Enabling the Electronics Revolution

PIHER sensing systems
an Amphenol® company

PSTI

Inductive Through-Shaft eMotor Rotor Position Sensor

Accurate feedback on the angular position, direction, and speed of the rotor shaft is essential for optimizing control of the motor inverter and drive the electric engine with maximum efficiency. The PSTI high-speed inductive rotor position sensor's metallic target can be mounted on the same shaft as the electric machine rotor, is immune to electromagnetic stray fields, and provides accurate measurement of rotor position in a compact, lightweight, and fully sealed package.

KEY FEATURES

- Up to 600.000 (el) rpm speed
- Low weight and compact dimensions
- Robust to tilt, misalignment and air gap variations
- True power-on sensor: excellent accuracy and precision
- Immune to stray fields, no shielding required
- End-of-shaft sensor for metallic target
- Standard version available for 6, 8, 10 and 12 poles
- Suitable for harsh environments (fully sealed, shock, vibration)
- Cost-effective alternative to conventional resolvers and encoders

MAIN APPLICATIONS

- e-motorbike rotor position sensor
- e-boat rotor position sensor
- Factory Automation
- Industry 4.0
- Traction motors

ELECTRICAL SPECIFICATIONS

Supply voltage	5V ±10%
Supply current	Max 15mA
Voltage protection	±18 V
Accuracy	±1°el
Signal output*	Single-ended demodulated sine/cosine (1.0V to 4.0V) Differential demodulated sine/cosine (-3V to +3V)
Resolution	Infinite
Propagation delay	‹4.2 µsec
Maximum electrical speed	600.000 rpm

* Other output types (upon request): SENT, Analog (ratiometric) and PWM. Check availability and specifications before ordering.

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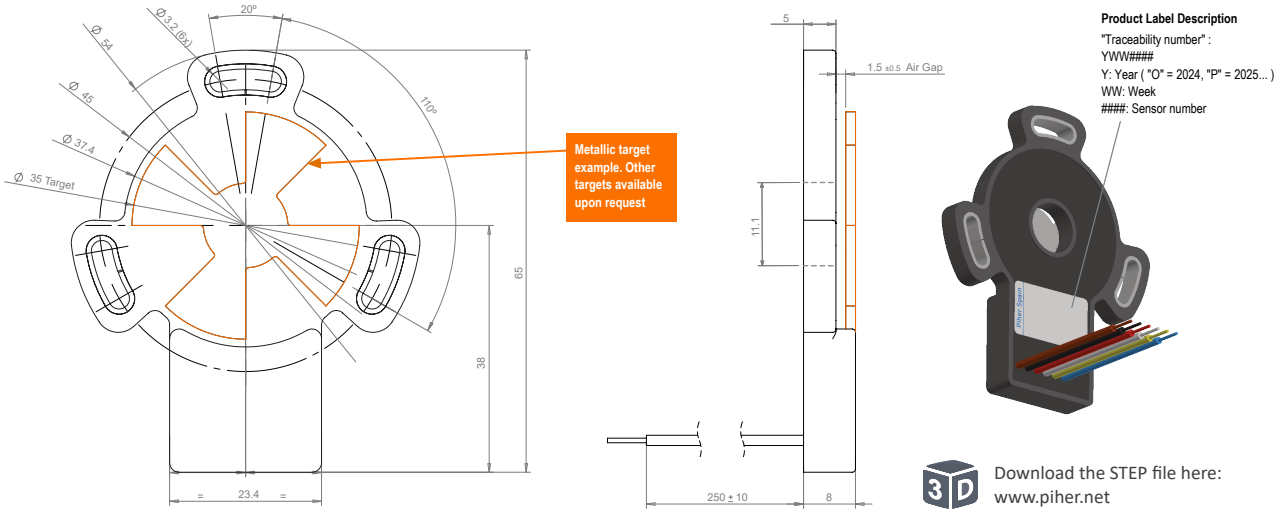
MECHANICAL SPECIFICATIONS

Rotational life	Unlimited
Max. mounting torque	2.2 Nm
Maximum mechanical speed	200.000 rpm (3-pole pair version) 150.000 rpm (4-pole pair version) 120.000 rpm (5-pole pair version) 100.000 rpm (6-pole pair version)
Target material*	Conductive metal
Operating temperature (with wires)**	-40° to +125°C
Sealing	IP67, IP69K

* Target not included, if you need target design support please contact us. ** Higher temperatures can be studied

DIMENSIONS (MM)



CONNECTION SCHEME

Color	Single-Ended	Differential
Blue	Ground	Ground
Yellow	Sine (+)	Sine (+)
White	n/a	Sine (-)
Red	Cosine (+)	Cosine (+)
Black	n/a	Cosine (-)
Brown	Vcc	Vcc

More instructions of use on www.piher.net. Connector assembly available on request.

HOW TO ORDER

Part number	
PSTI-3PP-05	3-pole pair (6 poles) differential output
PSTI-4PP-05	4-pole pair (8 poles) differential output
PSTI-5PP-05	5-pole pair (10 poles) differential output
PSTI-6PP-05	6-pole pair (12 poles) differential output

Single-ended output sensors available on request.

End-of-shaft version available ›› here ‹‹

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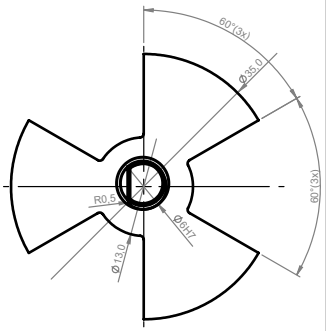
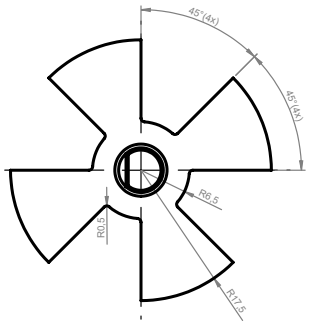
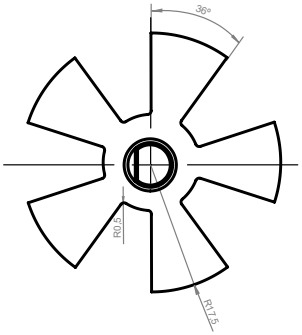
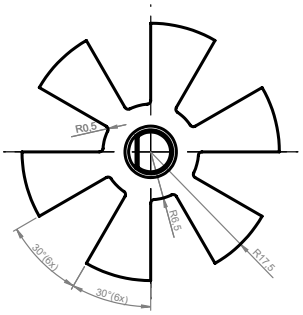
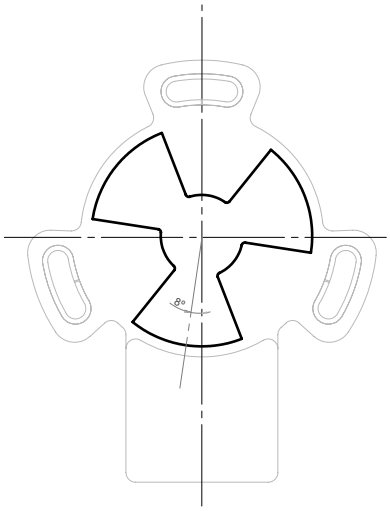
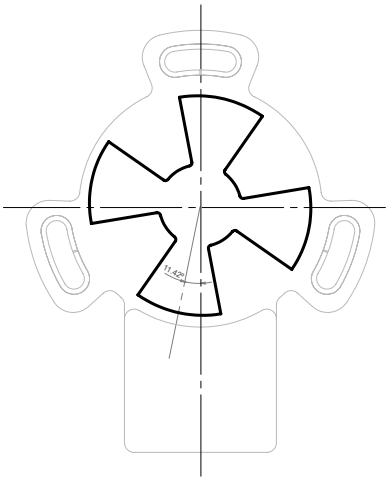
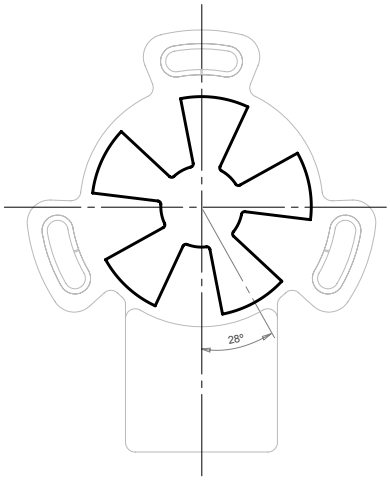
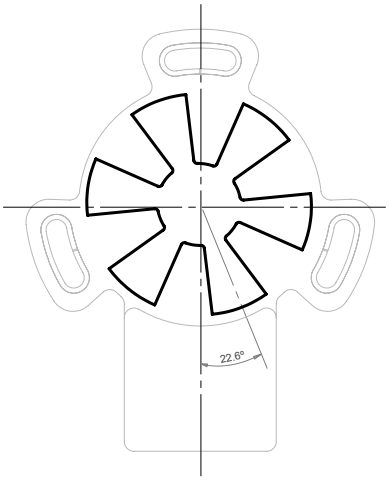
TARGET DESIGN

3 Pole Pairs	4 Pole Pairs	5 Pole Pairs	6 Pole Pairs
			

Target not included, for support please contact Piher Sensing Systems. Drawings may be not to scale.

ZERO POSITION

3 Pole Pairs	4 Pole Pairs
	

5 Pole Pairs	6 Pole Pairs
	

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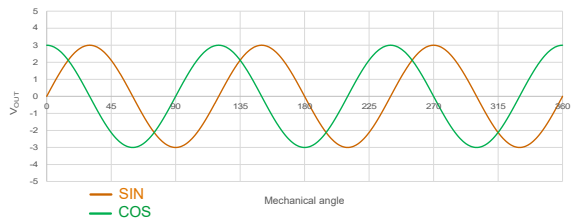
WORKING PRINCIPLE

This sensor utilizes the physical principle of Eddy currents to accurately detect the position of a simple metallic target moving above a set of coils, which includes one transmitter and two receivers. By leveraging this mechanism, the sensor can deliver precise absolute rotor position information in the form of sine and cosine signals. The output interface is highly versatile and can be configured either as single-ended, offering a cost-effective solution for the system, or as differential, providing superior rejection of common mode disturbances for enhanced reliability and accuracy.

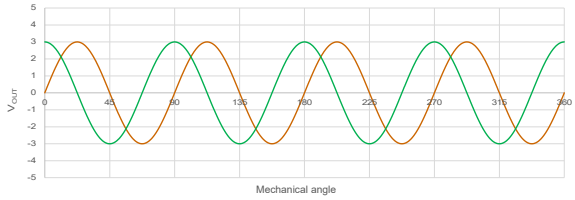
Additionally, the sensor features robust signal processing capabilities to ensure high-resolution measurements, making it ideal for applications in various industries such as automotive, aerospace, and industrial automation. With its compact design and high durability, the PSTI inductive sensor offers a reliable and efficient solution for position sensing needs, even in harsh environments.

SIN/COS OUTPUT SIGNALS

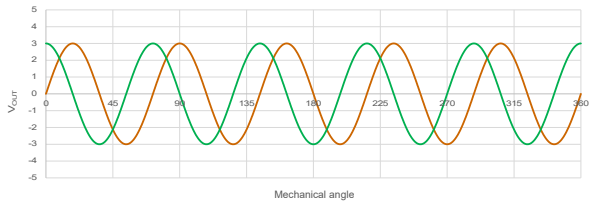
3 Pole Pairs



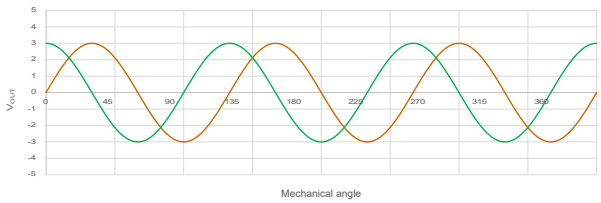
4 Pole Pairs



5 Pole Pairs



6 Pole Pairs



Please always use the latest updated datasheets published on our website.

CONTACT

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