

## 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 <sup>1</sup>	-40°C to +125°C

## Electrical specifications

Linearity <sup>1</sup>	±1% absolute (0.5% upon request)
Angular range	Programmable from 40 to 360 degrees (others upon request)
Output <sup>2</sup>	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 bit Serial protocol (SPI): up to 14 bit
Supply voltage <sup>1</sup>	Up to 25V
Supply current	Typ 8.5mA for single version Typ 17mA for redundant version

<sup>1</sup> 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.

<sup>2</sup> 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
- Factory automation
- 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

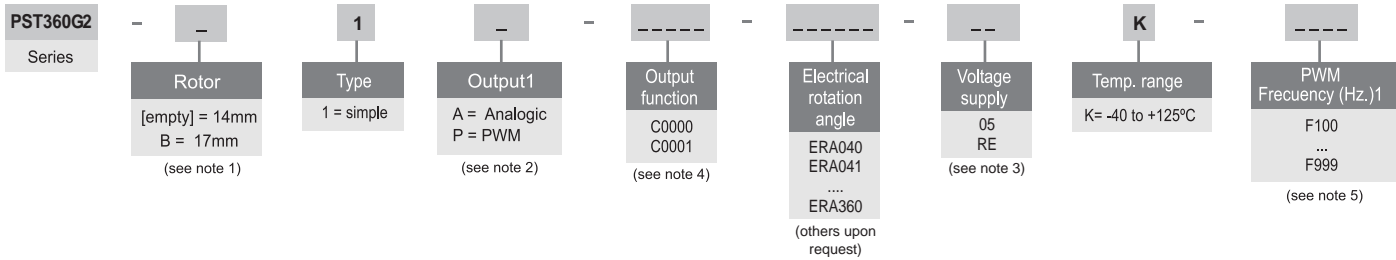
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Printed electronics | Value added assemblies

# Magnetic rotary hollow-shaft position sensor/control

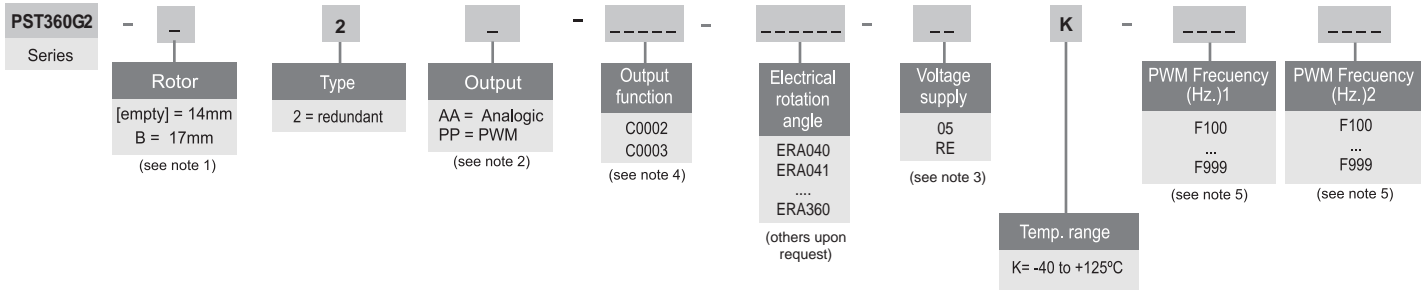
## Contactless sensor PST-360

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

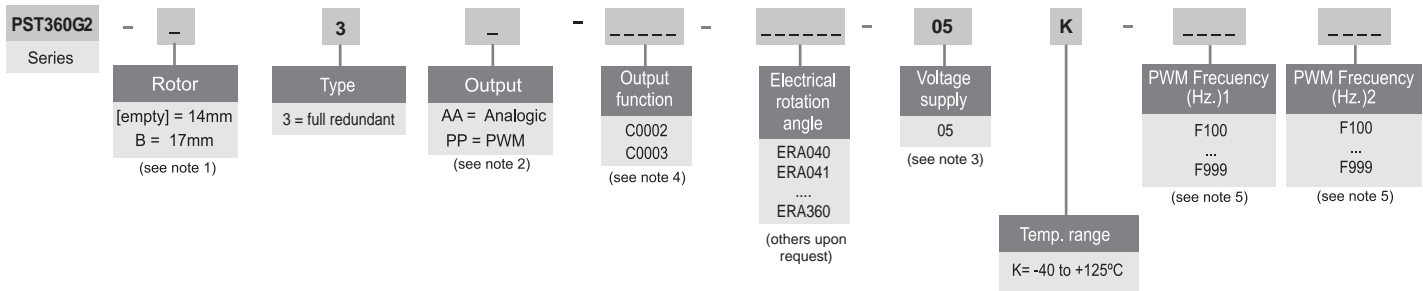
#### Simple output



#### Redundant output



#### Full redundant output



Other product configurations will be studied case by case.

#### Notes

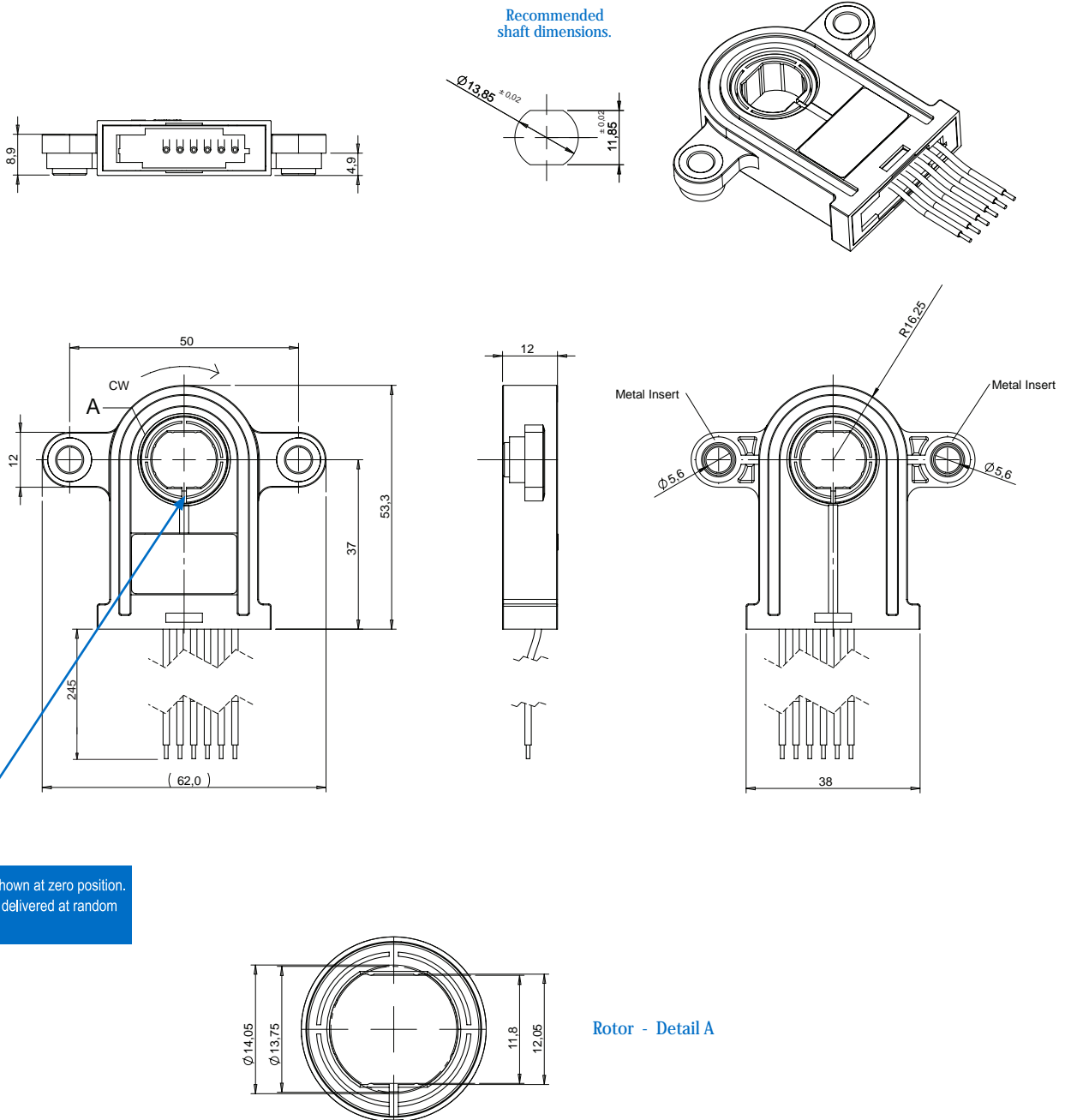
- (1) Other rotors: check availability.
- (2) The analog output is a ratiometric output, proportional to:
  - For supply voltage 5V: to input supply voltage.
  - For supply voltage RE: to 5V.
- (3) 05: 5V ±10%  
RE: 7V - 25V
- (4) Other output functions available check availability. In the How To Order reference, enter CXXXX meanwhile the new output function reference is not defined.  
E.g.: PST360G2-1A-CXXXX-ERA190-05K
- (5) Leave empty if no applicable. Default frequency is 200 Hz

# Magnetic rotary hollow-shaft position sensor/control

## Contactless sensor PST-360

### Dimensions

Hollow shaft diameter 14mm.



Download the STEP file here:  
<https://piher.net/piher/?p=932>

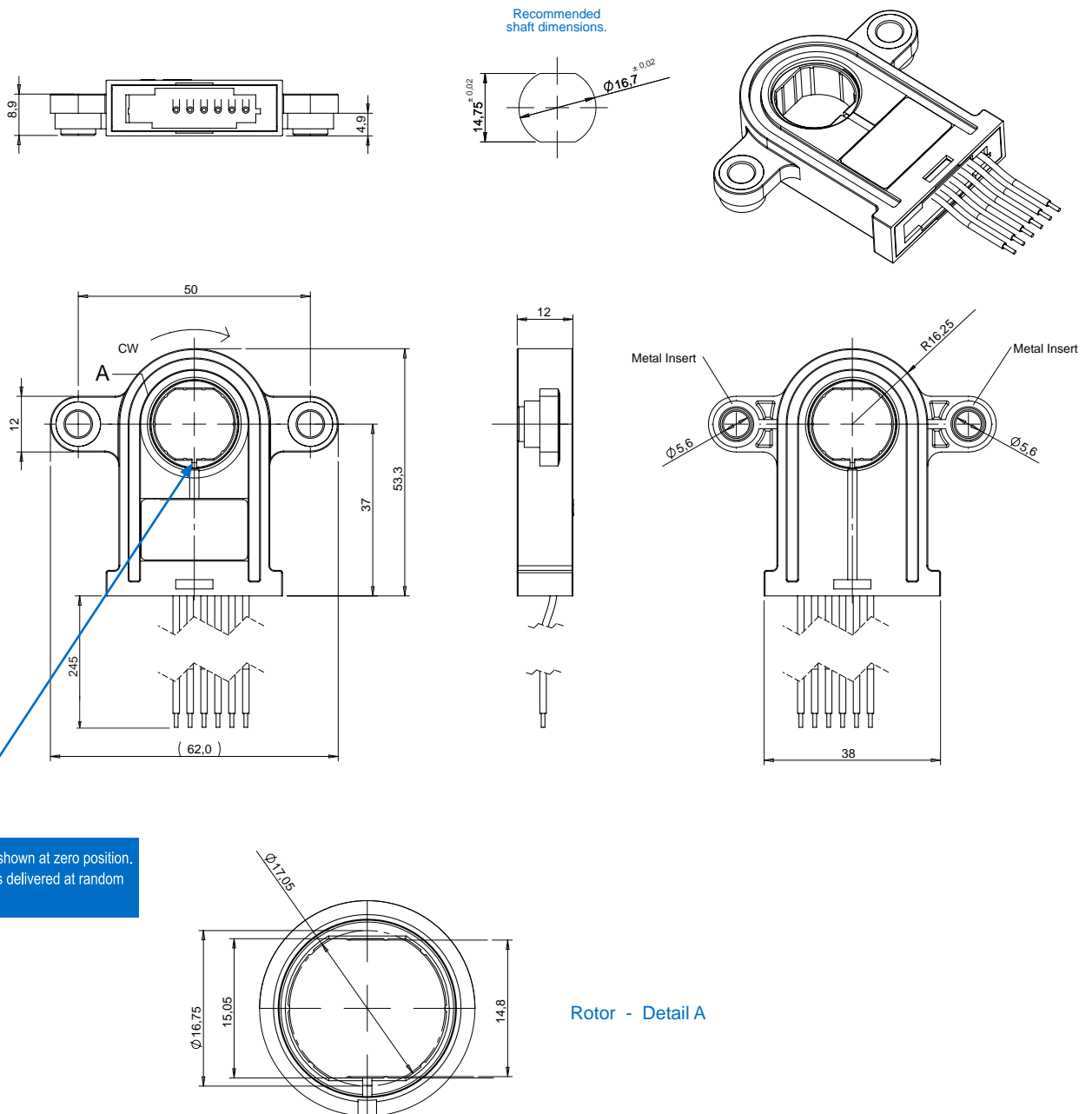
# Magnetic rotary hollow-shaft position sensor/control

## Contactless sensor

### PST-360

### Dimensions

Hollow shaft diameter 17mm.



### 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).

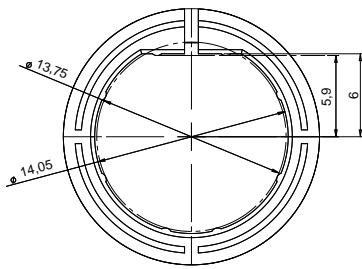
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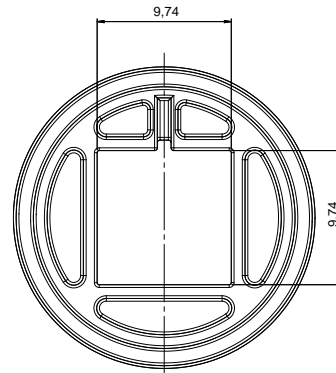
## Magnetic rotary hollow-shaft position sensor/control

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### Special rotors



Ref. 3457  
Special rotor upon request



Ref. 3458  
Special rotor upon request

### Connections scheme

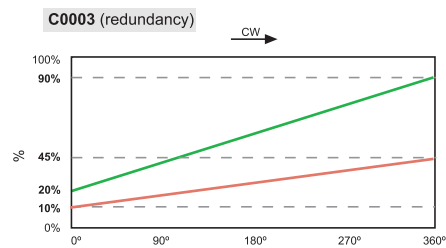
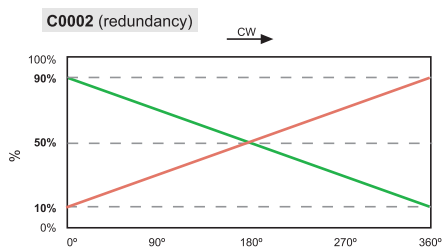
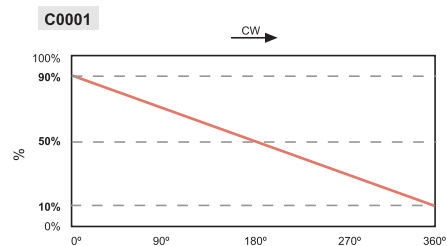
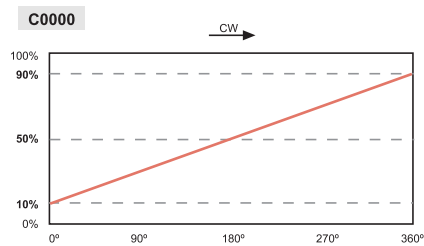
Simple analog output connection wiring scheme. Other versions available upon request.

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

Instructions  
of use available at  
[www.piher.net](http://www.piher.net)

Fly leads with Wire: 0.35mm<sup>2</sup>. 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



EN 55022, class B, emission radiated (30 ... 230MHz)	max. 30 dB (µV/m)
EN 55022, class B, emission radiated (230 ... 1000MHz)	max. 37 dB (µV/m)
EN 61000-4-2, ESD (contact discharge / air discharge)	±4 / ±8 kV
EN 61000-4-3, Immision HF radiated (80...1000MHz/1.4...2.0GHz)	10 V/m and 1 V/m 2.0GHz-2.7GHz
EN 61000-4-4, Burst (on supply lines / signal lines)	±1 kV
EN 61000-4-6, Immision HF conducted (0.15...80MHz)	10 Vemk
EN 61000-4-8, Immision magnetic field (50Hz)	30 A/m

These standards apply to analogic-simple and analogic-redundant models. For other models please contact Piher.  
EMC testing according to the standards EN 61000-6-2 & EN 61000-6-3

### 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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