

Low Profile, Single Output, Non-Contact Angle/Position Sensors



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 a guaranteed range of 17° up to 96°
- 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

Supply Voltage	5 ± 0.5V	Mechanical Rotational Angle	130°
Supply Current	16mV max.	Electrical Rotational Angle	100.8° (0.4V to 4.6V)
Power Rating	0.08W	Output Guaranteed Range	96° (0.5V to 4.5V)
Output Characteristics	See Figure 1	Output Inclination	0.042V/degree
Measurement Circuit	See Figure 2	Output Resolution	5/4096V (Vdd/12 bit)
Operating Temperature Range	-40°C to +125°C	Mounting Hole Pitch	36mm

Significant Characteristics

Output Linearity	±1% before test; ±2% after test ; (in percentage of output guaranteed range); deviation of output voltage from referenced straight line (inclination of 0.042V/degree connecting 0.5V to 4.5V (see Figure 1))		
Hysteresis	±20mV before test; ±50mV after test ; results based on difference of output voltage from hysteresis loop (origin curve and return curve) between reference point (0.5V) and 96°		
Output Noise	±10mV before test, ±10mV after test		
Insulation Resistance	100MΩ min. before test; 10MΩ min. after test ; 500VDC, MEGA between each lead and shaft fitting		
Operating Torque - Minimum	0.0049N•m min. before test; 0.0010N•m min. after test (see Figure 3)		
Operating Torque - Maximum	0.0588N•m max. before test; 0.0883N•m max. after test (see Figure 3)		

Specifications Continued

Endurance Performance

Operating Endurance

Operating Temperature (°C)	Tested Rotational Cycles	Tested Operating Angle	Output Voltage Range (V)	Frequency Rate (Hz)	Applied Voltage To Vcc Connector Pin
+25	30 million	96° (17° \rightleftharpoons 113°)	0.5 to 4.5	4	5V
+125	10 million	96° (17° \rightleftharpoons 113°)	0.5 to 4.5	4	5V
-40	10 million	96° (17° \rightleftharpoons 113°)	0.5 to 4.5	4	5V
+125	100 million	6° (62° \rightleftharpoons 68°)	2.4 to 2.6	30	5V

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

Shock 100G, 3 minutes, 18 times

Humidity 80 \pm 3°C, 95 \pm 5% RH, 1,000 hours

Temperature Cycle -40°C for 1 hour \rightleftharpoons +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-D0203-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)

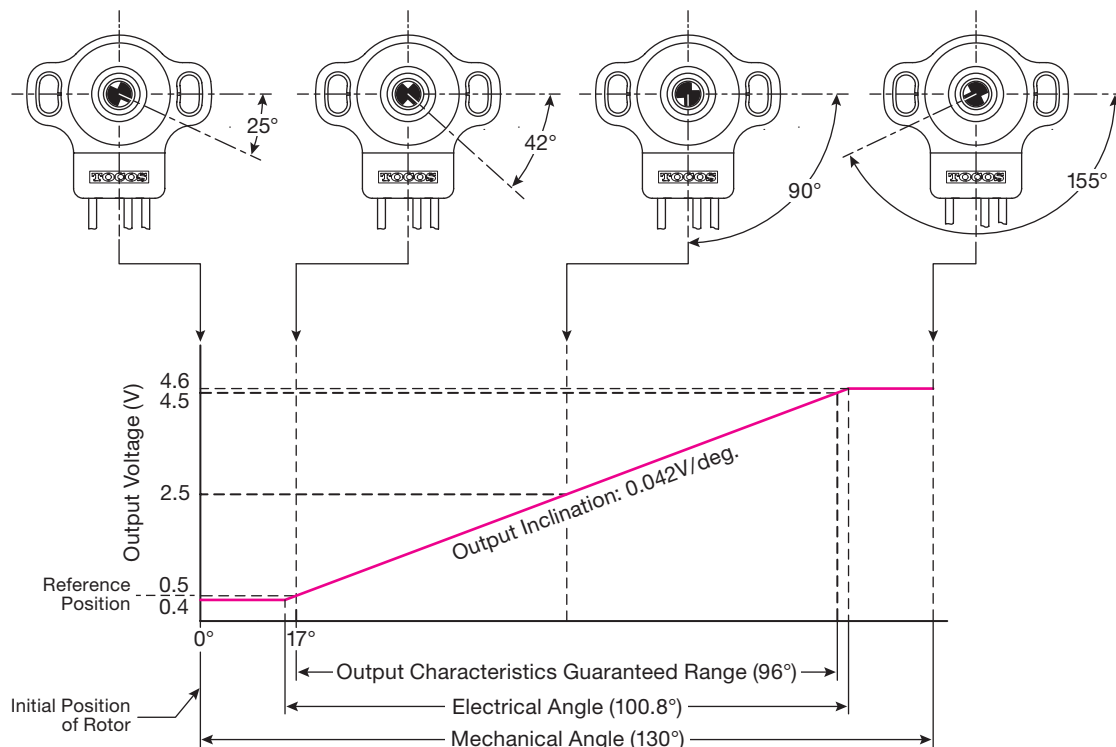
Electromagnetic Susceptibility 200 V/m, 1MHz to 1GHz

Electrostatic Discharge \pm 8kV contact discharge; \pm 15kV air discharge; IEC-61000-4-2

Output Analysis

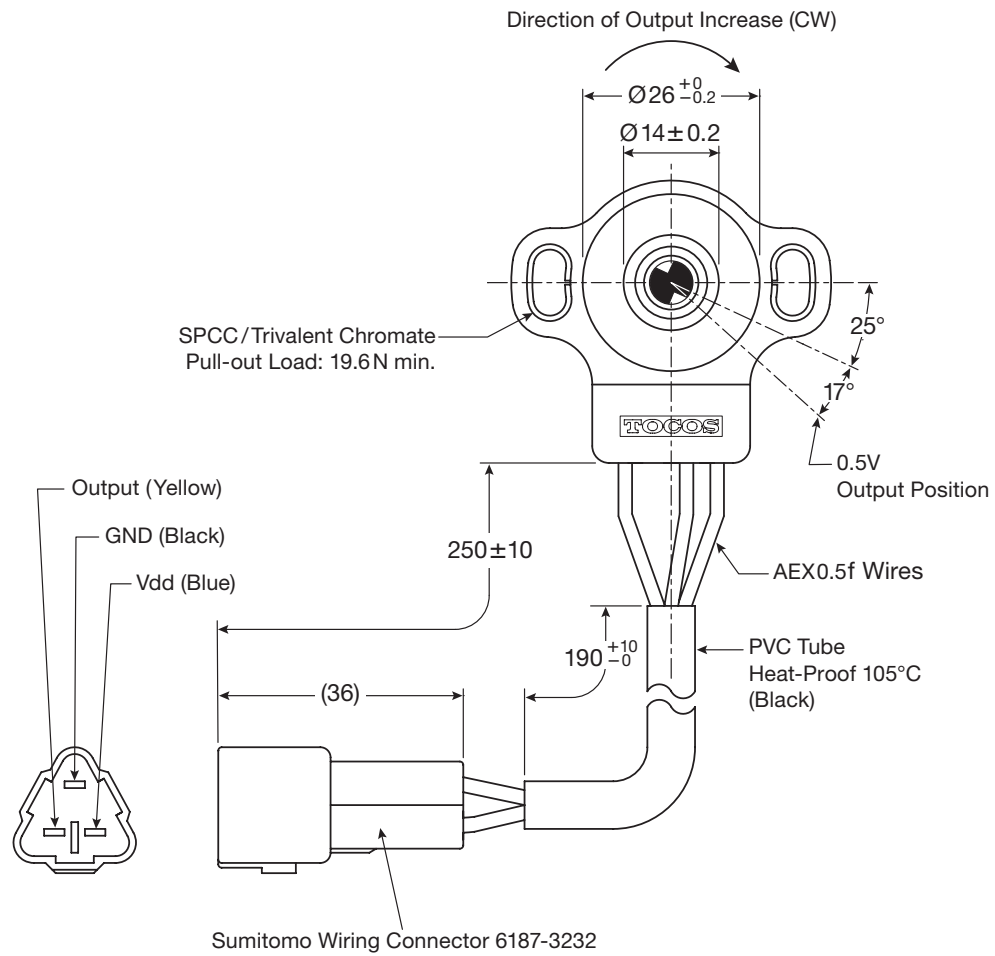
Figure 1: Output Characteristics

Unit: mm



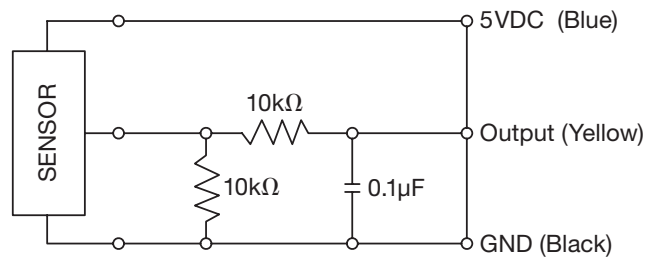
Dimensional Drawings of Front View A with Wire Harness and Connector

Unit: mm



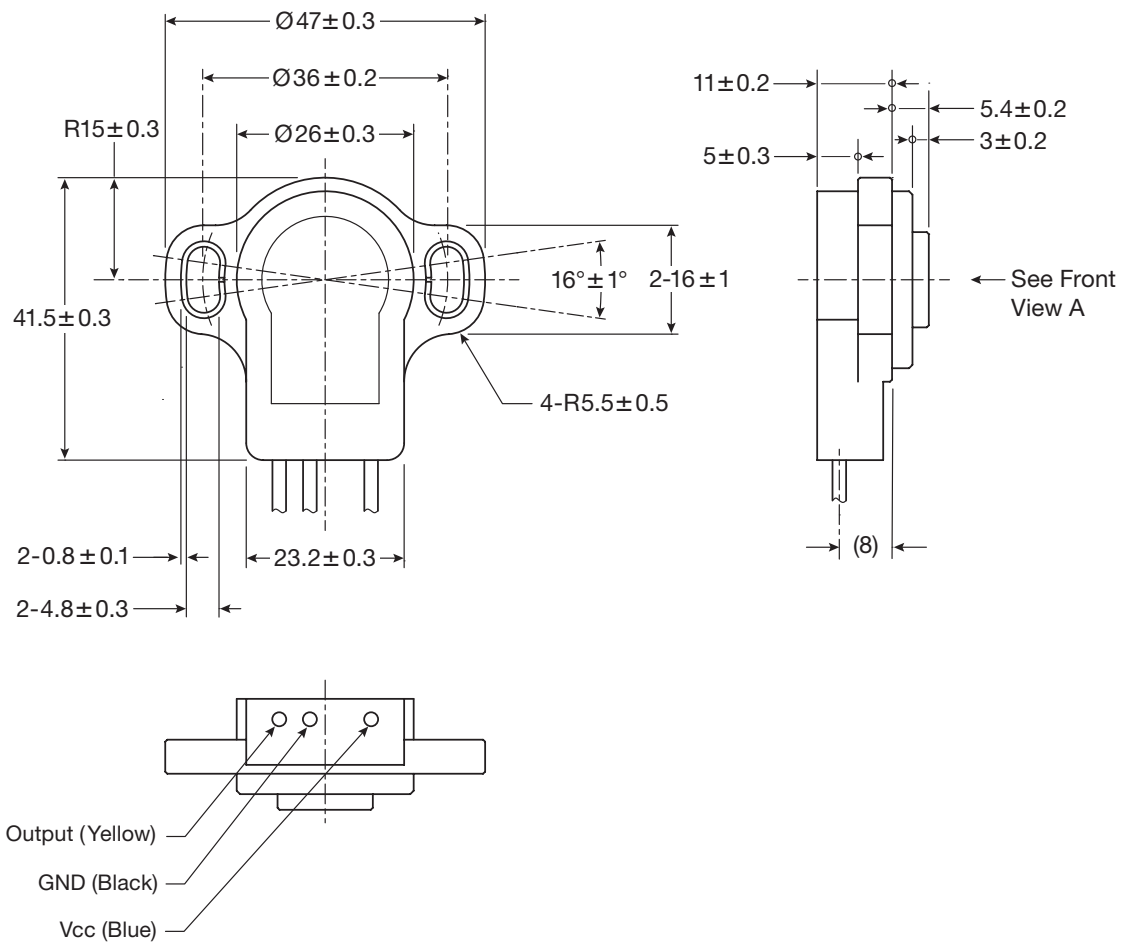
Electrical Schematic

Figure 2: Measurement Circuit



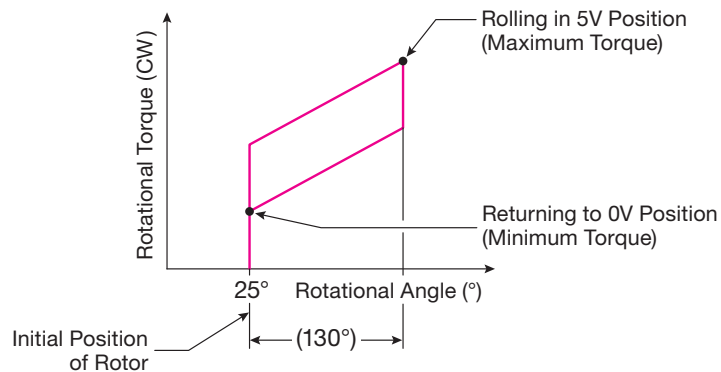
Dimensional Drawings of Back, Side, and Bottom Views

Unit: mm



Rotational Torque

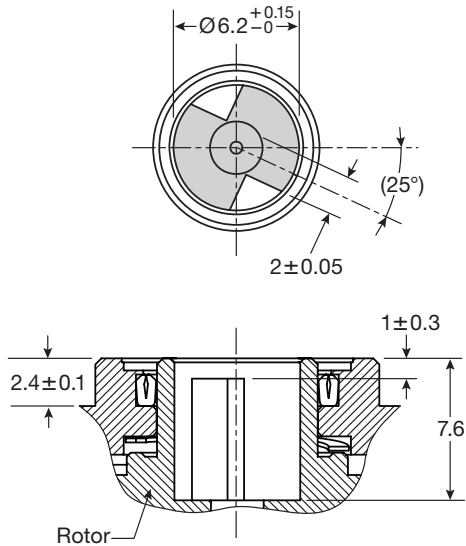
Figure 3: Operating Torque



RSM011 Shaft Fitting

Blind Shaft Fitting Detail from Front View A

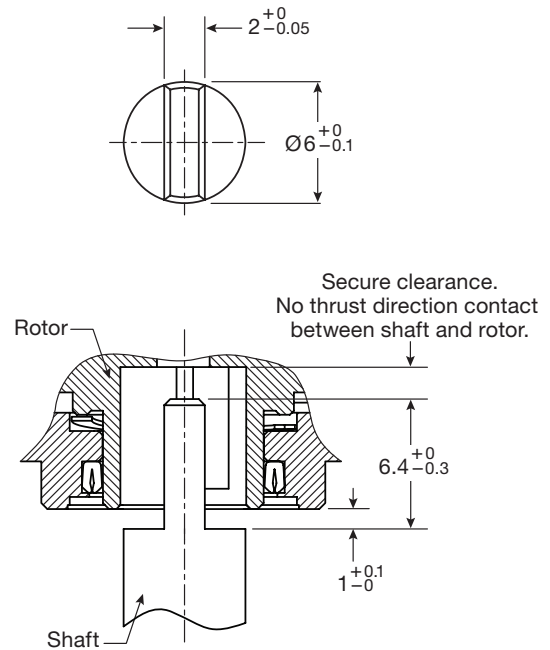
Unit: mm



RSM011 Shaft Style

Recommended Blade Shaped Shaft

Unit: mm



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