## Features

- Thin 11mm angle/position sensor with 3-wire harness and connector offered as a standard assembly
- Reliable, durable magnetic circuit, Hall IC technology
- Long life of 30 million cycles
- Single output angle/position detection can be set within the F.S. measurement range
- Waterproof as standard with an IP64 rating
- Resistant to dither input, temperature variables, vibration impact and other external environmental factors
- Built-in magnet shield reduces interference from external magnetic field and isolates sensors from magnetic noise found in nearby motors
- 0.08W power rating
- Low impedance allows low load resistance
- Blind shaft-fitting design for front insertion of a blade shaft
- Popular screw mount flange with two oval mounting holes (hardware not included)
- RoHS compliant

## Applications

- Angle/position detection in electronically controlled devices found in automobiles, construction/agricultural machinery, snowmobiles, and marine vessels
- Various actuators such as valve opening/closing detection
- Angle/position settings for controlling electronic games and various entertainment systems
- Other applications for single output angle/position sensors requiring reliability and very long life

## Specifications

### Basic Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>5 ± 0.5V</td>
</tr>
<tr>
<td>Supply Current</td>
<td>16mV max.</td>
</tr>
<tr>
<td>Power Rating</td>
<td>0.08W</td>
</tr>
<tr>
<td>Mechanical Rotational Angle</td>
<td>130°</td>
</tr>
<tr>
<td>Electrical Rotational Angle</td>
<td>100.8° (0.4V to 4.6V)</td>
</tr>
<tr>
<td>Dustproof and Waterproof</td>
<td>IP64 rating</td>
</tr>
<tr>
<td>Output Characteristics</td>
<td>See Figure 1</td>
</tr>
<tr>
<td>Output Inclination</td>
<td>0.042V/degree</td>
</tr>
<tr>
<td>Measurement Circuit</td>
<td>See Figure 2</td>
</tr>
<tr>
<td>Output Resolution</td>
<td>5 /4096V (Vdd /12 bit)</td>
</tr>
<tr>
<td>Mounting Hole Pitch</td>
<td>36mm</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>−40°C to +125°C</td>
</tr>
</tbody>
</table>

### Significant Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Linearity</td>
<td>±1% before test; ±2% after test; (in percentage of F.S. measurement range); deviation of output voltage from referenced straight line (inclination of 0.042V/degree) connecting 0.4V to 4.6V (see Figure 1)</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±0.5° before test; ±0.5° after test; results based on difference of output voltage from hysteresis loop (origin curve and return curve)</td>
</tr>
<tr>
<td>Output Noise</td>
<td>±0.2% F.S. before test, ±0.2% F.S. after test</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>100MΩ min. before test; 10MΩ min. after test; 500VDC, MEGA between each lead and shaft fitting</td>
</tr>
<tr>
<td>Operating Torque - Minimum</td>
<td>0.0049N•m min. before test; 0.0010N•m min. after test (see Figure 3)</td>
</tr>
<tr>
<td>Operating Torque - Maximum</td>
<td>0.0588N•m max. before test; 0.0883N•m max. after test (see Figure 3)</td>
</tr>
</tbody>
</table>

Specifications Continued
### Endurance Performance

#### Operating Endurance

<table>
<thead>
<tr>
<th>Operating Temperature (°C)</th>
<th>Tested Rotational Cycles</th>
<th>Tested Operating Angle</th>
<th>Output Voltage Range (V)</th>
<th>Frequency Rate (Hz)</th>
<th>Applied Voltage To Vcc Connector Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>+25</td>
<td>30 million</td>
<td>100.8°</td>
<td>0.4 to 4.6</td>
<td>4</td>
<td>5V</td>
</tr>
<tr>
<td>+125</td>
<td>10 million</td>
<td>100.8°</td>
<td>0.4 to 4.6</td>
<td>4</td>
<td>5V</td>
</tr>
<tr>
<td>−40</td>
<td>10 million</td>
<td>100.8°</td>
<td>0.4 to 4.6</td>
<td>4</td>
<td>5V</td>
</tr>
<tr>
<td>+125</td>
<td>100 million</td>
<td>5°</td>
<td>2.4 to 2.6</td>
<td>30</td>
<td>5V</td>
</tr>
</tbody>
</table>

Sweep Vibration

2.5V reference point at +25°C, 30G, 50-250Hz, X, Y, Z direction, 12 hours

Shock

100G, 3 minutes, 18 times

Humidity

80 ± 3°C, 95 ± 5%RH, 1,000 hours

Temperature Cycle

−40°C for 1 hour ± +125°C for 1 hour, 1,000 cycles

Low Temperature Shelf Life

−40°C, 1,000 hours

High Temperature Shelf Life

+125°C, 1,000 hours

Moisture, Rain, and Spray

JIS-D-0203-D1, temperature of water shall be 10°C lower than temperature of test sample, D1 dip test time: 5 minutes, 10 cycles (installation side of part is sealed using an assembly tool)

Electromagnetic Susceptibility

200 V/m, 1MHz to 1GHz

Electrostatic Discharge

±8kV contact discharge; ±15kV air discharge; IEC-61000-4-2

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### Output Analysis

**Figure 1: Output Characteristics**

![Output Characteristics Diagram](image)

Unit: mm

- Initial Position of Rotor
- Electrical Angle (100.8°)
- Mechanical Angle (130°)
- Output Inclination: 0.042V/deg.
**Figure 2: Measurement Circuit**

```
<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>5VDC</td>
<td>Blue</td>
</tr>
<tr>
<td>SENSOR</td>
<td></td>
</tr>
<tr>
<td>10kΩ</td>
<td></td>
</tr>
<tr>
<td>10kΩ</td>
<td></td>
</tr>
<tr>
<td>0.1µF</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>Yellow</td>
</tr>
<tr>
<td>GND</td>
<td>Black</td>
</tr>
</tbody>
</table>
```

**Dimensional Drawings of Front View A with Wire Harness and Connector**

Unit: mm

- Direction of Output Increase (CW)
  - Ø26 ±0.2
  - Ø14 ±0.2
  - 25°

- SPCC/Trivalent Chromate
- Pull-out Load: 19.6N min.

- Output (Yellow)
- GND (Black)
- Vdd (Blue)

- Dimensions
  - Sumitomo Wiring Connector 6187-3232
  - PVC Tube Heat-Proof 105°C (Black)
  - AEX0.5f Wires
  - Ø1 4/11555
  - Ø26/11536
  - 0.2/11537
  - (36) 250/11555
  - 100°
  - 10°
  - 0°
RSM011 Series

Dimensions

Dimensional Drawings of Back, Side, and Bottom Views

Unit: mm

Rotational Torque

Figure 3: Operating Torque
RSM011 Shaft Fitting

Blind Shaft Fitting
Detail from Front View A

Unit: mm

Recommended Blade Shaped Shaft

Secure clearance.
No thrust direction contact
between shaft and rotor.

Shaft

Secured clearance.
No thrust direction contact
between shaft and rotor.

Rotor

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