

Single Output, Non-Contact Angle/Position Sensors



Features

- All-in-one housing with angle/position sensor, threaded flat shaft, and integral female connector
- Reliable, durable magnetic circuit, Hall IC technology
- Long life of 15 million cycles
- Single output angle/position detection customizable within 20° to 140°
- Flat threaded shaft actuated in the CCW direction for angle/position detection and automatic return operation
- Compatible with industry-standard mating connectors
- Built-in magnet shield reduces interference from external magnetic field and isolates sensors from magnetic noise found in nearby motors
- 0.07W power rating
- Waterproof as standard with an IP65 rating
- Operating temperature range of – 30°C to +120°C
- Screw mounting flange with two round (Ø4.6mm) mounting holes (hardware not included)
- RoHS compliant

Applications

- Angle/position detection in electronically controlled devices found in automobiles or construction/agricultural machinery
- Manufacturing control systems, i.e. robotics, conveyors, and tooling
- Sensor settings for steering and speed control for off-road vehicles such as golf carts, ATVs, and snowmobiles
- Wide variety of applications for non-contact, single output angle/position sensors requiring reliability and long life

Specifications

Basic Characteristics

Electrical Angle	50° (Customizable within 20° to 140°)	Operating Temperature Range	– 30°C to +120°C
Mechanical Angle	150 ± 5°	Storage Temperature Range	– 40°C to +130°C
Rated Voltage	5 ± 0.5VDC	Circuit Structure	See Figure 1
Maximum Rated Voltage	12VDC	Measurement Circuit	See Figure 2
Power Rating	0.07W	Output Characteristics	See Figure 5
Mounting Hole Pitch	41mm	Environmental Load Substances	RoHS compliant

Significant Characteristics

Output Linearity	± 3% (±150mV) before test; ± 5% (± 250mV) after test ; in percentage based on deviation of output voltage from referenced straight line (reference position: 2.5V when applying 5VDC); and within output characteristics guaranteed range of 0.7V to 4.3V (see Figure 5)		
Hysteresis	± 1% (±80mV) before test; ± 1.5% (±120mV) after test ; output characteristics guaranteed range: 0.7V to 4.3V		
Insulation Resistance	100MΩ min. before test; 100MΩ min. after test ; 500VDC, MEGA between each lead and shaft		
Operating Torque - Minimum	0.020N•m min. before test; 25% max. change of initial value after test (see (a) in Figure 4)		
Operating Torque - Maximum	0.094N•m max. before test; 25% max. change of initial value after test (see (b) in Figure 4)		

Specifications Continued

Endurance Performance

Operating Endurance

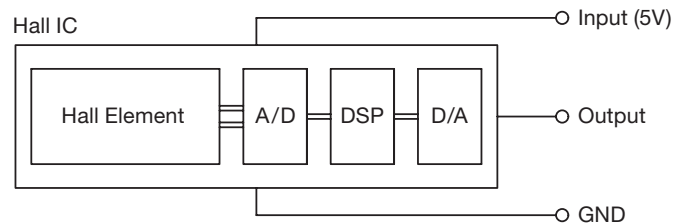
Rotational Life	15 million cycles (guaranteed output voltage range of 0.7V to 4.3V)
Low Temperature Exposure	-40°C, 72 hours
High Temperature Exposure	+130°C, 72 hours
Temperature Cycle	-25°C for 1 hour \rightleftharpoons +70°C for 1 hour, 10 cycles
Vibration	JIS D1601 3-B-70
Electromagnetic Susceptibility	200 V/m, 1MHz to 1GHz
Electrostatic Discharge	\pm 8kV contact discharge; \pm 15kV air discharge; IEC-61000-4-2
International Protection	IP65 rating

Precautions

1. Product Handling: If installing a lever to the product, do not apply an operating torque that exceeds 0.49N·m (5kgf·cm) to the internal stopper.
2. About Washing: Do not wash the product as this will adversely affect the components, especially plastics.
3. About Storage: Do not store the product under hot, humid conditions or expose the product to corrosive gases.
4. About Automatic Return Operation: To avoid damaging the internal stopper, do not allow the shaft to travel from fully open position to fully closed position in one motion.
5. About Operating Environment: Do not use materials that generate harmful gases (sulfide gas, chlorine gas, etc.) for components that will be assembled in the product.

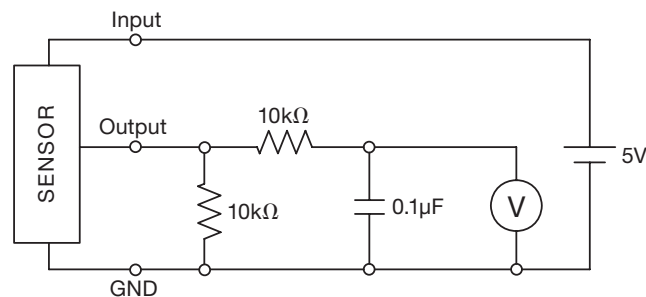
Circuit Structure

Figure 1: Hall IC Magnetic Circuit



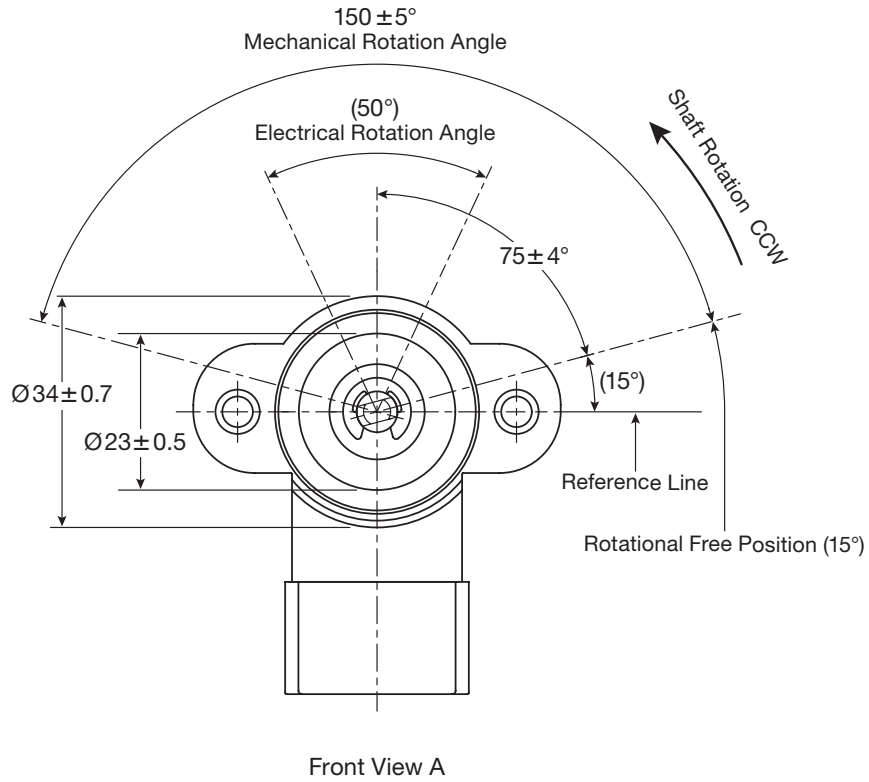
Electrical Schematic

Figure 2: Measurement Circuit



Dimensional Drawing of Front View A

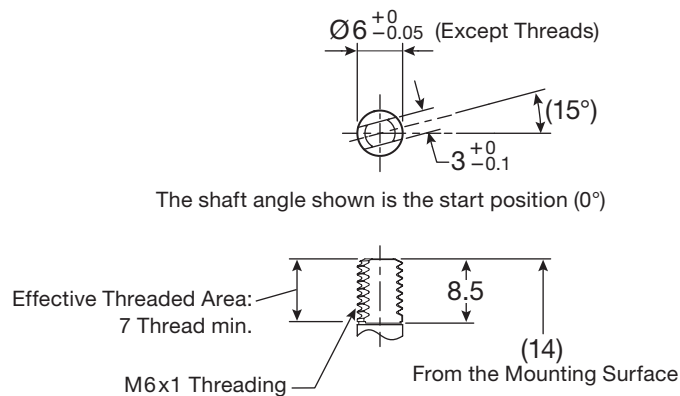
Unit: mm



Shaft Specifications

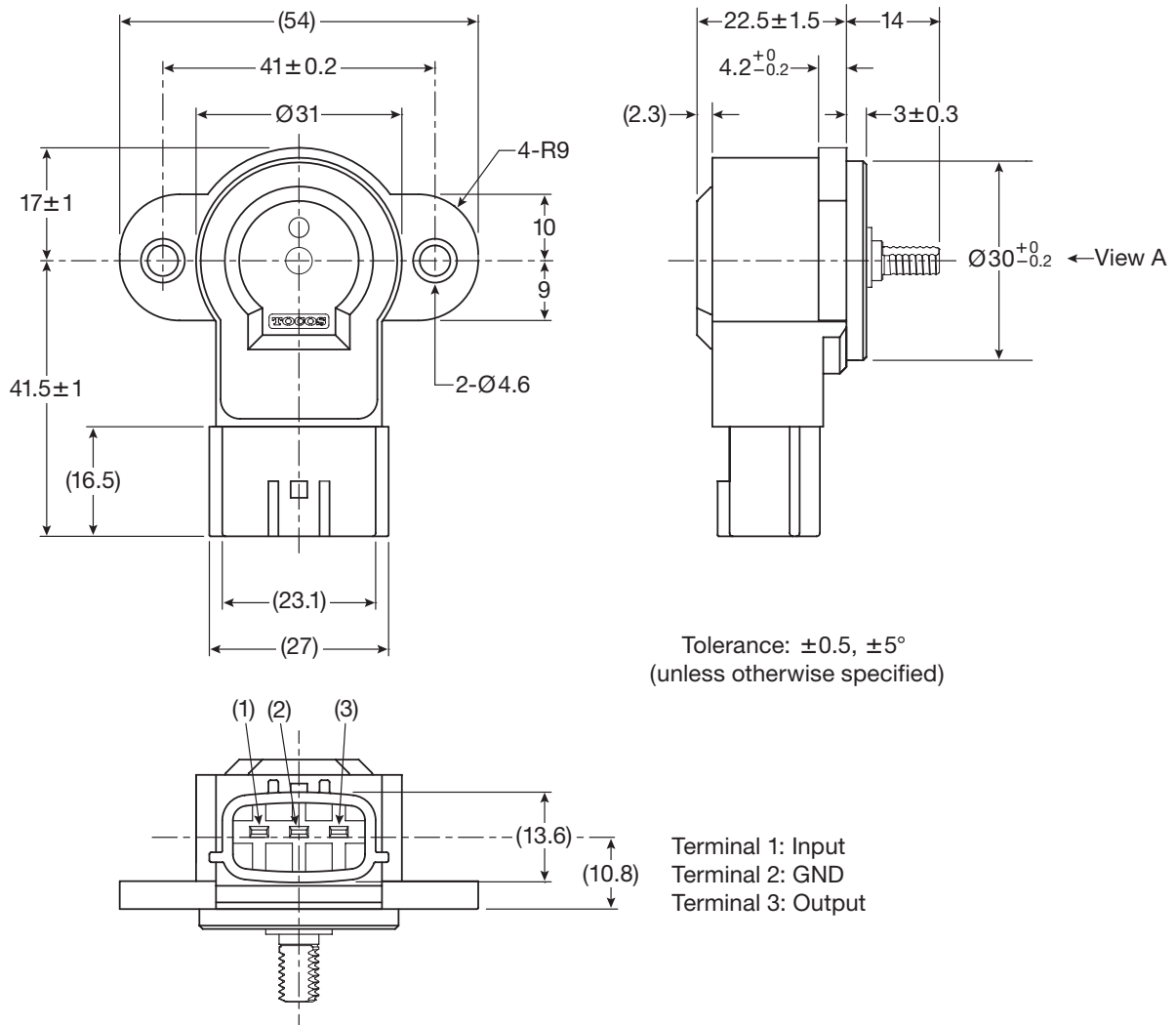
Figure 3: Shaft Shape and Threading

Unit: mm



Dimensional Drawings of Back, Side, and Bottom Views

Unit: mm



Rotational Torque

Figure 4: Operating Torque

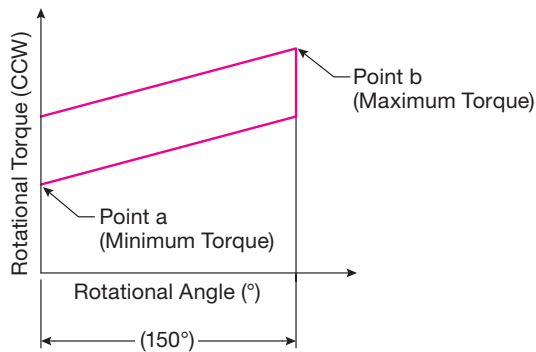
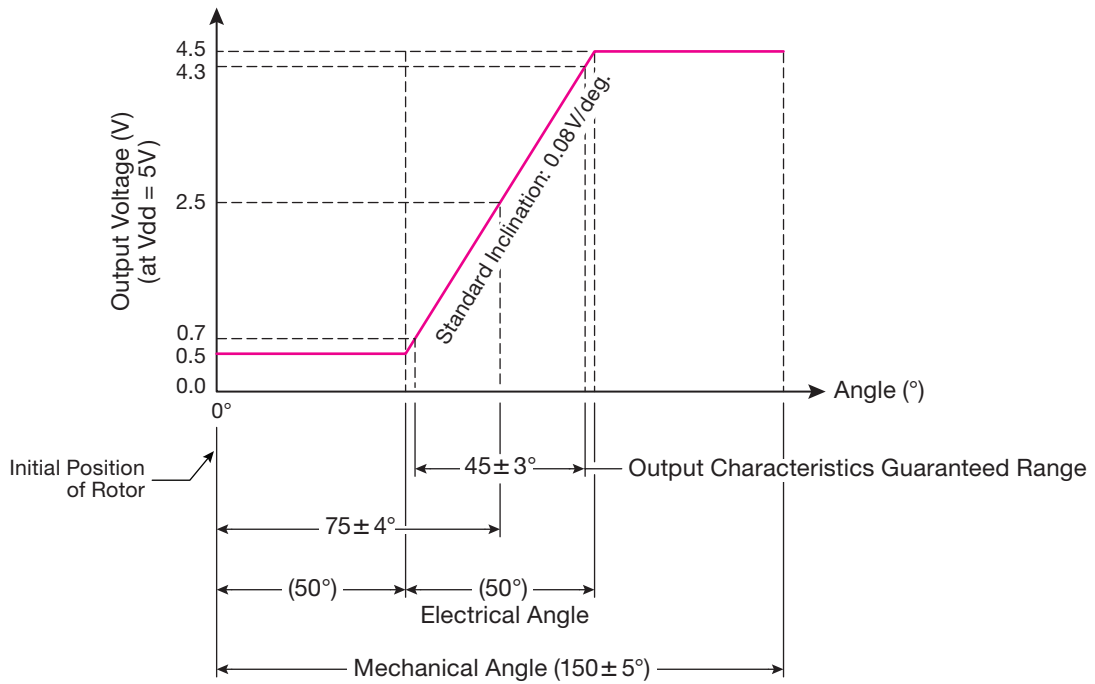


Figure 5: Output Characteristics (Applied Voltage: 5.0V Constant)

When the applied voltage changes within the rated voltage range,
the output voltage changes at the same rate.

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