

Magnetic rotary angle and position sensor-control

Rotary concentric touchless sensor

PS2P-CON



Main features

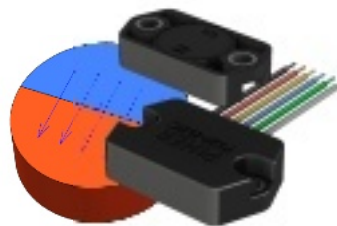
- True touchless operation: free from wear and tear.
- Low profile & robust magnetic design that easily adapts to your design.
- Selectable output: analogue (ratiometric) or PWM. SPI upon request.
- Programmable angular range up to 360 degrees.
- Nominal air gap: 3mm between plastic parts.
- Maximum air gap: 5mm. For higher air gap: check availability.
- Maximum magnet radial offset allowed: ± 3 mm. (Measured directly on non-ferromagnetic material. For other configurations check with Piher.)
- Resolution: analogue & PWM: 12 bits / SPI: 14 bits.
- Linearity: $\pm 1\%$ absolute ($\pm 0.5\%$ upon request).
- Over voltage protection.
- Reverse voltage protection.
- Supply voltage up to 25V.
- Programmable Linear Transfer Characteristic. (Some positive slopes & one negative slope can be programmed in the same transfer characteristic; up to 4 programmable points)
- Unlimited mechanical life.
- High vertical & lateral tolerance to magnet misalignment.
- Simple, redundant and full redundant versions available.
- Sealed for harsh environments.
- Operating temperature: -40°C to $+125^{\circ}\text{C}$.
- Self-diagnostic features.

Touchless working principle

Measurement of angular position using variation of magnetic field amplitude induced by the displacement of a moving magnet has been intensively developed over the last fifteen years. However, these solutions have limits in terms of angular range and temperature influence.

The technology used by Piher is only sensitive to the flux density coplanar with the IC surface.

The angular information is computed from both vectorial components of the flux density (i.e. BX and BY) of a magnet. Then an output signal proportional to the decoded angle is produced.



Markets served

- Automotive
- Industrial
- Marine
- Off-highway
- Transportation

Description

Something that is truly contactless. One magnet, One electronics module. No gears. Nothing to wear out over a lifetime.

A sensor that will deliver the same level of precision and stability throughout its life as the first day it was installed - despite extremes of vibration, shock, temperature and contamination. Something that is easy to assemble - delivering additional cost reduction on the production line.

Something that can be fitted anywhere on the pivoting shaft, giving engineers the flexibility to be creative.

Our touchless sensor is Piher Sensing Systems at its best, packaging its core technology - slimline magnetic Hall Effect sensing - into something truly original.

Sensing the position, avoiding contact

The concentric touchless linear sensors create immunity to magnet's misalignment that negatively impacts operational performance and results in labour intensive maintenance programmes. It complements our linear and variable air-gap touchless series of non-contact angular rotary position sensors.

The magnet is attached to the moving parts whose displacement is to be measured, such as hydraulic/pneumatic controls or gear selector, and the electronics module is fixed to the chassis (or vice versa).

As absolute sensors, they will not lose the values even after a power failure.

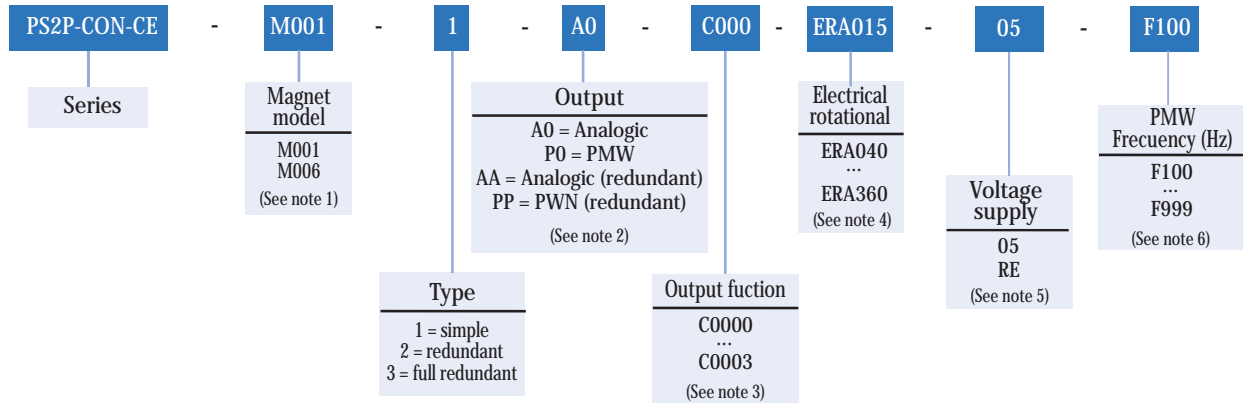
All Piher touchless sensors are compact, sealed, low-profile, yet extremely rugged and can be custom-engineered to fit customer's specifications and existing mechanical assemblies.

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How to order (example: PS2P-CON-CE-M001-1A0-C000-ERA015-05-F100)



NOTES

(1) **M001**
Magnet for concentric rotary sensing

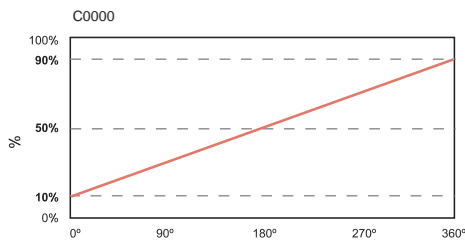


M006
Magnet for concentric rotary sensing

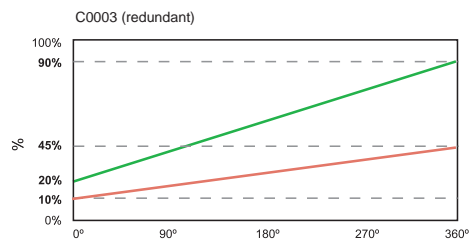
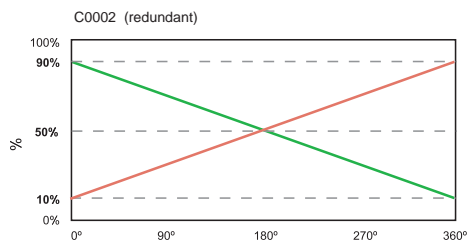
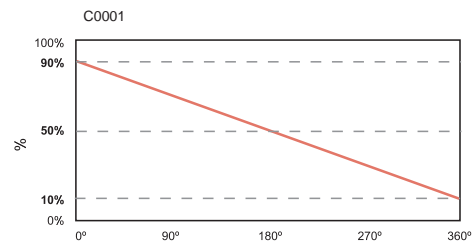


(2) The analog output is a ratiometric output, proportional to:
 - For supply voltage 5V: to input supply voltage.
 - For supply voltage RE: to 5V.

(3) Other output functions available check availability.
 In the How To Order reference, enter CXXXX meanwhile the new output function reference is not defined.
 Standard output functions:



→ CW



(4) ERA = electrical rotational angle measured in degrees. Examples:
 ERA040 = 15 degrees electrical rotational angle (lower angles upon request)
 ERA150 = 150 degrees electrical rotational angle
 ERA360 = 360 degrees electrical rotational angle

(5) 05: 5V ±10%
 RE: 7V - 25V
 RE not available for full redundant versions.

(6) Leave empty if no applicable. Default frequency is 200 Hz
 For redundant versions, please, write both frequencies: -FXXXXFXXX

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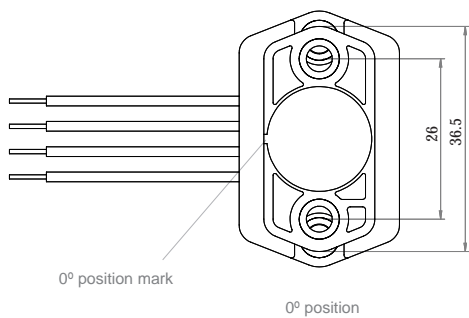
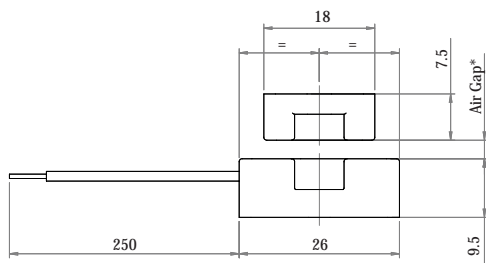
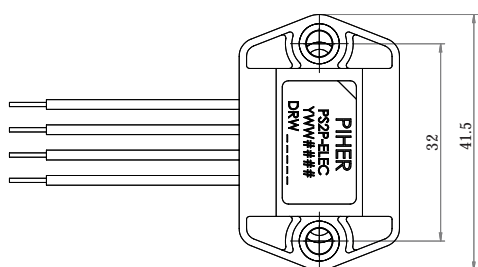
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Dimensions

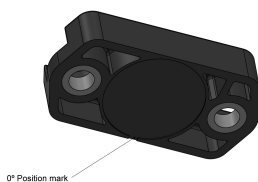
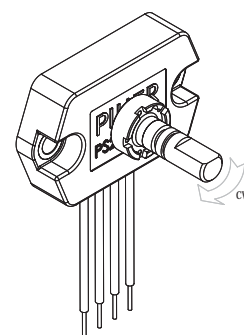
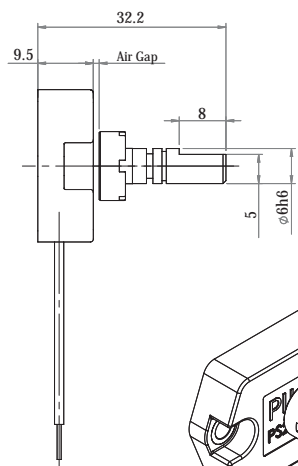
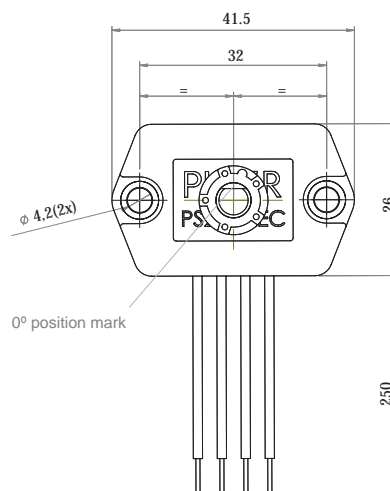
Drawings may not be to scale. Number and function of wires pictured in this datasheet may vary according to the selected output configuration.

Dimensions in mm with magnet M001



* Nominal air gap: 3mm
For higher air gap please contact sales@piher.net

Dimensions in mm with magnet M006



Instructions
of use available at
www.piher.net



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

PS2P-CON. Specifications & standards

Rotary concentric touchless sensor

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 environment 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 for a magnetic simulation analysis update.

The information in this sheet is preliminary and for reference purposes only. Please consult for the most up to date and accurate design information.

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