

Magnetic rotary hollow-shaft position sensor/control

Contactless sensor PST-360

Available with
CAN SAE J1939



The PST-360 through hole / hollow-shaft position sensors combine three critical design features; 1) through hole where the shaft passes through the sensor, 2) high accuracy absolute position feedback over up to 360 degrees, and 3) a true non-contacting sensing element. Piher's design does not rely on gears or other rotating parts.

This innovative and unique patented design features the following advantages:

- Compliments the attributes of the target application.
- Mechanical integrity that matches customer's application by design.
- Unique shaft mounted design that mounts at the pivot point of the application.
- No levers, connecting rods or mechanical interfaces needed.
- Adapts to shaft's eccentricity, mounting tolerances and mechanical wear over the life of the application.

Mechanical specifications

Rotational life (depends on application and mounting)	up to 50.000.000 cycles.
Operating temperature ¹	-40°C to +125°C.

Electrical specifications

Linearity ¹	±1% absolute (0.5% upon request).
Angular range	Programmable from 15 to 360 degrees.
Output ²	Analog (Ratiometric), PWM. Serial protocol (SPI) and CAN SAE J1939 upon request.
Switch output	Upon request. Programmable.
Angular Resolution (depends on electrical angle and rotational speed)	Analog & PWM: up to 12 bits. Serial protocol (SPI): up to 14 bits.
Supply voltage ¹	Up to 25V.
Supply current	Typ 8.5mA for single version. Typ 17mA for redundant version.

¹ Others: check availability. Ferromagnetic materials close to the sensor (i.e. shaft, mounting surface) may affect the sensor's linearity. Please contact Piher for advise.

² CAN protocol model: physical dimensions may vary. Check available versions before ordering.

Key features

- Simple and robust magnetic design.
- High resolution (up to 14-bit).
- Ratiometric analog or PWM.
- Absolute position feedback up to 360° (keeps position on power loss).
- True full redundant version.
- Sealed construction for harsh environments such as off-highway and marine.
- Protected from dust, moisture, vibration and extreme temperatures.
- Endless rotation.
- Fully programmable transfer function output at the factory with electrical outputs up to 360°.
- Self-diagnostic features.
- Over voltage protection and reverse voltage protection.
- Extended voltage input supply values.

Also upon request:

- Programmable switch output.
- CAN and SPI output.

Industries served

- Automotive and On-highway (road vehicles, trucks, recreational vehicles, road sweepers).
- Off-highway (agriculture, construction and forestry, motorsport, airport operations).
- Material handling.
- Marine engines.
- Medical.
- Industrial.

Applications

- Non-contacting long life angle / position sensor.
- Absolute rotary position sensor.
- Pedal position sensor.
- Throttle / EGR valve and gear position sensor.
- Height and suspension sensor.
- Motor-shaft position sensor.
- Pivot point angle sensing.
- Off road / highway steering.
- Agricultural machinery hydraulic lift arms, scoops, articulation/joints.
- Forklifts / material handling.
- Industrial pumps.
- Accelerator / Steering / Shifter position sensor for marine outboard engine.
- Precision robotics, industrial equipment, HVACR monitoring & control, etc.

Piher Sensing Systems

Our product competencies and services:
Potentiometers | [Position / angle sensors](#) | Rotary switches | Incremental encoders
Printed electronics | Mechatronics | Value added assemblies

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How to order (example: PST360G2-1A-C0018-ERA190-05K)

Simple output



Redundant output



Full redundant output



Other product configurations will be studied case by case.

Notes

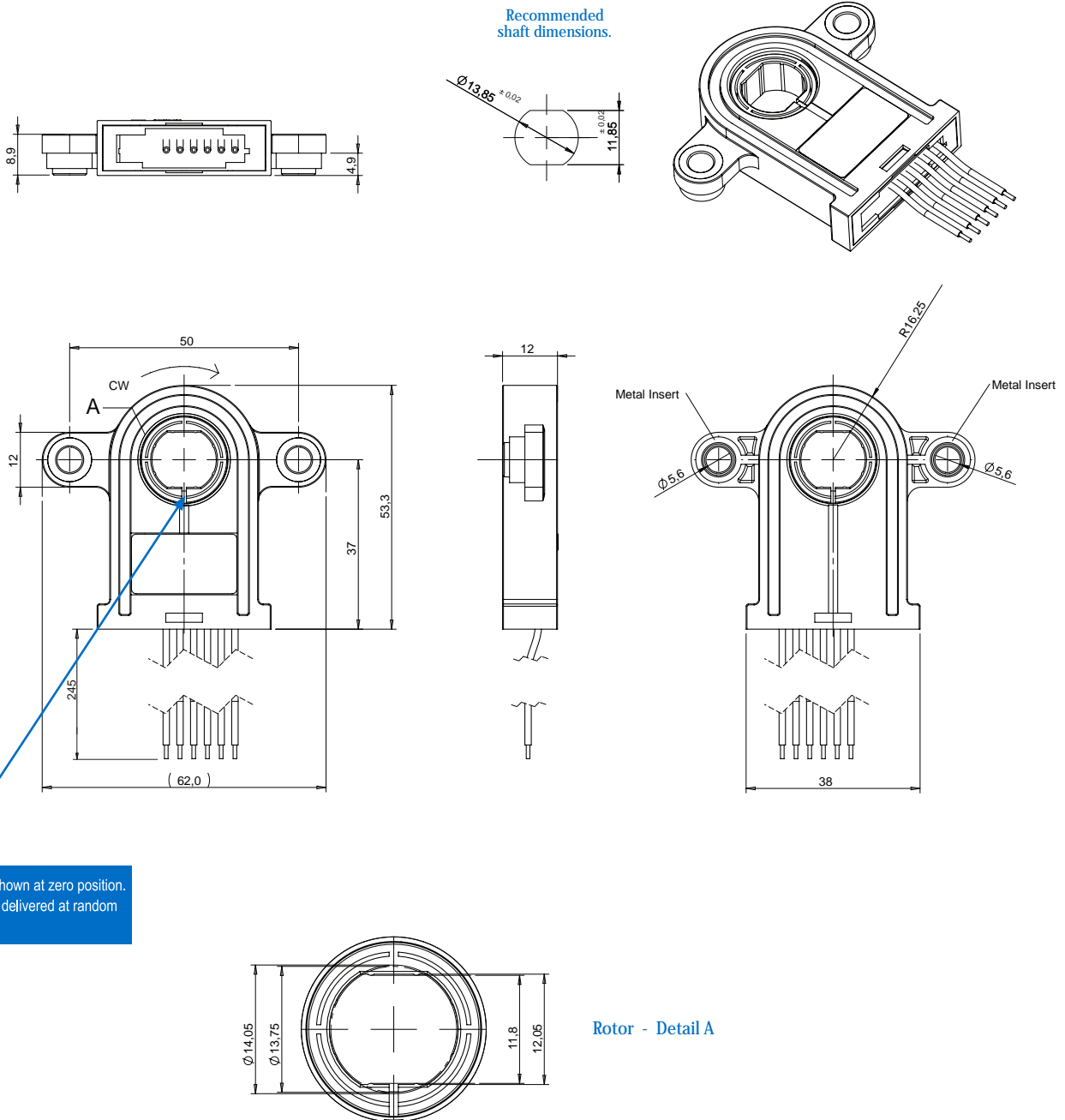
- (1) Other rotors: check availability.
- (2) The analog output is a ratiometric output, proportional to:
 - For supply voltage 5V: to input supply voltage.
 - For supply voltage RE: to 5V.
- (3) 05: 5V ±10%
RE: 7V - 25V
- (4) Other output functions available check availability. In the How To Order reference, enter CXXX meanwhile the new output function reference is not defined.
E.g.: PST360-1A-CXXX-ERA190-05K
- (5) Leave empty if no applicable. Default frequency is 200 Hz

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Dimensions

Hollow shaft diameter 14mm.



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Dimensions

Hollow shaft diameter 17mm.



Rotor is shown at zero position.
Sensor is delivered at random position.

Mounting instructions

- 1.- Place the component on a flat surface.
- 2.- Fit the shaft of the application (see recommended shaft dimensions) through the sensor's rotor avoiding any mechanical play/wobble.
- 3.- Fasten the two M5 screws (M5 washers are recommended).

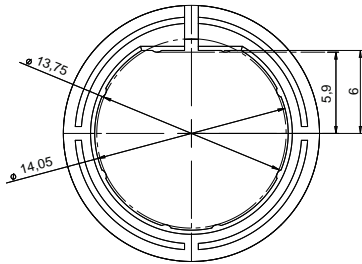
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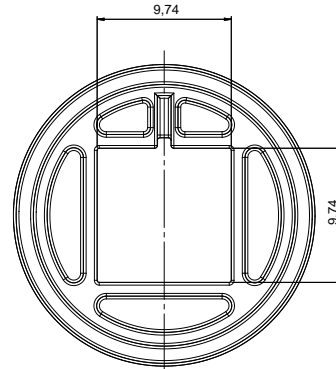
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Special rotors



Ref. 3457
Special rotor upon request



Ref. 3458
Special rotor upon request

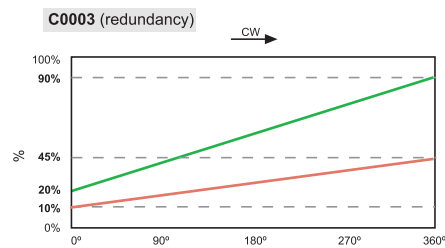
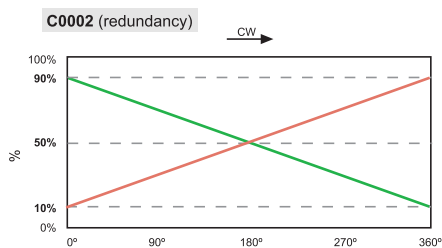
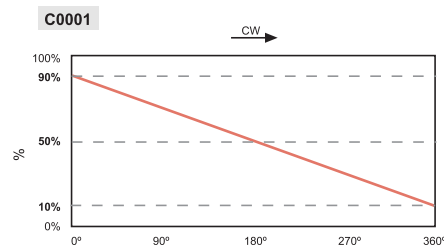
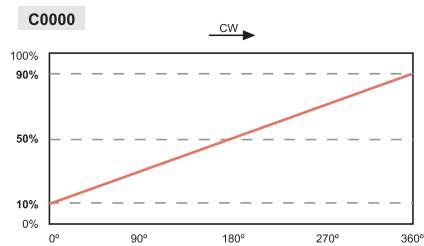
Connections scheme

Simple analog output connection wiring scheme. Other versions available upon request.

- Brown = Power supply.
- Blue = Ground.
- Black = Signal output.
- White = Not used.
- Grey = Not used.

Fly leads with Wire: 0.35mm². TXL SAE J1128.
Check availability for the connector options.

Output examples



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Mechanical specifications

Vibration	EN 60068-2-6	5-2000 Hz; 20g; Amax 0,75 mm
Shock	EN 60068-2-27	50g
IP sealing	IEC 60529	IP67
Operating & storage temperature	°C	-40 to +125
Life	movements	no limit
Mechanical range	degrees	360 (continuous rotation)

Check availability for other specifications

Standards

CISPR 16-2-3 class B emission radiated (30 ... 230MHz)	max. 30 dB (µV/m)
CISPR 16-2-3 class B, emission radiated (230 ... 1000MHz)	max. 37 dB (µV/m)
EN 61000-4-2, ESD on housing and connections (contact/air)	±4 / ±8 kV
EN 61000-4-4, Burst (on supply lines / signal lines)	±1 kV
EN 61000-4-5, Surge (on supply lines / signal lines)	±1 kV
EN 61000-4-3, immunity HF radiated (80 ... 2000 MHz)	10 V/m
EN 61000-4-6, immunity HF conducted (0,15 ... 80MHz)	10 Vemk
EN 61000-4-8, immunity magnetic field (50 Hz)	30 A/m

Disclaimer

Ferromagnetic parts close to the sensor, including the shaft, may modify the performance of the sensor. Therefore, this has to be communicated to Piher for prior analysis.

No external magnetic perturbations are considered on the application where the sensor is mounted. If so, amplitude and direction of flux density generator type and characteristics (magnet, cable, motor...) must be notified to Piher.

The product information in this catalogue is for reference purposes. Please consult for the most up to date and accurate design information.

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