Enabling the Electronics Revolution

PIHER sensing systems
an Amphenol® company

# PS2P-ARC

## Play Resistant Arc Position Sensor

Available with CAN



**True touchless operation**
Without any internal or external gears or linkages the sensor is easily assembled and calibrated and free from wear and tear over lifetime.

**Immune to radial and axial play**
Maintains stable electrical output and specified linearity despite radial and axial tolerances avoiding performance loss and maintenance cost.

**Made for harsh environments**
IP69K sealing, high operating temperature range as well as shock and vibration resistance allow the use in the most demanding environments.

**Compact and low profile package**
Without the need for a shaft the sensor is provided in a exceptionally compact and low profile package that fits in space contraint applications.

**Unlimited mechanical life**
The separation of electronics and magnet module allows for a virtually unlimited lifetime independent of number of revolutions.

**Adaptable to your requirements**
Custom mechanical design, programmable transfer function and switch outputs as well as different output protocols and redundancy levels available.

### DESCRIPTION

Piher Sensing Systems' PS2P-ARC position sensor creates immunity to radial and axial play on pivot joints where misalignment result in poor operational performance and labor intensive maintenance programs.

The magnet is attached to the rotating parts of a pivot joint and the electronics module to the chassis (or vice versa). Without the need for any gears or linkages the sensor is easy to mount thereby delivering additional cost reduction on the production line and improving product reliability and durability during its lifetime.

The PS2P-ARC measures changes in position relative to the sensor by detecting the movement of a sinusoidal magnetized arc magnet that is located in a separate housing and is only sensitive to the flux density co-planar with the IC surface.

The PS2P series is complemented by touchless linear (PS2P-LIN) and angular (PS2P-CON) position sensors. All sensors of the series will deliver the same level of precision and stability throughout their lifetime as on the first day they are installed - despite extremes of vibration, shock, temperature and contamination. As absolute sensors they will not loose the values even after a power failure.

### APPLICATIONS

**Off-Highway**
- Tractor hitch position
- Boom loader position
- Excavator bucket position
- Telehandler position
- Forklift height and tilt
- Articulated vehicles pivot joint position

**Automotive**
- Active suspension

**Marine**
- Marine steering and throttle control
- Hydraulic arm position

**Industrial**
- Robotic arm position



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# PS2P-ARC

## Play Resistant Arc Position Sensor

### MECHANICAL SPECIFICATIONS

| | |
|---|---|
| Life | Virtually unlimited |
| Air gap | 2mm ±1mm |
| Magnet radius | 23mm (Model M009)<br>31mm (Model M008) |

### ELECTRICAL SPECIFICATIONS

| | | |
|---|---|---|
| Linearity[1] | Analog, PWM<br>CAN | ±1% absolute (±0.5% upon request)<br>±3 degrees absolute |
| Angular range[2] | | 110 degrees<br>90 degrees<br>45 degrees |
| Output protocol[3] | | Analog (Ratiometric)<br>PWM<br>CAN Open<br>CAN SAE J1939 |
| Output function | Standard<br>Inverted<br>Redundant | 10% to 90% Vdc (CW)<br>90% to 10% Vdc (CCW)<br>10% to 90% Vdc (CW and CCW) |
| Switch | | Programmable on request |
| Resolution | | Up to 12 bit |
| Supply voltage | Analog and PWM<br>CAN | 5V ±10%<br>7V to 15V (25V on request)<br>7V to 32V |
| Supply current | Single version<br>Redundant version<br>CAN version | Typ 8.5 mA<br>Typ 17 mA<br>Typ 47 mA |
| Voltage protection | | ±10V |
| Self-diagnostic features | | Yes |

1 Results may vary depending on the ferromagnetic environment. Contact Piher for further support.
2 Other electrical rotational angles on request.
3 CAN protocol available for simple output versions only.

### ENVIRONMENTAL SPECIFICATIONS

| | | |
|---|---|---|
| Operating and storage temperature[1] | Analog, PWM<br>CAN | -40°C to +125°C<br>-40°C to +85°C |
| Shock | | 50g |
| Vibration | | 10-2000 Hz; 10g; $A_{max}$ 0,75 mm |
| Sealing | | IP67, IP69K |

[1] Other specifications available.

### CONNECTION SCHEME

| Color | Simple output | | Redundant output | | Full-redundant output | CAN |
|---|---|---|---|---|---|---|
| | 5V | 7V to 15V | 5V | 7V to 15V | | |
| Brown | Power supply | Power supply | Power supply | Power supply | Power supply 1 | Power supply |
| Blue | Ground | Ground | Ground | Ground | Ground 1 | Ground |
| Black | Signal output | Signal output | Signal output 1 | Signal output 1 | Ground 2 | CAN High |
| White | n/a | n/a | Signal output 2 | Signal output 2 | Signal output 2 | CAN Low |
| Red | n/a | n/a | n/a | n/a | Power supply 2 | n/a |
| Yellow | n/a | n/a | n/a | n/a | Signal output 1 | n/a |
| Grey | n/a | Not used | n/a | Not used | n/a | n/a |

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



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# PS2P-ARC

## Play Resistant Arc Position Sensor

### HOW TO ORDER (Example: PS2P-ARC-CE-M008-A-110S-05)

#### Simple output

PS2P-ARC - __ - ____ - _ - ___ _ - __

| Series | Magnet position | Magnet model | Output protocol[1] | Electric rotational angle[2] | Output function | Voltage supply[3] |
|---|---|---|---|---|---|---|
| | CE = on top<br>LA = lateral | M008<br>M009 | A = analogic<br>P = PWM<br>J = CAN SAE J1939<br>O = CAN OPEN | 110<br>090<br>045 | S = standard / CW<br>I = inverted / CCW | 05 = 5V ±10%<br>RE = 7V-15V (A/PWM) / 7V-32V (CAN) |

#### Redundant output

PS2P-ARC - __ - ____ - _ - ___ R - __

| Series | Magnet position | Magnet model | Output protocol[1] | Electric rotational angle[2] | Output function | Voltage supply[3] |
|---|---|---|---|---|---|---|
| | CE = on top<br>LA = lateral | M008<br>M009 | A = analogic<br>P = PWM | 110<br>090<br>045 | R = redundant | 05 = 5V ±10%<br>RE = 7V-15V |

#### Full-redundant output

PS2P-ARC - __ - ____ - _ - ___ F - 05

| Series | Magnet position | Magnet model | Output protocol[1] | Electric rotational angle[2] | Output function | Voltage supply[3] |
|---|---|---|---|---|---|---|
| | CE = on top<br>LA = lateral | M008<br>M009 | A = analogic<br>P = PWM | 110<br>090<br>045 | F = full-redundant | 05 = 5V ±10% |

1 The analog output is ratiometric, proportional:
- for supply voltage "5V" to input voltage;
- for supply voltage "RE" to 5V.

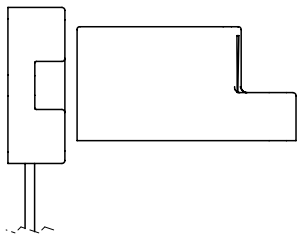
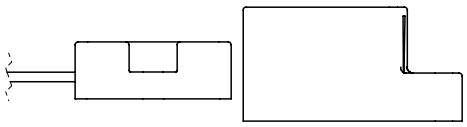
Default frequency for PWM versions is 200 Hz. Others on request.

2 Other electrical rotational angles on request.

3 CAN models are available in 7V-32V. For other voltages up to 25V: check availability.

check inventory

### MAGNET POSITION

| On Top | Lateral |
|---|---|
|  |  |



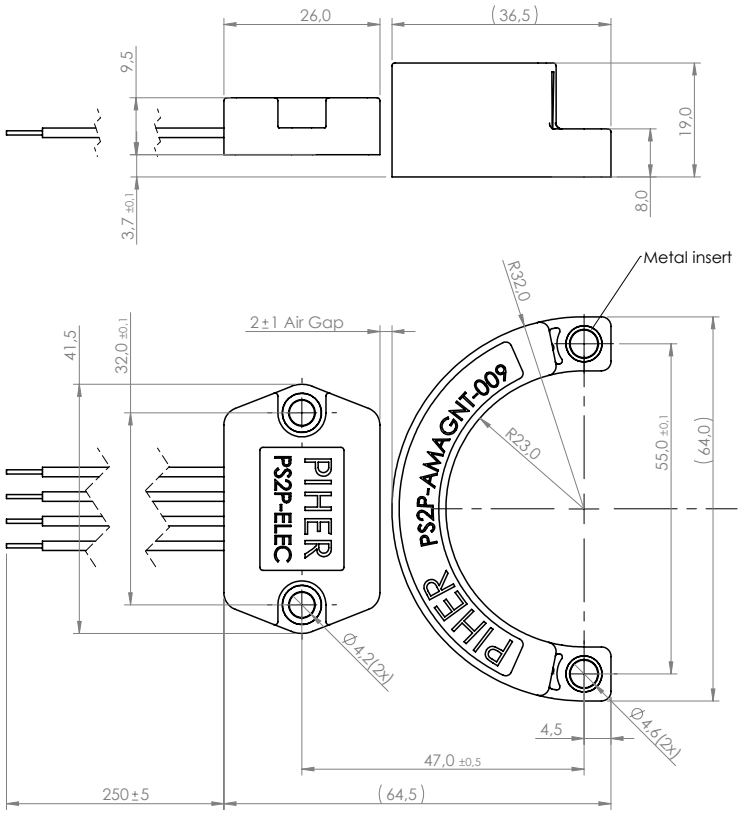
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# PS2P-ARC

## Play Resistant Arc Position Sensor

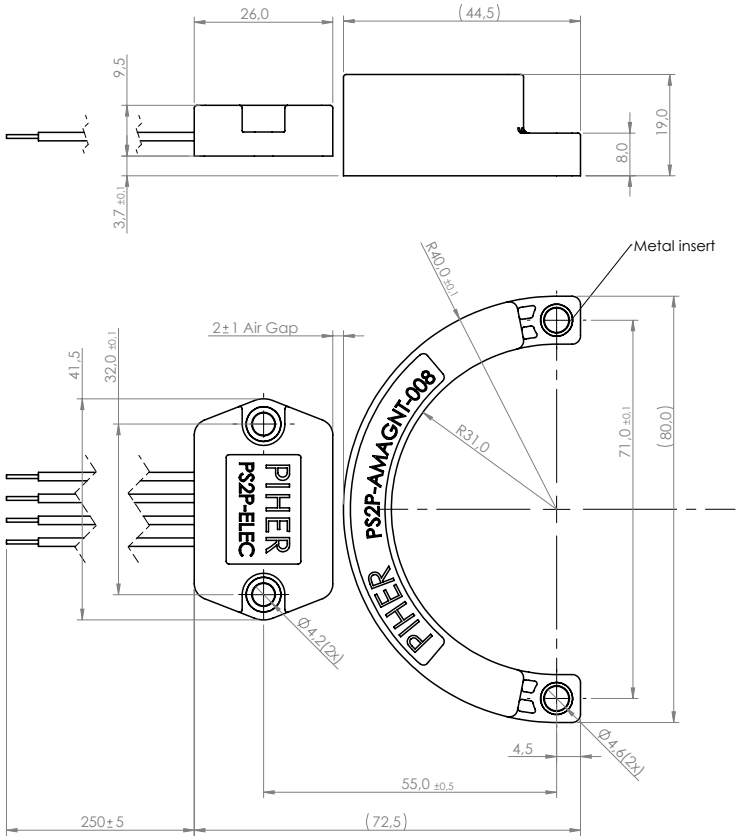
### DIMENSIONS (MM)

#### Magnet M009 (23mm radius)




Download the 3D model here:
www.piher.net

#### Magnet M008 (31mm radius)




Magnet shown in 0° degree position.

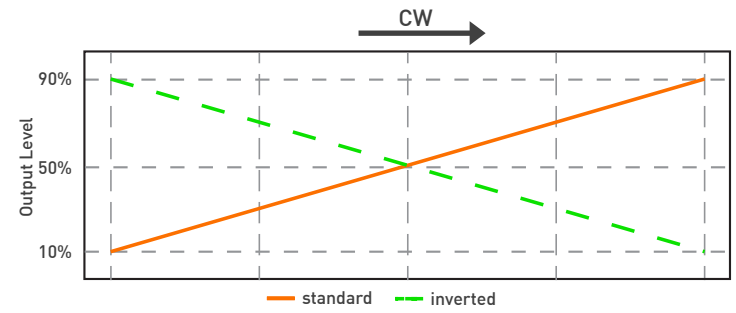


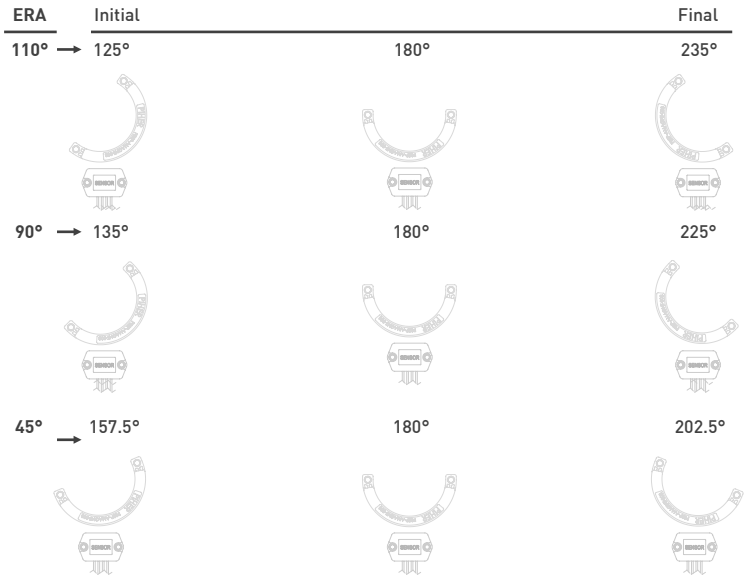

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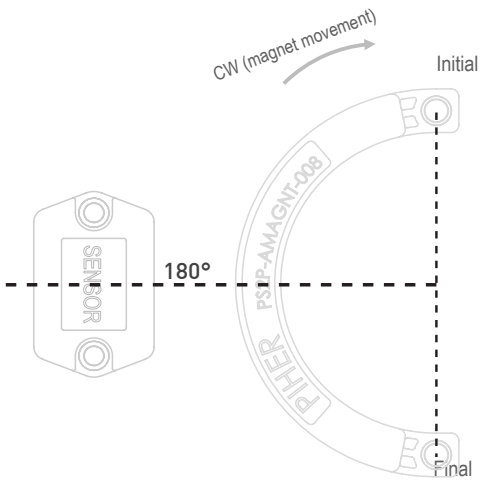
# PS2P-ARC

## Play Resistant Arc Position Sensor

### OUTPUT CURVE

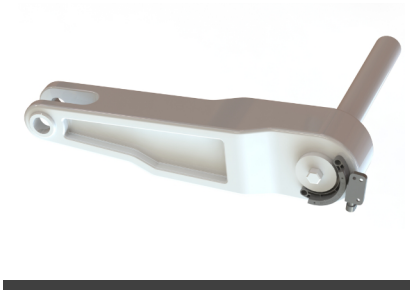


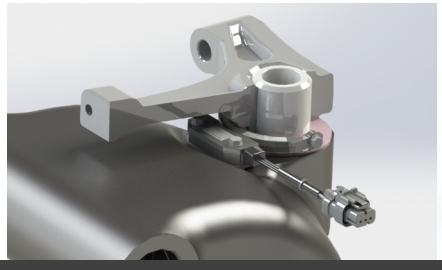




ERA: Electrical Rotational Angle.
Custom output functions available on request.

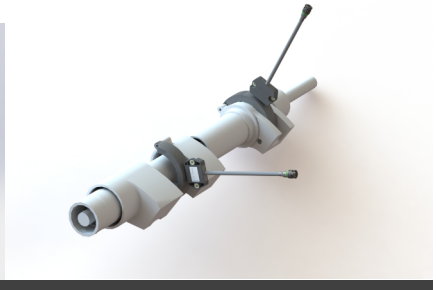
### APPLICATION EXAMPLES



Tractor Rear Hitch Position



Marine Outboard Steering



Active Suspension System (Torsion

IATF 16949 Automotive Quality Management CERTIFIED

ISO 9001 Quality Management Systems CERTIFIED

ISO 14001 ISO 45001 BUREAU VERITAS Certification

RoHS REACH compliant

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