LP series Programmable Incremental Encoder Cable or M12 connection

- Low profile package saves space
- Excellent resistance to shock and vibration
- 30mm standard through shaft, PEEK reduction hub available
- High protection level of IP66
- High performance in temperatures from –40°C to +100°C
- HTL or TTL electronic
- Programmable resolutions from 1 to 10000 PPR
- M12 or cable output (also available with terminal box connection)

Certifications:
The LP Incremental Encoder is available with the following certifications

<table>
<thead>
<tr>
<th>Material</th>
<th>Cover : anodised aluminum</th>
<th>Vibrations [EN60068-2-6] ≤ 200m.s⁻² (55 … 2 000 Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Body : anodised aluminum</td>
<td>Shaft inertia</td>
</tr>
<tr>
<td></td>
<td>Shaft : AISI 303 stainless steel</td>
<td>&lt; 84000 g.mm²</td>
</tr>
<tr>
<td>Ball bearings</td>
<td>6807 – Sealed</td>
<td>Static/Dynamic torque</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 / 300 mN.m</td>
</tr>
<tr>
<td>Maximum loads</td>
<td>Axial: 40 N</td>
<td>Continuous max. speed*</td>
</tr>
<tr>
<td></td>
<td>Radial: 80 N</td>
<td>6000 min⁻¹</td>
</tr>
<tr>
<td>Shocks [EN60068-2-27]</td>
<td>≤ 3000m.s⁻² (during 5 ms)</td>
<td>Theoretical mechanical lifetime L₁₀h*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 18.10⁰ turns / 100000 hours</td>
</tr>
</tbody>
</table>

Available mechanics – shaft options:

- HHU9: Through Hollow Shaft
- HHK9: Blind Hollow Shaft
- HHA9: Shaft with Integrated coupling
- HHM9: Solid Shaft

Output Waveform:
Waveform AA/ BB/ 00/ Channel B before A Clockwise

Index calibration gated A & B (code 9)

Index calibration gated B (code V/US)

Changes possible without further notice - Version 13.1.207

* please reference the user manual heat derating curves

** continuous max. speed – ½ max. load – ISO 281, L₁₀
**LP series**

Programmable Incremental Encoder

Floating Mountings  
Cable or M12 connection

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**Dimensions**

**HHU9** – Through hollow shaft – with cable output

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**Note:**

CHc : Hexagonal Socket head cap screws  
HC : Hexagonal socket set screws

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**Dimensions**

**HHU9** – Through hollow shaft – with M12 output and anti-rotation 9445/053

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**Dimensions**

**HHK9** – Blind hollow shaft – with cable output

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Changes possible without further notice - Version 151207
**Dimensions**

HHA9 – Shaft with integrated coupling – with M12 connection

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**Dimensions**

HHM9 – Solid shaft – with cable output
**Programmable Incremental Encoder**

**Cable or M12 connection**

### Electrical Characteristics:

<table>
<thead>
<tr>
<th>Version</th>
<th>Output signals</th>
<th>Resolution</th>
<th>Operating Voltage VCI</th>
<th>Supply current (no loads)</th>
<th>Current per channel pair</th>
<th>Output Levels (I=20mA)</th>
<th>Frequency capability</th>
<th>Short circuits proof</th>
<th>Reverse polarity tolerant</th>
<th>Temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPS</td>
<td>HTL</td>
<td>1 to 10000</td>
<td>5-30V ±± 250mA</td>
<td>75mA</td>
<td>40mA</td>
<td>Low max: 0.5V</td>
<td>Up to 1MHz</td>
<td>Yes</td>
<td>Yes</td>
<td>-40°C +100°C</td>
</tr>
<tr>
<td>RP2</td>
<td>TTL R5422</td>
<td></td>
<td>4.75-30V ±± 250mA</td>
<td>75mA</td>
<td>40mA</td>
<td>Low max: 0.5V</td>
<td>Up to 1MHz</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

(*) UL listed: -20°C +80°C. Device must be supplied by a Class 2, LPS or SELV limited energy source.

### Connection:

<table>
<thead>
<tr>
<th>GM</th>
<th>M12 - 8 pins</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>Ground</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PVC cable 8 wires</td>
<td>WH</td>
<td>white</td>
<td>BN</td>
<td>brown</td>
<td>GN</td>
<td>green</td>
<td>YE</td>
<td>yellow</td>
<td>GY</td>
</tr>
<tr>
<td>G3</td>
<td>PUR cable 8 wires</td>
<td>BK</td>
<td>black</td>
<td>RD</td>
<td>red</td>
<td>GN</td>
<td>green</td>
<td>BN</td>
<td>brown</td>
<td>VT</td>
</tr>
<tr>
<td>GC</td>
<td>PUR cable 12 wires (not UL)</td>
<td>WH</td>
<td>white + WH/GN white / green</td>
<td>BU</td>
<td>blue + BN/GN brown / green</td>
<td>GN</td>
<td>green</td>
<td>YE</td>
<td>yellow</td>
<td>GY</td>
</tr>
<tr>
<td>TP</td>
<td>Silicon cable (7) 8 wires (not UL)</td>
<td>WH</td>
<td>white</td>
<td>BN</td>
<td>brown</td>
<td>GN</td>
<td>green</td>
<td>YE</td>
<td>yellow</td>
<td>GY</td>
</tr>
</tbody>
</table>

[1] Advised cable for mobile application, in extreme temperature from -40°C to +100°C

### Programmable possibility:

The programmable LP incremental encoder features a patented dynamic encoder resolution capability that allows users to easily program the encoder resolution to any value between 1 and 10000 counts per turn. The LP allows for virtually unlimited resolution variations. Index calibration and index position can also be programmed.

Using the simple programming interface software and USB interface cable, users can program the encoder resolution on site as needed. In the software, type the encoder resolution and click 'Program'. A new resolution is now programmed. It's that easy!

With the LP, resolution can be programmed and reprogrammed at any time by the user.

For users with multiple requirements, LP can be kept in stock and programmed as needed.

LP programming cable has to be ordered separately: consult us.

### LP Incremental Ordering Options

Use this diagram, working from left to right to construct your model number (Example: HHA9 E6/PP5X/XPROG/GMR/U6)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>HH9 = hollow shaft</td>
<td>E5 = 5/8’’ E6 = 3/4’’ E8 = 1’’ E30 = 30mm</td>
<td>PPS = 5-30V voltage and push-pull output</td>
<td>X = Programmable channels</td>
<td>XPROG = Programmable resolution</td>
<td>G3R = PVC cable GCR = PUR cable GPR = PUR cable (not UL) TER = Silicone cable (not UL)</td>
<td>xxx = cable length ex. 020 = 2meters</td>
<td>U3 = With insulated sleeve</td>
<td>US = Blind sleeve U6 = Through sleeve</td>
</tr>
<tr>
<td>HH9 = blind shaft</td>
<td>E6 = 3/4’’ 14 = 14mm 20 = 20mm</td>
<td>RP2 = 4.75-30V voltage and R5422 output</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HH9 = hollow shaft with integrated coupling</td>
<td>E6 = 3/4’’ 14 = 14mm 20 = 20mm</td>
<td></td>
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</tr>
<tr>
<td>HH9 = solid shaft</td>
<td>E3 = 3/8’’ 12 = 12mm</td>
<td></td>
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</tbody>
</table>

Stainless steel option available. Anti-rotation accessory: M9445/053 to be ordered separately.