Enabling the Electronics Revolution

PIHER sensing systems
an Amphenol® company

PS2P-CON

Touchless Concentric Rotary Hall-Effect Position Sensor

KEY FEATURES

Touchless Sensor

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.

Virtually unlimited life

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

IP67 IP69K

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 size

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.

Fully customizable

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-CON rotary position sensor delivers true touchless sensing for harsh industrial and vehicle environments in a low profile and robust magnetic design.

Magnet and sensor module are placed in separate housings without the need for any gears, bearings or linkages and can be placed anywhere on the pivoting shaft. This allows for easy mounting, thereby delivering additional cost reduction on the production line. Furthermore, without wear and tear of radial forces product reliability and lifetime are increased significantly.

The PS2P-CON measures changes in angular position relative to the sensor by detecting the movement of a diametrically magnetized 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 variable air gap arc (PS2P-ARC) position sensors. All sensors of the series are absolute sensors and 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.

APPLICATIONS

Off-Highway
- ▶ Bucket position
- ▶ Pedal / throttle position
- ▶ Hitch position
- ▶ Bus suspension / kneeling position
- ▶ Transmission systems

Automotive
- ▶ Gear selector
- ▶ Transmission systems

Home & Building Automation
- ▶ HVAC damper actuator monitoring

Marine
- ▶ Trim / tilt position

Industrial
- ▶ Robotic / hydraulic arm position
- ▶ Valve monitoring
- ▶ IoT modules
- ▶ Vacuum circuit breaker monitoring

PS2P-CON

Touchless Concentric Rotary Hall-Effect Position Sensor

MECHANICAL SPECIFICATIONS

	With magnet M001	With magnet M006
Life	Virtually unlimited	
Nominal air gap	3mm, between plastic parts	1mm, between plastic parts
Maximum air gap	5mm, higher on request	1.5mm, higher on request
Maximum allowed radial offset	±3mm	Contact Piher Sensing Systems

ELECTRICAL SPECIFICATIONS

Linearity[1]		±1% absolute (±0.5% upon request)
Angular range		Programmable from 15 to 360 degrees
Output protocol		Analog (Ratiometric), PWM Serial Protocol (SPI) upon request
Output		Simple Redundant Full-redundant
Switch Output		On request
Resolution	Analog, PWM SPI	Up to 12 bit Up to 14 bit
Supply voltage[2]		5V ±10% 7V to 15V
Supply current	Single version Redundant version	Typ 8.5 mA Typ 17 mA
Voltage protection		±10V
Self-diagnostic features		Yes

[1] Ferromagnetic materials close to the sensor (i.e. shaft, mounting surface) may affect the sensor's linearity.
[2] Voltages up to 25V possible on request.

ENVIRONMENTAL SPECIFICATIONS

Operating and storage temperature[1]	-40° to +125°C
Shock	50g
Vibration	5Hz to 2000 Hz; 20g; A_{max} 0,75 mm
Sealing[2]	IP67, IP69K
Approval	CE[2]

[1] Other specifications available
[2] CE-approval applies to analogic models.

EMI/EMC Testing

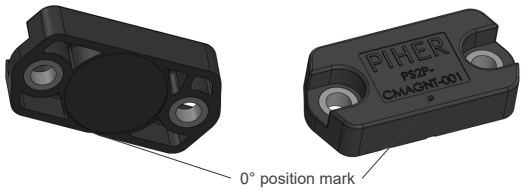
Characteristic	Standard	Level
Radiated emissions	CISPR 16-2-3 class B	30 MHz to 230 MHz, max. 30dB (µV/m) 230 MHz to 1000 MHz, max. 37dB (µV/m)
ESD on housing and connections	EN 61000-4-2:2009	±4 kV contact ±8 kV air
Burst (on supply lines / signal lines)	EN 61000-4-4:2012	±1kV
Surge (on supply lines / signal lines)	EN 61000-4-5:2014	±1kV
Immunity HF radiated (80 ... 2000 MHz)	EN 61000-4-3:2006	10 V/m
Immunity HF conducted (0,15 ... 80MHz)	EN 61000-4-6:2014	10 Vemk
Immunity magnetic field (50 Hz)	EN 61000-4-8:2010	30 A/m

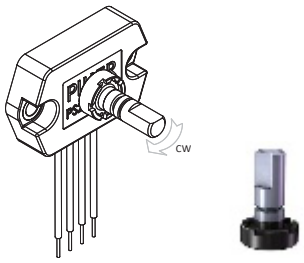
PS2P-CON

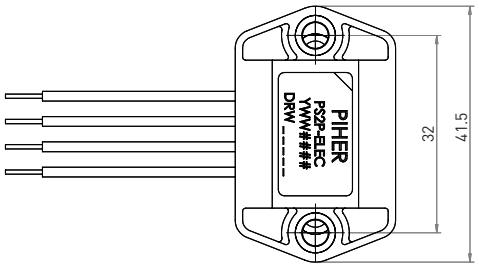
Touchless Concentric Rotary Hall-Effect Position Sensor

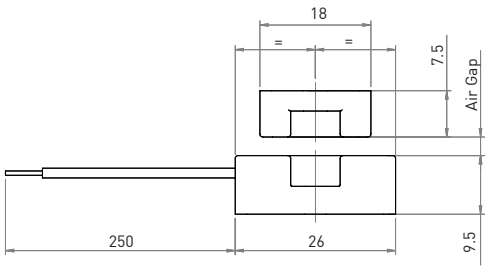
DIMENSIONS (MM)

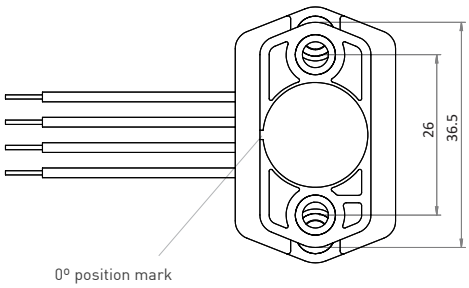
PS2P-CON-CE-M001	PS2P-CON-CE-M006

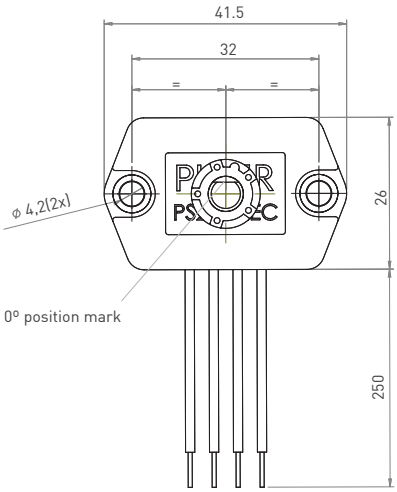


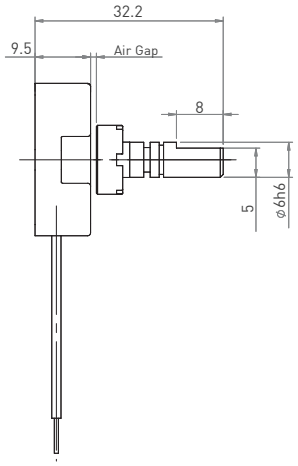












Download the STEP file here:
www.piher.net

Magnet shown on 0° position. Drawings may not be to scale. Number and function of wires pictured in this datasheet may vary according to output configuration.

PS2P-CON

Touchless Concentric Rotary Hall-Effect Position Sensor

HOW TO ORDER (Example: PS2P-CON-CE-M001-1A0-C0000-ERA360-05)

Simple Output

PS2P-CON-CE - ___ - 1 __ - C____ - ERA___ - __ - ____

Series	Magnet Model	Type	Output[1]	Output function[2]	Electric rotational angle[3]	Voltage supply[4]	PWM Frequency Hz[5]
	M001 M006	1 = simple	A0 = analogic P0 = PWM	C0000 C0001	ERA040 ERA041 ... ERA360	05 = 5V ±10% RE = 7V-15V	[empty] = 200Hz F100 = 100Hz F101 = 101Hz ... F999 = 999Hz

Redundant output

PS2P-CON-CE - ___ - 2 _ - C____ - ERA___ - __ - ____ ____

Series	Magnet Model	Type	Output[1]	Output function[2]	Electric rotational angle[3]	Voltage supply[4]	PWM Frequency Hz (1)[5]	PWM Frequency Hz (1)[5]
	M001 M006	2 = redundant	AA = analogic PP = PWM	C0002 C0003	ERA040 ERA041 ... ERA360	05 = 5V ±10% RE = 7V-15V	[empty] = 200Hz F100 = 100Hz F101 = 101Hz ... F999 = 999Hz	[empty] = 200Hz F100 = 100Hz F101 = 101Hz ... F999 = 999Hz

Full-redundant output

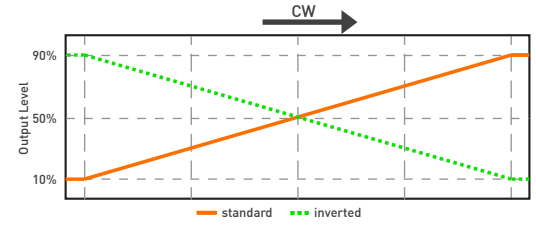
PS2P-CON-CE - ___ - 3 _ - C____ - ERA___ - 05 - ____ ____

Series	Magnet Model	Type	Output[1]	Output function[2]	Electric rotational angle[3]	Voltage supply	PWM Frequency Hz (1)[5]	PWM Frequency Hz (1)[5]
	M001 M006	3 = full-redundant	AA = analogic PP = PWM	C0002 C0003	ERA040 ERA041 ... ERA360	05 = 5V ±10%	[empty] = 200Hz F100 = 100Hz F101 = 101Hz ... F999 = 999Hz	[empty] = 200Hz F100 = 100Hz F101 = 101Hz ... F999 = 999Hz

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

2 Other output functions available, please check availability. Enter CXXXX as long as the new output function is not defined.
3 Models with ERA ‹ 40° available on request
4 Voltages up to 25V possible on request.
5 Leave empty if not applicable. Default frequency is 200 Hz

OUTPUT FUNCTIONS



ERA	Mechanical Rotational Angle		
270 →	45°	180°	315°
180 →	90°	180°	270°
120 →	120°	180°	240°
090 →	135°	180°	225°
040 →	160°	180°	200°

	ERA	Standard	Inverted	Redundant
	360°	C0000	C0001	C0002
	270°	C0208	C0158	C0031
	180°	C0007	C0072	C0036
	120°	C0024	On request	C0032
	90°	C0011		C0025
	70°	C0150		C0149
	60°	C0006		C0020
	40°	C0026		C0123

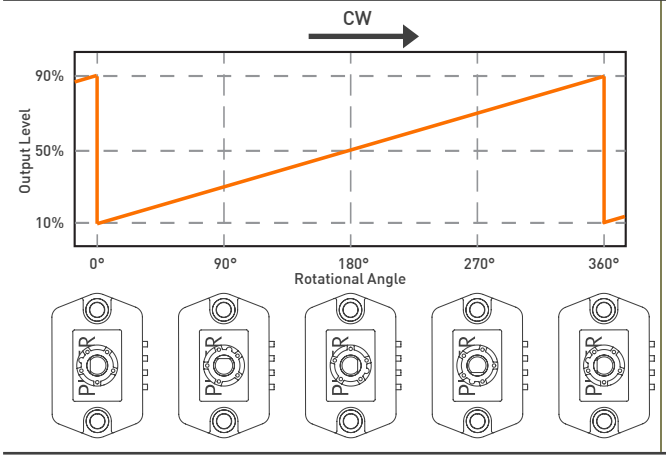
Custom output functions on request.

PS2P-CON

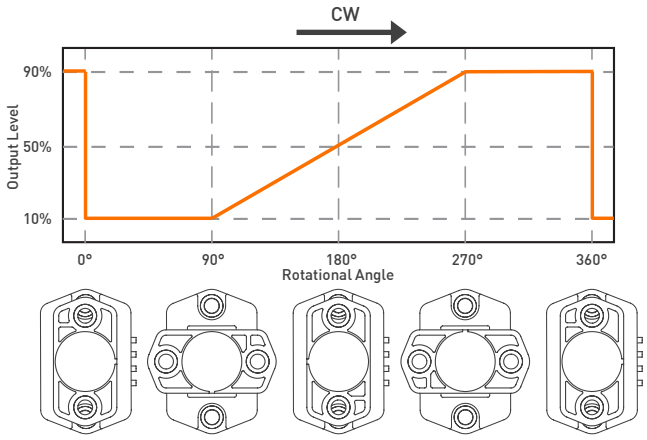
Touchless Concentric Rotary Hall-Effect Position Sensor

OUTPUT VOLTAGE DEPENDING ON MAGNET POSITION

PS2P-CON-CE-M006-1A0-C0000-ERA360-05



PS2P-CON-CE-M001-1A0-C0007-ERA180-05



Custom output functions with up to 4 programmable points on request.

CONNECTION SCHEME

Color	Simple		Redundant		Full-redundant	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.

OUR ADVANTAGE

- Leading-edge innovative position sensing solutions
  - Contactless (Hall-effect and Inductive Technology)
  - Contacting (Potentiometers, Printed Electronics)
- Engineering design-in support
- All our products can be customized to fit target application and customer requirement
- Capability to move seamlessly from development to true high-volume production
- A global footprint with global engineering and commercial support
- One-stop shop not limited to position sensors (temperature, pressure, gas,...) through group collaboration
- Flexibility and entrepreneurship of a medium-sized company with the backing of Amphenol Corporation

Please always use the latest updated datasheets and 3D models published on our website.

CONTACT

Piher Sensing Systems
Polígono Industrial Municipal
Vial T2, Nº22
31500 Tudela
Spain

sales@piher.net

Europe: +34 948 820 450
Americas: +1 636 251 0855
Asia Pacific: +65 9641 8886
India: +91 9538 686 586