

# Micro Power Inductive Proximity Sensor **LPS Series**

## 4 $\mu\text{A}$ Operating Current +2.5V DC Industry's Lowest

### Description:

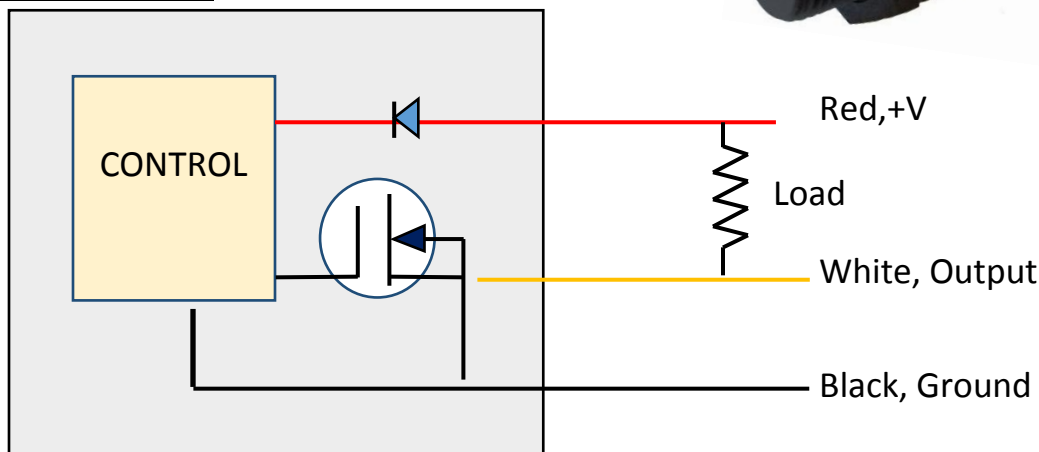
LPS(Inductive Proximity Sensor) series operates at the industry's lowest operating current (4  $\mu\text{A}$ ) level and lowest power supply voltage levels (+2.5V to +27V), making it ideal for portable/battery operated applications. The low minimum operating voltage of +2.5V also makes this sensor directly compatible with most types of computers for portable robotics, motor controls, and automation. Utilizing CMOS IC sensor technology, this sensor provides excellent results, even with difficult-to-detect objects, e.g. small or thin parts, or bright metals. Normally Closed (N.C.) or Normally Open (N.O.) sensor output functions are available utilizing NMOS switching.

### Features:

- Ultra-low power supply current consumption: 4  $\mu\text{A}$  max.
- Low power supply voltage: +2.5V to +27V
- Fast start up time: 20  $\mu\text{sec}$ .
- Fast response time: 200  $\mu\text{sec}$ .



### Wiring Diagram:



### Absolute Maximum Ratings

|   |                        |
|---|------------------------|
| <b>Power Supply Voltage <math>V_{DD}</math></b> | +50 V max. D.C.        |
| <b>Output Voltage</b>                           | 0 V min.; +30 V max.   |
| <b>Output Current</b>                           | 0.5 A max.             |
| <b>Temperature</b>                              | -40°C min.; +85°C max. |

|  |
|--|
| <b>Micro Power Inductive Proximity Sensor <span style="color: red;">LPS Series</span></b><br><b><span style="color: blue;">4 <math>\mu</math>A Operating Current +2.5V DC Industry's Lowest</span></b> |
|--|

**Specifications:** Ta= +25°C unless otherwise specified

| <b>Package / Case</b>                                 | Plastic Cylinder. Threaded. M12.   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
|---|--|--------------------|--------------------|----------|---|--------|------|-------|------|-----------------|------|------|-----|
| <b>Target</b>   | 24 x 24 x 1 mm Aluminum. See correction factor table below for other metals.<br>Ferrous metal: The sensing distance decreases with ferrous or high permittivity metal.   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Correction Factors</b> <small>Note 1</small>       | <table border="1" style="margin: auto;"> <thead> <tr> <th style="width: 50%;">Metal</th> <th style="width: 50%;">Correction Factors</th> </tr> </thead> <tbody> <tr> <td>Aluminum</td> <td>1</td> </tr> <tr> <td>Copper</td> <td>0.89</td> </tr> <tr> <td>Brass</td> <td>0.88</td> </tr> <tr> <td>Stainless steel</td> <td>0.63</td> </tr> <tr> <td>IRON</td> <td>0.7</td> </tr> </tbody> </table> | Metal              | Correction Factors | Aluminum | 1 | Copper | 0.89 | Brass | 0.88 | Stainless steel | 0.63 | IRON | 0.7 |
|   | Metal  | Correction Factors |                    |          |   |        |      |       |      |                 |      |      |     |
|   | Aluminum   | 1                  |                    |          |   |        |      |       |      |                 |      |      |     |
|   | Copper   | 0.89               |                    |          |   |        |      |       |      |                 |      |      |     |
|   | Brass  | 0.88               |                    |          |   |        |      |       |      |                 |      |      |     |
| Stainless steel                                       | 0.63   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| IRON  | 0.7  |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Power supply voltage (Operating Voltage Range)</b> | +2.5 ~ +27 V D.C.  |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Power Supply Current Consumption</b>               | 4 $\mu$ A max.   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Output Types</b> <small>note 2</small>             | N.C. (Normally Closed) or N.O. (Normally Open)   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Shielding</b>                                      | Non-shielded   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Output Voltage</b>                                 | 27V max.   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Output Leakage Current</b>                         | 1 $\mu$ A max.   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Output Load Current</b>                            | 250 mA max.  |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Output Voltage Drop</b>                            | 0.4 V max.   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Sensing Distance</b> <small>note 3</small>         | 4 mm typical   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Response Frequency</b>                             | 5 KHz (200 $\mu$ sec.) typical   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Start-up Time</b>                                  | 20 $\mu$ sec. typical  |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Hysteresis</b>                                     | None   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Protection Circuit</b>                             | Power source circuit reverse polarity protection   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Ambient Humidity</b>                               | Operating: 35% to 95%, Storage: 35% to 95%   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Temperature Influence</b>                          | $\pm$ 5% typical over -25°C to +70°C<br>Referenced to sensing distance at +23°C  |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Supply Voltage Influence</b>                       | $\pm$ 1% max. of sensing distance in rated voltage range   |                    |                    |          |   |        |      |       |      |                 |      |      |     |
| <b>Operating Temperature Range</b>                    | -25°C to +70°C   |                    |                    |          |   |        |      |       |      |                 |      |      |     |

**Micro Power Inductive Proximity Sensor LPS Series**  
**4  $\mu$ A Operating Current +2.5V DC Industry's Lowest**

|                                  |  |
|----------------------------------|--|
| <b>Storage Temperature Range</b> | -40°C to 85°C (with no icing or condensation)  |
| <b>Ingress Protection</b>        | IP65   |
| <b>Termination Style</b>         | Pre-wired. 2 m cable leads. 3 conductors. 26 AWG. Conductor strand: 7/34.                                    |
| <b>Indicator</b>                 | No indicator   |
| <b>Material</b>                  | Case: PPS. Flammability : UL94-V0<br>Clamping nuts: PPS. Flammability : UL94-V0<br>Cable: PVC. UL Style 2464 |

**Note 1 Correction Factors** -A percentage of the rated operating distance (AI) that represents the operating distance for targets constructed from materials other than Aluminum. Deviations maybe due to variations in the oscillator frequency, alloy compositions, purity & target geometry.

**Note 2 Normally Closed (N.C.):** The output is **OFF** when the target is detected by the sensor.  
**Normally Open (N.O.):** The output is **ON** when the target is detected by the sensor.

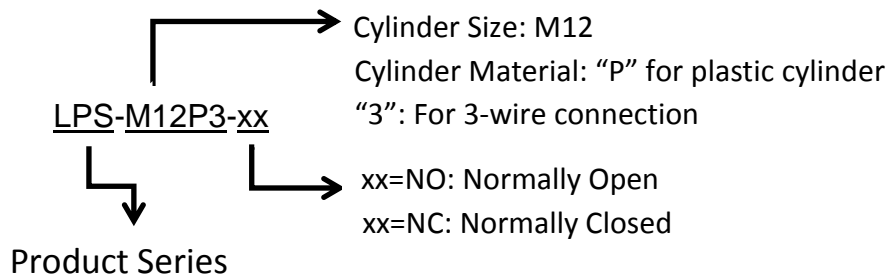
**Note 3 Sensing Distance:** A distance at which the target approaching the sensing face, along the reference axis, causes the output signal to change.

**How to Order**

**Part Number examples:**

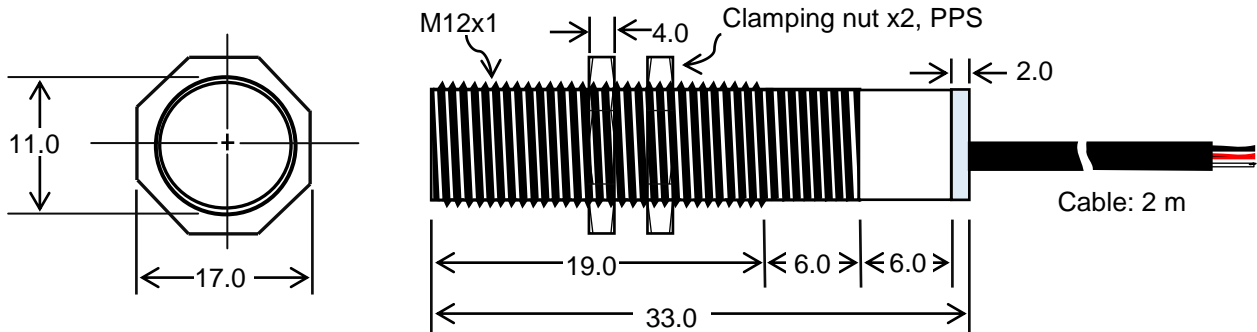
Normally Open:LPS-M12P3-NO

Normally Closed:LPS-M12P3-NC



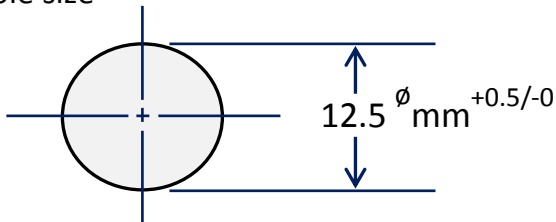
**Micro Power Inductive Proximity Sensor LPS Series**  
**4  $\mu$ A Operating Current +2.5V DC Industry's Lowest**

**Outline Dimensions (mm)**

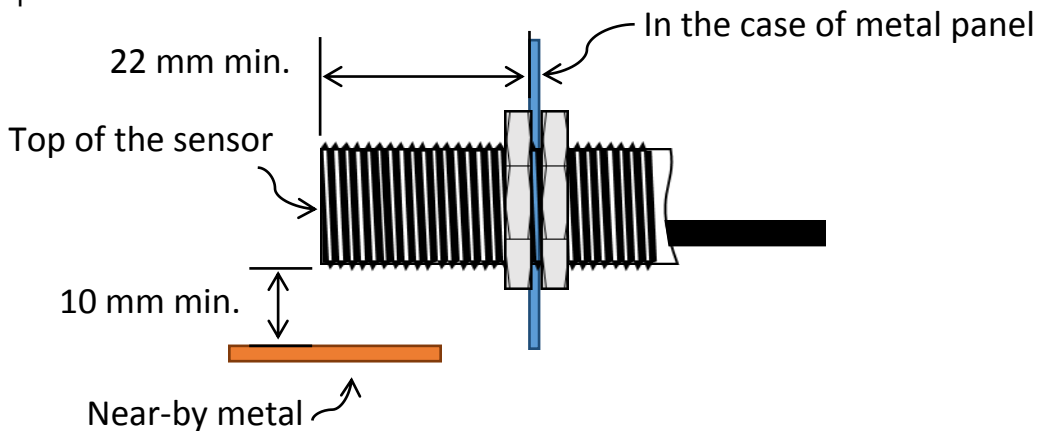


**Sensor Mounting and Surrounding Metal Influence**

Cut-out hole size



To minimize the surrounding metal interference, the following 22 mm and 10 mm minimum clearance requirement must be followed.



**Warranty**

Micro Oscillator Inc. does not assume any liability arising out of the application or use of any product or circuit described herein. Our products are not authorized for use as components in devices used for life support or other critical application where failure can cause death or bodily injury. In the case of this product being defective in manufacturing, labeling, packaging or shipping, it will be replaced with a satisfactory unit or the purchase price refunded. This is the exclusive remedy, even if the defect or damage is caused by negligence or other fault.

PATENT PENDING