

<Characteristics>

Temperature Cycle (Thermal Shock)	ΔTR : $\pm 20\%$ Linearity: $\pm 3\%$
Humidity	ΔTR : $\pm 20\%$ Linearity: $\pm 3\%$
Vibration	ΔTR : $\pm 10\%$ Linearity: $\pm 3\%$
Shock	ΔTR : $\pm 10\%$ Linearity: $\pm 3\%$
Humidity Load Life	ΔTR : $\pm 20\%$ Linearity: $\pm 3\%$
High Temperature Exposure	ΔTR : $\pm 5/-30\%$ Linearity: $\pm 3\%$
Low Temperature Exposure	ΔTR : $\pm 20\%$ Linearity: $\pm 3\%$
Rotational Life	ΔTR : $\pm 20\%$ Linearity: $\pm 3\%$

ΔTR : Total Resistance Change

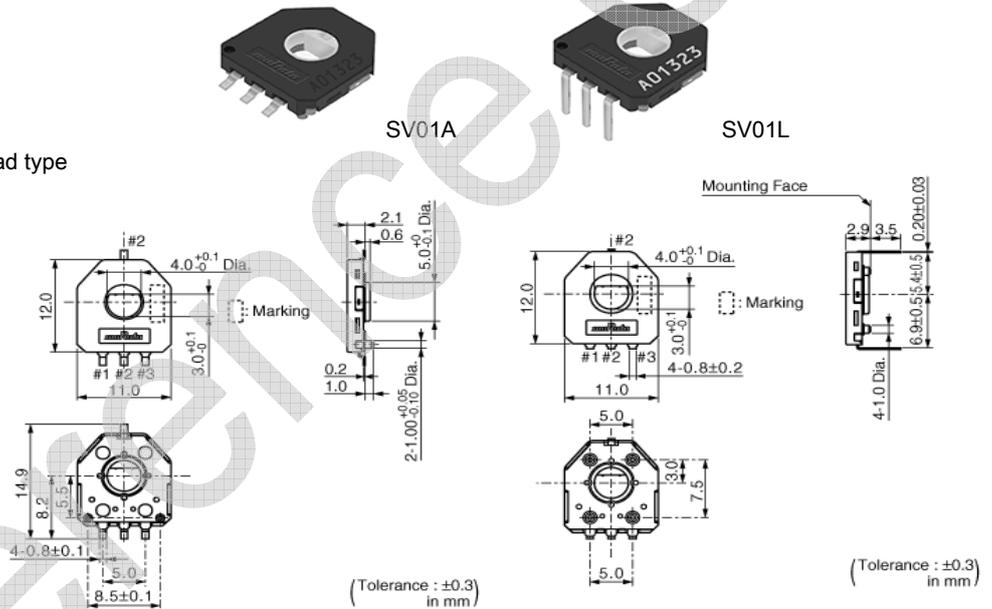
Rotary Position Sensor SV01 Series ; SMD/Lead Dust-proof Type 12mm Size

<Features>

1. High durability : 1M cycles
2. Pb free soldering : 260 deg.C
3. Au plated terminals
4. Terminal shape : SMD type and Lead type
5. Rotational rotor : Through hole type
6. Thin type : 2.1mm
7. RoHS compliant

<Application>

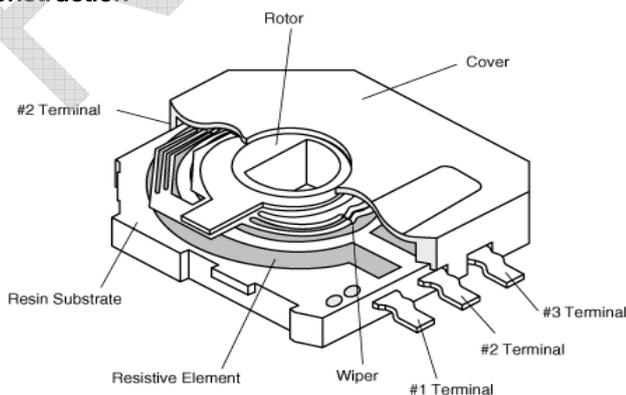
1. Switch for White goods
2. Digital Still Camera
3. Switch for automotive
4. Car audio
5. Multi function printer
6. Robot
7. Motor drive unit



<Specification>

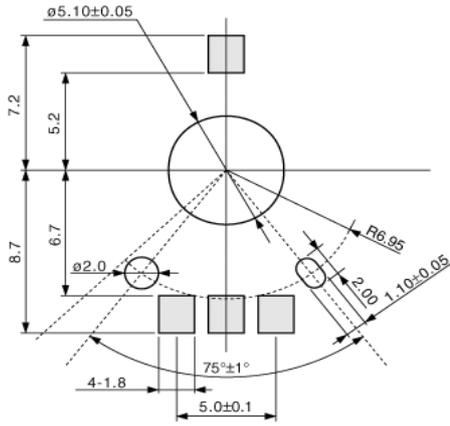
Part Number	Total Resistance Value (k ohm)	Linearity (%)	Effective Rotational Angle	Rotational Torque	Rotational Life
SV01A103AEA01	10 $\pm 30\%$	± 2	333.3° (Ref.)	2mN.m (Ref.:21gf.cm) max.	1M cycles
SV01L103AEA11	10 $\pm 30\%$	± 2	333.3° (Ref.)	2mN.m (Ref.:21gf.cm) max.	1M cycles

<Construction>



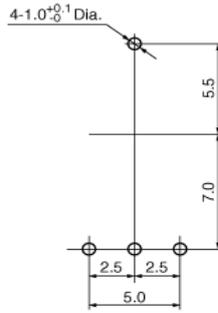
<Standard Land Pattern>

SV01A



(Tolerance: ±0.1 in mm)

SV01L



(in mm)
(Tolerance : ±0.1)

<Characteristics>

Temperature Cycle (Thermal Shock)	ΔTR : ±20% Linearity: ±3%
Humidity	ΔTR : ±20% Linearity: ±3%
Vibration	ΔTR : ±10% Linearity: ±3%
Shock	ΔTR : ±10% Linearity: ±3%
Humidity Load Life	ΔTR : ±20% Linearity: ±3%
High Temperature Exposure	ΔTR : +5/-30% Linearity: ±3%
Low Temperature Exposure	ΔTR : ±20% Linearity: ±3%
Rotational Life	ΔTR : ±20% Linearity: ±3%

ΔTR: Total Resistance Change

SV Series Notice

<Part Numbering>

Rotary Position Sensor

(Part Number)



① Product ID

Product ID	
SV	Rotary Position Sensor

② Series

Code	Series
01	Carbon Rotary Position Sensor
03	Carbon Rotary Position Sensor

③ Terminal Shape

Code	Terminal Shape
A	SMD Type
L	Lead Type

④ Total Resistance

Expressed by three figures. The unit is ohm. The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

Ex.)

Code	Total Resistance
103	10000Ω (=10kΩ)

⑤ Rotor Hole Shape/Rotor Hole Size

Code	Rotor Hole Shape/Rotor Hole Size
AE	D Hole/4.0mm Dia.

⑥ Individual Specification Code

Series	Code	Individual Specification Code
SV01	A01	SMD Type Standard
	A11	Lead Type Standard
SV03	A01	SMD Type, Lead Type Standard

⑦ Packaging

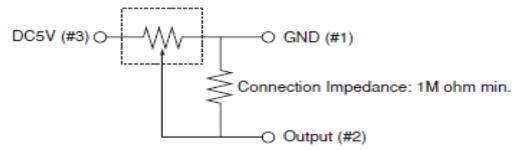
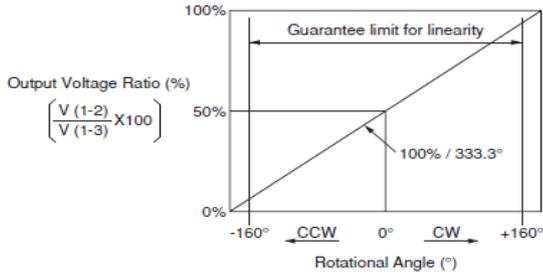
Code	Packaging
B00	Bulk
R00	Reel
T00	Tray

<Linearity>

Linearity should be specified a deviation with the below ideal straight line, between $\pm 160^\circ$ from the index point which is 50% of output voltage.

The ideal straight line has $100\%/333.3^\circ$ as taper and pass the above index point.

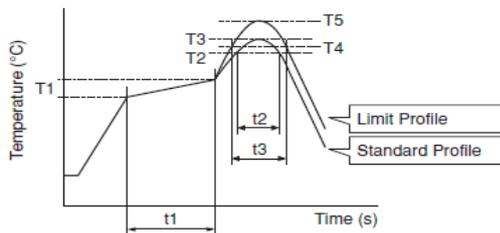
Measurement is performed using the following measurement circuit, and the rotor should be rotated to clockwise direction.



<Soldering>

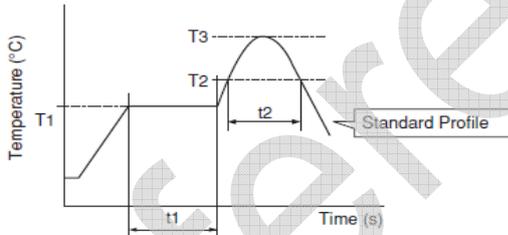
● Reflow Soldering Profile

1. Soldering profile for Lead-free solder (96.5Sn/3.0Ag/0.5Cu)



Series	Standard Profile						Limit Profile					
	Pre-heating		Heating		Peak Temperature (T3)	Cycle of Reflow	Pre-heating		Heating		Peak Temperature (T5)	Cycle of Reflow
	Temp. (T1)	Time (t1)	Temp. (T2)	Time (t2)			Temp. (T1)	Time (t1)	Temp. (T4)	Time (t3)		
°C	sec.	°C	sec.	°C	Time	°C	sec.	°C	sec.	°C	Time	
SV	150 to 180	60 to 120	220	30 to 60	245±3	2	150 to 180	60 to 120	230	30 to 50	260 +5/-0	2

2. Soldering profile for Eutectic solder (63Sn/37Pb)
(Limit profile: refer to 1)



Series	Standard Profile					
	Pre-heating		Heating		Peak Temperature (T3)	Cycle of Reflow
	Temp. (T1)	Time (t1)	Temp. (T2)	Time (t2)		
°C	sec.	°C	sec.	°C	Time	
SV	150	60 to 120	183	30	230	1

● Soldering Iron

Series	Standard Condition			
	Temperature of Soldering Iron Tip	Soldering Time	Soldering Iron Power Output	Cycle of Soldering Iron
°C	sec.	W	Time	
SV	350±10	3 max.	30 max.	1

<Handling>

Uncontrolled mechanical force (except usual rotation on the hollow rotor of product) may cause a change of electrical characteristics, an increase of rotational torque or mechanical damage of the product.

Therefore, please consider the following points for your design.

1. The product must be soldered by the terminals. Do not affix by screw clamping to support board as this could cause mechanical deformation.
2. The connecting shaft must be sustained by the bearing. No uncontrolled force should be applied to the hollow rotor.

<Other>

1. Please make sure the connecting impedance is not less than 1M ohm. The rotary position sensor is designed to connect the output terminal and A/D port of the microprocessor directly. Therefore, connecting impedance presupposes certain M ohm and the contact resistance is set high.
2. To minimize processing errors and rare cases of noise influence when data is installed, please consider the following when programming your software.
 - (1) Data install should be done plural times and applied the mean value.
 - (2) Data considered as error should be invalid.
 - (3) If suspicious data is found, the data should be re-installed.
3. Before using rotary position sensor, please test after assembly in your particular mass production system.
4. MURATA cannot guarantee rotary position sensor integrity when used under conditions other than those specified in this document.

<Packaging>

■ Minimum Quantity

Part Number	Minimum Quantity (pcs.)					
	ø180mm reel	ø330mm reel	Ammo Pack	Magazine	Bulk	Tray
SV01A103AEA01	—	1000	—	—	50	—
SV01L103AEA01	—	—	—	—	—	1000
SV03A103AEA01	—	1000	—	—	50	—
SV03L103AEA01	—	—	—	—	—	1000