p>Output voltage ratio (%)</p> <p>100</p> <p>86.0±3.0% (83.0~89.0%)</p> <p>50.0±3.0% (47.0~53.0%)</p> <p>14.0±3.0% (11.0~17.0%)</p> <p>0 -120 0 120</p> <p>Axial rotation angle [°]</p> <p>Output voltage ratio (%) = $\frac{\text{Voltage between terminals 2-3}}{\text{Voltage between terminals 1-3}}$</p>	

4.2 Mechanical characteristics

ITEM	SPECIFICATION	TEST METHOD
Electrical rotational angle	(Ref. : 333.3°)	-
Rotational torque	4mN·m (Ref.; 40gf·cm) max.	-
Vertical strength of the shaft	No mechanical deformation and damage	5.3
Edgewise strength of the shaft	0.42mm max. (The maximum shaped width)	5.4

4.3 Environmental characteristics

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ITEM	SPECIFICATION				TEST METHOD
	Total Resistance Change	Outputting point rate of change			
			The axial position B	The axial position C	
Humidity Load Life	±10%	50.0±4.0%	86.0±4.0%	14.0±4.0%	5.5
Load Life	±10%				5.6
Low Temperature Exposure	±10%				5.7
Temperature Cycle	±10%				5.8
Rotational life	±20%				5.9
Vibration	±10%				5.10

5. Test Method

The tests and measurements shall be conducted under the condition of 15~35°C of temperature 25~75% of relative humidity and 86~106 k pa of atmospheric pressure unless otherwise specified. In case when entertained a doubt in judgment obtained from results measured in accordance with the above mentioned conditions, the tests and measurements shall be conducted under the condition of 25±2°C of temperature and, 50±2% of relative humidity and 86~106 k pa of atmospheric pressure..

5.1 Dielectric strength

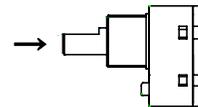
The voltage of 250Vac should be applied for 1 minute between a terminal and an axis.

5.2 Insulation resistance

The voltage of 250Vac should be applied between a terminal and an axis.

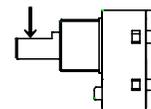
5.3 Vertical strength of the shaft

The static force of 50N(Ref.;5.1kgf) should be applied to the shaft in vertical direction of the shaft for 10 seconds.



5.4 Edgewise strength of the shaft

The bending moment of 50 mN · m(Ref.; 510gf) should be applied to shaft in the position of a tip of a shaft to 5mm.



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5.5 Humidity load life

Full rated continuous working voltage not exceeding 5Vdc should be applied intermittently between terminal #1 and terminal #3 of the rotary position sensor, 1.5 hours on and 0.5 hours off, for 96±4 hours in total in a chamber at a temperature of 40±2°C and the relative humidity of 90–95%. After removing from the chamber, the rotary position sensor should be kept in the dry box for 5±1/6 hours.

5.6 Load life

Full rated continuous working voltage not exceeding 5Vdc should be applied intermittently between terminal #1 and terminal #3 of the rotary position sensor, 1.5 hours on and 0.5 hours off, for 168±4 hours in total in a chamber at a temperature of 80±3°C . After removing from the chamber, the rotary position sensor should be kept in the dry box for 5±1/6 hours.

5.7 Low temperature exposure

The rotary position sensor should be stored in a chamber at a temperature of -40±3°C without loading for 168±4 hours. After removing from the chamber, the rotary position sensor should be kept in the dry box for 1~2 hours.

5.8 Temperature cycle

The rotary position sensor should be subjected to the following table temperature conditions for 20 cycles. Then, the rotary position sensor should be kept in the dry box for 1~2 hours.

Sequence	1	2	3	4
Temp.(°C)	-40±3	+25±2	+85±3	+25±2
Time (min.)	30	5 max.	30	5 max.

5.9 Rotational life

The shaft should be continuously rotated in 90° or more of effective electrical rotational angle at the rate of one cycle for 6 seconds for 1 Million cycles without loading. Then, the rotary position sensor should be kept in the dry box for 10±5 minutes.

5.10 Vibration

The rotary position sensor should be tested under the condition of the acceleration due to gravity 21.5 m/s² and oscillating frequency add vibration of 4000 cpm to three right-angled directions for 4 hours each mutually. Then, the rotary position sensor should be kept in the dry box for 1~2 hours.

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6.  Caution

- (1) Please consult with Murata factory representative prior to using our products for the applications requiring especially high reliability, what defects might directly cause damage to other party's life, body or property (listed below).

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- | | | |
|---|------------------------------|-----------------------|
| 1) Aircraft equipment | 2) Aerospace equipment | 3) Undersea equipment |
| 4) Nuclear control equipment | 5) Medical equipment | |
| 6) Transportation equipment (automobiles, trains, ships, etc.) | 7) Traffic signal equipment | |
| 8) Disaster prevention / crime prevention equipment | 9) Data-processing equipment | |
| 10) Applications of similar complexity or with reliability requirements comparable to the applications listed in the above. | | |

- (2) Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by an abnormality or failure related to our product.

7. Caution for using

7.1 Installation and electrical connection of sensor

- (1) When installing sensor, tighten the nut at the torque levels less than 1.0N.m (10kgf.cm as reference). The exceeded force might damage the screw thread of sensor.
- (2) Please use the recommended connector which is " ZHR-3 series / J.S.T. made. When connectors other than this are used, poor contact and connector part destruction may occur.

7.2 Cleaning

Can not be cleaned by any solvents due to the open construction.

7.3 Operating environmental conditions

- (1) Uncontrolled mechanical force except usual rotation on the shaft of product, may cause big change of electrical characteristic, big increase of rotational torque or mechanical damage of product. Therefore, please pay your attention on the following points for your design. Please design your coupler by holding shaft bush to avoid exceeded radial or thrust shaft force of sensor.
- (2) Do not use the rotary position sensor under the conditions listed below. If you use the rotary position sensor in the conditions listed below, please consult with Murata factory representative prior to using.
1. Corrosive gasses atmosphere (Ex. Cl₂, H₂S, NH₃, SO₂, NO_x, etc.)
 2. In liquid (Ex. water, oil, medical liquid, organic solvent, etc.)
 3. Dusty / dirty atmosphere
 4. Direct sunlight
 5. Static voltage nor electric/magnetic fields
 6. Direct sea breeze
 7. Other variations of the above

7.4 Storage conditions

- (1) To ensure the solderability of the terminal, store that the temperature is -10°C~+40°C and the relative humidity is 30~85%RH, and use within six months after delivery. If you are going to use a product which has been stored for more than six months, please check its solderability beforehand.
- (2) Do not store in or near corrosive gases.
- (3) Do not store under direct sunlight.

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7.5 Circuit design and other

(1) Connecting impedance

The rotary position sensor is designed the condition shown on Fig-1, that is connecting the output terminal and A/D port of the microprocessor directly. In other words, connecting impedance presuppose certain M ohm and the contact resistance are set high. Therefore, please make sure the connecting impedance is not to be less than 10M ohm if you apply the circuit shown on fig-2.

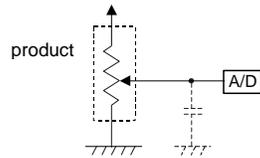


Fig-1

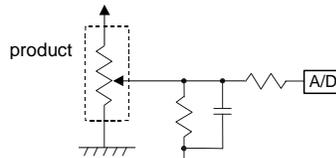


Fig-2

(2) Noise Suppression

To minimize the processing error which occur in rare cases, when data is installed through the product and noise influence from wiper contact and/or outside, please note the following points and program your software.

1. Data install should be done plural times and applied the mean value.
2. Data considered as error should be invalid.
3. Data should be re-installed if quaere occurs.

(3) Cautions to use grease or oil

In case of using grease or oil on connecting shaft or gear which are connected to the rotary position sensor, please prevent grease or oil coming into the rotary position sensor. If grease or oil puts into the rotary position sensor, the rotary position sensor may deviate from the specified characteristics.

8. Notice

- (1) Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
- (2) You are requested not to use our product deviating from the agreed specifications.
- (3) Please return one copy of this product specification with your signature of receipt. If the copy is not returned within three months, this product specification will be deemed to have been received.
- (4) We consider it not appropriate to include any terms and conditions with regard to the business transaction in the product specifications, drawings or other technical documents. Therefore, if your technical documents as above include such terms and conditions such as warranty clause, product liability clause, or intellectual property infringement liability clause, they will be deemed to be invalid.

9. Part number cross reference table

Bulk

Customer part No.	Murata part No.
	SV01C103BJZAEB00