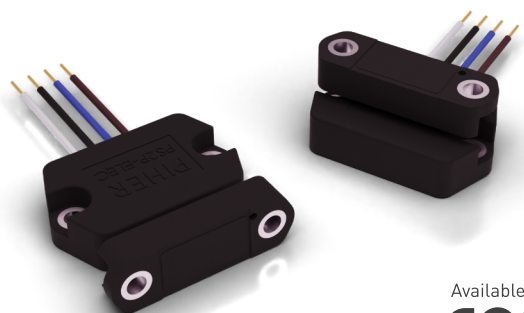


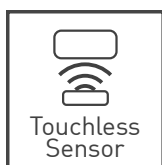
# PS2P-LIN

## Touchless Hall-Effect Linear Position Sensor



Available with  
**CAN**

### KEY FEATURES



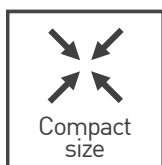
#### True touchless operation

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 an 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.



#### Configurable measurement range

Accurate linear displacement feedback of up to 25mm. Other/higher ranges are available upon request.

### DESCRIPTION

Piher Sensing Systems' PS2P-LIN compact 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 coplanar 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

# PS2P-LIN

## Touchless Hall-Effect Linear Position Sensor

### MECHANICAL SPECIFICATIONS

|                                |                     |
|--------------------------------|---------------------|
| Life                           | Virtually unlimited |
| Nominal air gap                | 3mm                 |
| Maximum air gap <sup>1</sup>   | 5mm                 |
| Maximum allowed lateral offset | ±1mm                |

<sup>1</sup> For higher air gap please contact Piher Sensing Systems.

### ELECTRICAL SPECIFICATIONS

|                                |  |
|--------------------------------|--|
| Linearity <sup>1</sup>         | ±1% absolute (±0.5% upon request)  |
| Measurement range <sup>2</sup> | 0 mm to 12 mm<br>0 mm to 25 mm   |
| Output protocol                | Analog (Ratiometric), CAN, PWM<br>Serial Protocol (SPI) upon request                       |
| Output                         | Simple<br>Redundant<br>Full-redundant  |
| Switch                         | On request   |
| Resolution                     | Analog, CAN, PWM<br>SPI<br>Up to 12 bit<br>Up to 14 bit                                    |
| Supply voltage <sup>3</sup>    | Analog and PWM<br>CAN<br>5V ±10%<br>7V to 15V<br>7V to 32V                                 |
| Supply current                 | Single version<br>Redundant version<br>CAN version<br>Typ 8.5 mA<br>Typ 17 mA<br>Typ 47 mA |
| Voltage protection             | ±10V   |
| Self-diagnostic features       | Yes  |

<sup>1</sup> Ferromagnetic materials close to the sensor (i.e. mounting surface) may affect the sensor's linearity.

<sup>2</sup> For other/higher linear range please contact Piher Sensing Systems.

<sup>3</sup> Voltages up to 25 V possible on request.

### ENVIRONMENTAL SPECIFICATIONS

|  |   |
|--|---|
| Operating and storage temperature <sup>1</sup> | -40° to +125°C                                |
| Shock  | 50g   |
| Vibration                                      | 5Hz to 2000 Hz; 20g; A <sub>max</sub> 0,75 mm |
| Sealing <sup>2</sup>                           | IP67, IP69K                                   |
| Approval                                       | CE <sup>2</sup>                               |

<sup>1</sup> Other specifications available

<sup>2</sup> CE-approval applies to analogic models.

### EMI/EMC Testing

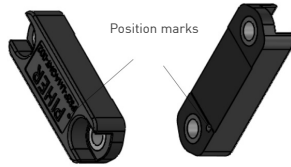
| Characteristic                         | Standard             | Level  |
|--|----------------------|--|
| Radiated emissions                     | CISPR 16-2-3 class B | 30 MHz to 230 MHz, max. 30dB (µV/m)<br>230 MHz to 1000 MHz, max. 37dB (µV/m) |
| ESD on housing and connections         | EN 61000-4-2:2009    | ±4 kV contact<br>±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-LIN

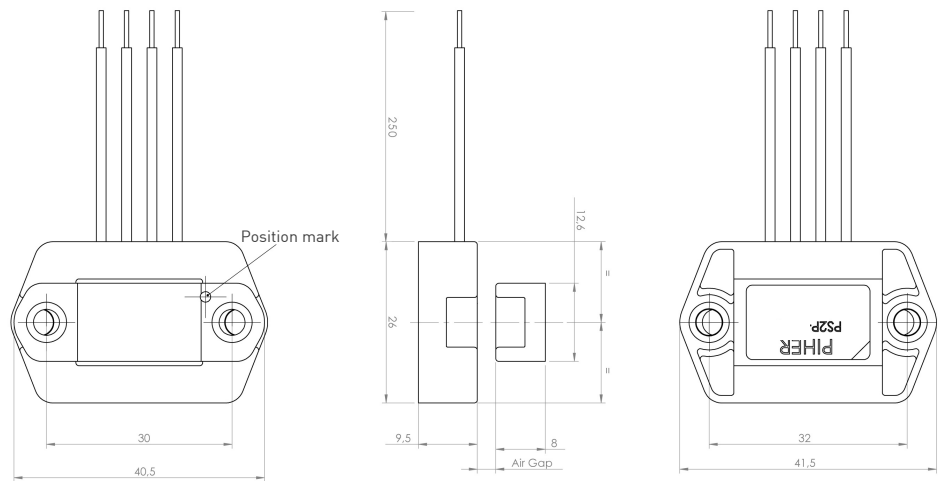
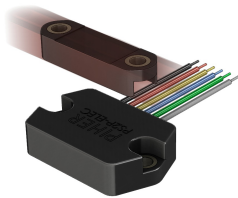
## Touchless Hall-Effect Linear Position Sensor

### DIMENSIONS (MM)

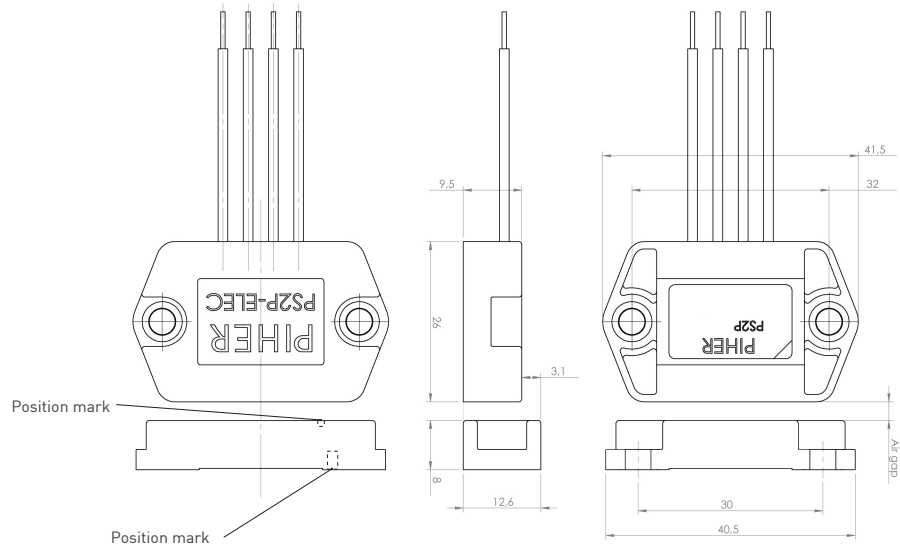
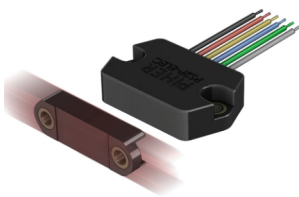
#### PS2P-LIN-CE (magnet positioned on top)



Download the STEP file here:  
[www.pihher.net](http://www.pihher.net)



#### 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.

# PS2P-LIN

## Touchless Hall-Effect Linear Position Sensor

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 <sup>1</sup>  | Output function <sup>2</sup>     | Electric linear stroke <sup>3</sup>               | Voltage supply <sup>4</sup>                        | PWM Frequency Hz <sup>5</sup>  |        |   |         |   |    |   |       |
|          | CE = on top<br>LA = lateral | M002         | 1 = simple | A0 = analogic<br>P0 = PWM<br>J0 = CAN SAE J1939<br>O0 = CAN OPEN | L0000<br>L0001<br>L0021<br>L0025 | ELS120 = 12mm<br>ELS250 = 25mm<br>ELSXYZ = XY,Zmm | O5 = 5V ±10%<br>RE = 7V-15V [A&PWM] / 7V-32V (CAN) | [empty] = 200Hz<br>F100 = 100Hz<br>F101 = 101Hz<br>...<br>F999 = 999Hz |        |   |         |   |    |   |       |

### Redundant output

| PS2P-LIN | -                           | __           | -             | M002                      | -                            | 2   |                             | -  | L_____   | - | ELS____ | - | __ | - | _____ |
|----------|-----------------------------|--------------|---------------|---------------------------|------------------------------|---|-----------------------------|--|--|---|---------|---|----|---|-------|
| Series   | Magnet position             | Magnet model | Type          | Output <sup>1</sup>       | Output function <sup>2</sup> | Electric linear stroke <sup>3</sup>               | Voltage supply <sup>4</sup> | PWM Frequency Hz (1) <sup>5</sup>                                      | PWM Frequency Hz (2) <sup>5</sup>                                      |   |         |   |    |   |       |
|          | CE = on top<br>LA = lateral | M002         | 2 = redundant | AA = analogic<br>PP = PWM | L0002<br>L0016               | ELS120 = 12mm<br>ELS250 = 25mm<br>ELSXYZ = XY,Zmm | O5 = 5V ±10%<br>RE = 7V-15V | [empty] = 200Hz<br>F100 = 100Hz<br>F101 = 101Hz<br>...<br>F999 = 999Hz | [empty] = 200Hz<br>F100 = 100Hz<br>F101 = 101Hz<br>...<br>F999 = 999Hz |   |         |   |    |   |       |

### Full-redundant output

| PS2P-LIN | -                           | __           | -                  | M002                      | -                            | 3   |                | -  | L_____   | - | ELS____ | - | 05 | - | _____ |
|----------|-----------------------------|--------------|--------------------|---------------------------|------------------------------|---|----------------|--|--|---|---------|---|----|---|-------|
| Series   | Magnet position             | Magnet model | Type               | Output <sup>1</sup>       | Output function <sup>2</sup> | Electric linear stroke <sup>3</sup>               | Voltage supply | PWM Frequency Hz (1) <sup>5</sup>                                      | PWM Frequency Hz (2) <sup>5</sup>                                      |   |         |   |    |   |       |
|          | CE = on top<br>LA = lateral | M002         | 3 = full-redundant | AA = analogic<br>PP = PWM | L0002<br>L0016               | ELS120 = 12mm<br>ELS250 = 25mm<br>ELSXYZ = XY,Zmm | O5 = 5V ±10%   | [empty] = 200Hz<br>F100 = 100Hz<br>F101 = 101Hz<br>...<br>F999 = 999Hz | [empty] = 200Hz<br>F100 = 100Hz<br>F101 = 101Hz<br>...<br>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.

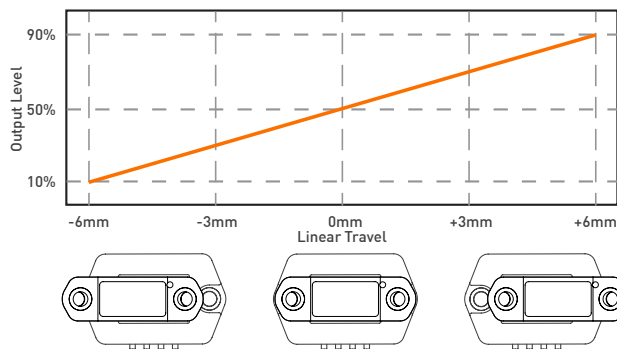
3 ELS is measured in steps of 0.1mm, min. ELS050 = 5mm effective electrical stroke, max. ELS250 = 25mm effective electrical stroke. Larger strokes available on request.

4 Voltages up to 25V possible on request.

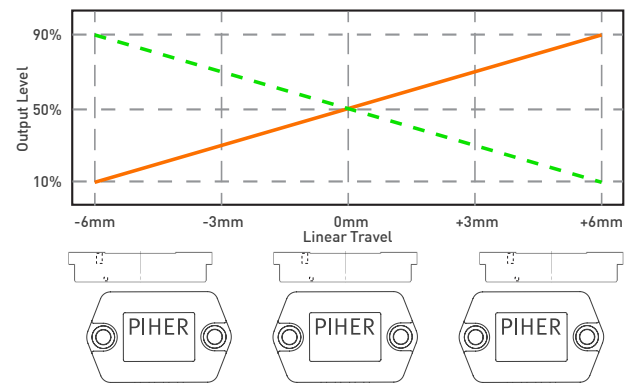
5 Leave empty if not applicable. Default frequency is 200 Hz

### OUTPUT VOLTAGE DEPENDING ON MAGNET POSITION

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



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

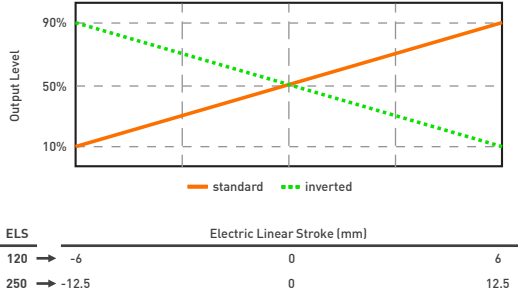


Custom output functions with up to 4 programmable points on request.

# PS2P-LIN

## Touchless Hall-Effect Linear Position Sensor

### OUTPUT FUNCTIONS



|  | ELS | Standard | Inverted | Redundant |
|--|-----|----------|----------|-----------|
|  | 120 | L0000    | L0001    | L0002     |
|  | 250 | L0021    | L0025    | L0016     |

Custom output functions 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](http://www.piher.net). Connector assembly available on request.



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

#### Disclaimer:

The product information in this catalog is for reference purposes. Please consult for the most up to date and accurate design information. Piher Sensors & Controls S.A., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Piher"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product described herein. Piher disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Piher's terms and conditions of sale, including but not limited to the warranty expressed therein, which apply to these products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Piher. The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Piher products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Piher for any damages arising or resulting from such use or sale. Please contact authorized Piher personnel to obtain written terms and conditions regarding products designed for such applications. Product names and markings noted herein may be trademarks of their respective owners. Information contained in and/or attached to this catalog may be subject to export control regulations of the European Community, USA, or other countries. Each recipient of this document is responsible to ensure that usage and/or transfer of any information contained in this document complies with all relevant export control regulations. If you are in any doubt about the export control restrictions that apply to this information, please contact the sender immediately. For any Piher Exports, Note: All products / technologies are EAR99 Classified commodities. Exports from the United States are in accordance with the Export Administration Regulations. Diversion contrary to US law is prohibited.

### CONTACT

**Piher Sensing Systems**  
 Polígono Industrial Municipal  
 Vial T2, N°22  
 31500 Tudela  
 Spain

[sales@piher.net](mailto:sales@piher.net)

Europe: +34 948 820 450  
 Americas: +1 636 251 0855  
 Asia Pacific: +65 9641 8886

Rev:14032023 © 2023 Piher Sensors & Controls S.A.