

Non-Contact Inductive Position Sensor

One technology for various position motions



Non-Contact Inductive Position Sensor

Description

Inductive position sensor for absolute rotary or linear motion sensing in automotive, off-highway, industrial, medical and consumer applications.

It uses the physical principles of induction in a wire loop and eddy currents to detect the position of a solid metallic structure that is sliding or rotating above a set of coils consisting of one transmitter coil and two receiver coils.



The coils are printed as copper traces on a printed circuit board (PCB) and arranged such that the transmitter coil induces a secondary voltage in the receiver coils that depends on the position of the metallic target above the coils.

The absolute angle measurement provides instant feedback of the metallic target's angular position with a resolution of up to 12 bit.

Custom product design packaging can be provided to meet any form, fit and function including the choice of wire harness and interface connector.

Examples of applications

- e-motor Rotor Position Sensor.
- Brake / Clutch / Throttle pedal sensor.
- Hand throttle position.
- Boom arm position.
- Suspension height sensor.
- Steering wheel position or Steer-by-wire.
- Seat position.
- Chassis level position.
- Transmission sensor.
- Joystick control.
- Fin controls.
- Hitch position.
- Bucket position.
- Fork position and hight.
- Mast tilt.
- Telehandler arm position.
- Power trim and tilt angle.
- Crankshaft and camshaft position.
- Motor-shaft resolver replacement.

Main features

- Rotary and linear stroke.
- 360° electrical rotational angle.
- AEC-Q100, Grade 0 automotive qualified IC.
- High accuracy. Full resolution for every angle range.
- Wide operation temperature: -40°C to +160°C.
- Supply voltage 4.5 to 5.5V +/-10%.
- Overvoltage and reverse-polarity protection: -14 V to +18 V max.
- Analogue, PWM or SENT output (10 and 12 bits resolution full scale).
- Power or ground loss detection.
- Long linear stroke up to 800mm.
- Stray field immunity, no shielding required.
- ESD and short-circuit protection.

Benefits

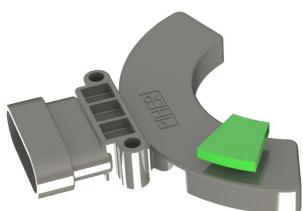
- Cost effective as no magnet is needed. Metallic target can be milled into the end of a metallic shaft or be part of the customer's application.
- Easy assembly.
- Low profile.
- Low power consumption (max. 20mA).
- Non-contact solution: wear free.
- Robust against dust and vibration.
- On-shaft, off-shaft and arc sensor design available.
- Applicable for low and high speed applications not lossing output resolution bits.
- Maintains original accuracy for small rotary angles.
- Tolerant to mechanical misalignment in any direction.
- Programmable output slope.
- Suitable for implementation in safety-related systems compliant to ISO26262.



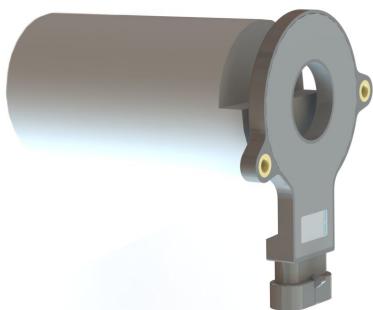
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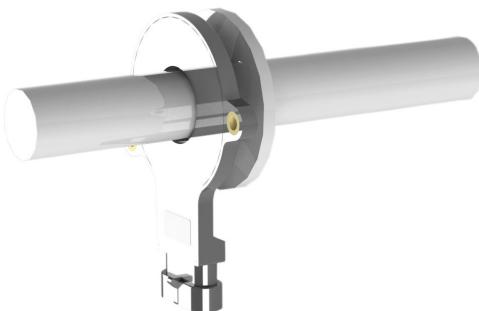
Arc off-axis. Narrow angles



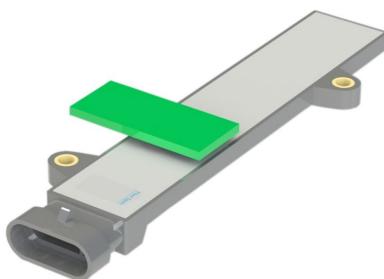
End of shaft on-axis



Through shaft on-axis rotation



Linear motion



Through-shaft high speed version

- Speed up to 250.000 (electrical) RPM (differential sine and cosine output).
- High precision + absolute positioning: redundant design/multipole + single sector.
- SIL (industrial) and ASIL (Automotive) support through safety features.
- Scalable around motor and motor-shaft dimensions.
- Stable over temperature working range.
- Tolerant against radial and axial misalignment.
- Stray field immune.
- Cost effective.



Non-Contact Inductive Position Sensor

Piher's portfolio of sensor technologies

| | Resistive | Magnetoresistive | Hall effect | Inductive |
|-------------------------------|----------------|------------------|------------------|------------------|
| Life | Good | Excellent | Excellent | Excellent |
| Cost | Low | Medium | Medium | Medium |
| Accuracy | Normal | Good | Good | Excellent |
| Operating temperature | -40°C to +90°C | -40°C to +150°C | -40°C to +150°C | -40°C to +160°C |
| Output | Analog | Analog | Analog & digital | Analog & digital |
| External stray field immunity | Yes | Shielding needed | Shielding needed | Yes |
| Target element | Metallic wiper | Magnet | Magnet | Metallic part |

Piher Sensing Systems - Amphenol Sensors BENEFITS:

- ✓ Value added proposition:
 - o Engineering design-in support
 - o Cable harness and connector assembly
 - o Output customization
 - o Manufacturing capabilities for high and low volume programs
- ✓ One-stop solution provider for different position sensing technologies (hall-effect, inductive, capacitive and contacting)
- ✓ One-stop sensor provider not limited to Position sensors (Temperature, Gas & Moisture, Pressure etc) with diverse product portfolio of standard and customized products.
- ✓ Piher Sensing Systems has a global footprint through Amphenol Sensors providing local customer support

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RoHS
compliant



All Piher products can be adapted to meet customer's requirements.

Due to continuous process improvement, specifications are subject to change without notice.

Please always use the datasheets published at our website www.piher.net for the most up-to-date information.

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