

PS2P-LIN

Touchless Hall-Effect Linear Position Sensor



KEY FEATURES



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.



Unlimited mechanical life

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



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 constraint applications.



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.



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-LIN linear 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 moving object. 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-LIN measures changes in linear position relative to the sensor by detecting the movement of a 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 rotary (PS2P-CON) and variable airgap 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

- ▶ Transmission systems
- ▶ Gear shift position
- ▶ Park lock sensor

Home & Building Automation

- ▶ HVAC damper actuator monitoring

Marine

- ▶ Trim / tilt position

Industrial

- ▶ Machinery
- ▶ Monitoring of hydraulic valves and controls
- ▶ IoT modules

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MECHANICAL SPECIFICATIONS

Life	Virtually unlimited
Nominal air gap	3mm between plastic parts
Maximum air gap	5mm, higher on request
Maximum allowed lateral offset	±1mm

ELECTRICAL SPECIFICATIONS

Linearity ¹	±1% absolute (±0.5% upon request)	
Measurement range	12mm, higher on request	
Output protocol	Analog (Ratiometric), PWM Serial Protocol (SPI) upon request	
Output	Simple Redundant Full-redundant	
Switch	On request	
Resolution	Analog, PWM SPI	Up to 12 bit Up to 14 bit
Supply voltage ²	5V ±10% 7V to 25V	
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 Others specifications available

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

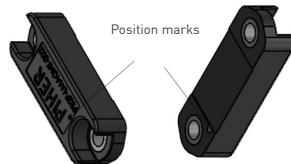
Characteristic	Standard	Level
Radiated emissions	CISPR 16-2-3 class B	30 MHz to 230 MHz, max. 30dB (µV/m) 230 MHz to 1000 MHz, max. 37dB (µV/m)
ESD on housing and connections	EN 61000-4-2:2009	±4 kV contact ±8 kV air
Burst (on supply lines / signal lines)	EN 61000-4-4:2012	±1kV
Surge (on supply lines / 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

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DIMENSIONS (MM)

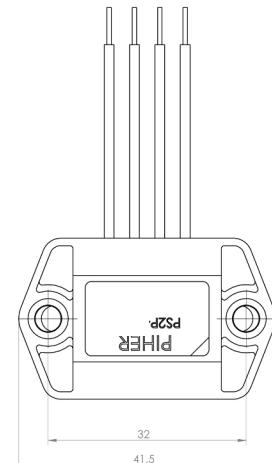
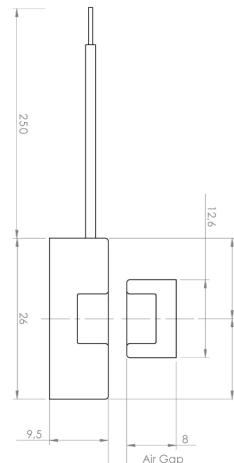
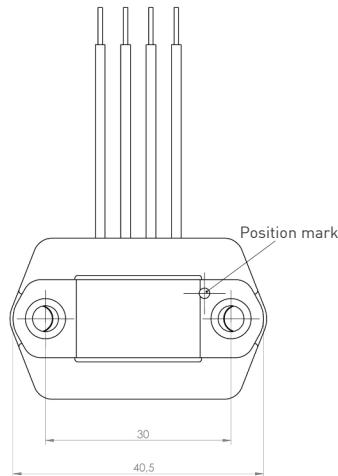
PS2P-LIN-CE (magnet positioned on top)



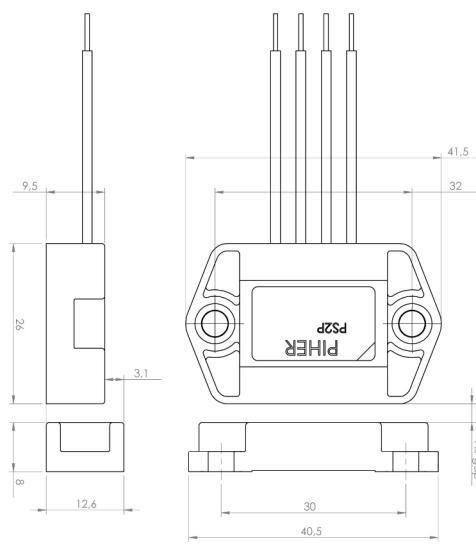
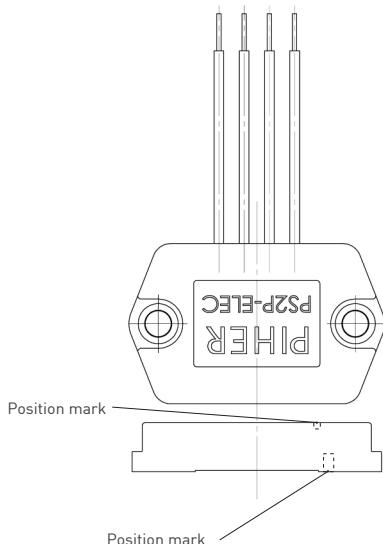
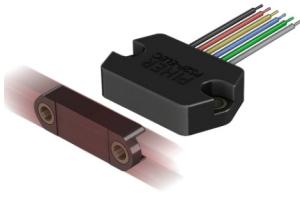
Instructions
of use available at
[www.piher.net](http://piher.net)



Download the STEP file here:
<https://piher.net/piher/?p=935>



PS2P-LIN-LA (magnet positioned laterally)



Magnet shown on 50% position. Nominal air gap: 3mm, higher on request.

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

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HOW TO ORDER (Example: PS2P-LIN-CE-M002-1A0-L0000-ELS120-05)

Simple Output

PS2P-LIN	—	—	M002	—	1	—	L	—	ELS	—	—	—
Series	Magnet position	Magnet model	Type	Output ¹	Output function ²	Electric linear stroke ³	Voltage supply	PWM Frequency Hz ⁴				

CE = lateral
LA = lateral

M002

1 = simple

A0 = analogic
P0 = PWM

L0000
L0001

ELS010
ELS011
...
ELS120

05 = 5V ±10%
RE = 7V-25V

[empty] = 200Hz
F100 = 100Hz
F101 = 101Hz
...
F999 = 999Hz

Redundant output

PS2P-LIN	—	—	M002	—	2	—	L	—	ELS	—	—	—
Series	Magnet position	Magnet model	Type	Output ¹	Output function ²	Electric linear stroke ³	Voltage supply	PWM Frequency Hz [1] ⁴	PWM Frequency Hz [2] ⁴			

CE = lateral
LA = lateral

M002

2 = redundant

AA = analogic
PP = PWM

L0002
L0003

ELS010
ELS011
...
ELS120

05 = 5V ±10%
RE = 7V-25V

[empty] = 200Hz
F100 = 100Hz
F101 = 101Hz
...
F999 = 999Hz

[empty] = 200Hz
F100 = 100Hz
F101 = 101Hz
...
F999 = 999Hz

Full-redundant output

PS2P-LIN	—	—	M002	—	3	—	L	—	ELS	—	05	—
Series	Magnet position	Magnet model	Type	Output ¹	Output function ²	Electric linear stroke ³	Voltage supply	PWM Frequency Hz [1] ⁴	PWM Frequency Hz [2] ⁴			

CE = lateral
LA = lateral

M002

3 = full-redundant

AA = analogic
PP = PWM

L0002
L0003

ELS010
ELS011
...
ELS120

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.

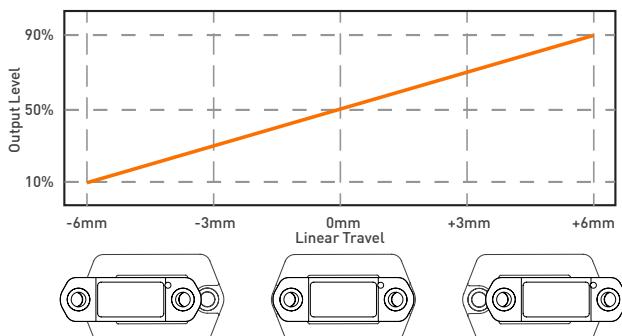
2 Other output functions available, please check availability. Enter LXXXX as long as the new output function is not defined.

3 ELS is measured in steps of 0.1mm, ELS010 = 1mm effective electrical stroke, ELS120 = 12mm effective electrical stroke. Larger strokes available on request.

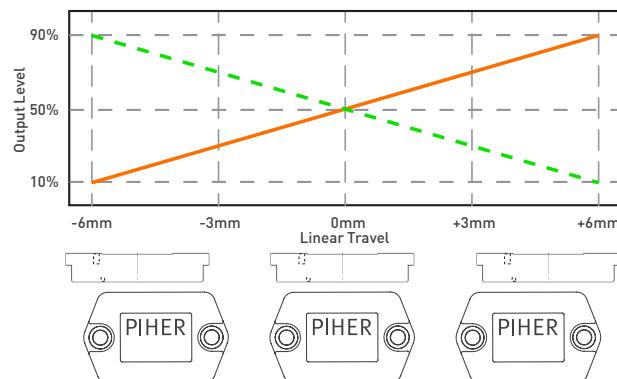
4 Leave empty if not applicable. Default frequency is 200 Hz

OUTPUT VOLTAGE DEPENDING ON MAGNET POSITION

PS2P-LIN-CE-M002-1A0-L0000-ELS120-05



PS2P-LIN-LA-M002-2AA-L0002-ELS120-05



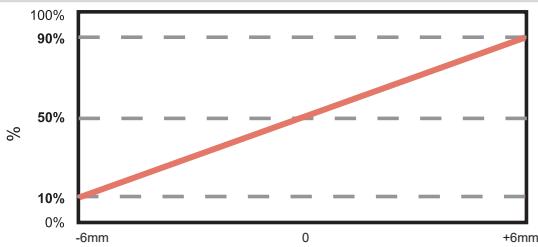
Custom output functions with up to 4 programmable points on request.

PS2P-LIN

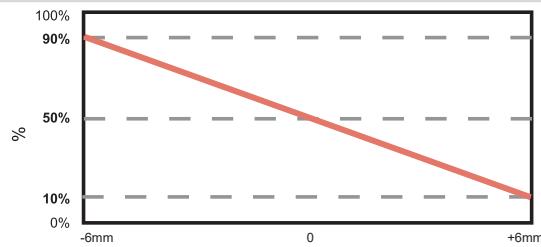
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EXAMPLE OUTPUT FUNCTIONS

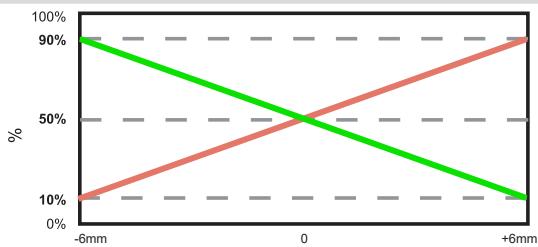
L0000 (simple)



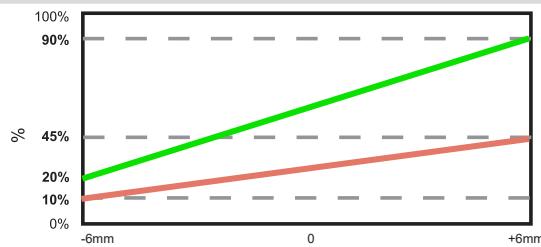
L0001 (simple)



L0002 (redundant)



L0003 (redundant)



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.

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