Low profile package saves space
- Designed for use in hazardous areas
- Excellent resistance to shock and vibration
- 30mm standard through shaft, PEEK reduction hub available
- Hard anodized housing and high protection level of IP66
- High performance in temperatures from -40°C to +85°C
- Reinforced SSI output
- Wiring fault tolerant & 60Vdc overvoltage protection
- Resolution up to 16 bits

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

Mechanical Characteristics:

<table>
<thead>
<tr>
<th>Material</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover</td>
<td>Hard anodized aluminum</td>
</tr>
<tr>
<td>Body</td>
<td>Hard anodized aluminum</td>
</tr>
<tr>
<td>Shaft</td>
<td>AISI 303 stainless steel</td>
</tr>
<tr>
<td>Ball bearings</td>
<td>6807 - Sealed</td>
</tr>
<tr>
<td>Maximum loads</td>
<td>Axial: 40 N</td>
</tr>
<tr>
<td></td>
<td>Radial: 80 N</td>
</tr>
<tr>
<td>Shocks (EN60068-2-27)</td>
<td>≤ 3000m.s² (during 5 ms)</td>
</tr>
</tbody>
</table>

*The temperature given on the following chart has to be added to the ambient temperature. The total must never exceed the maximum °C given by the datasheet. These temperature elevations are typical values which should be considered as indications only.

Available mechanics - shaft options:

AHAX: Shaft with integrated coupling
AHUX: Through Hollow Shaft
AHKX: Blind Hollow Shaft
AHMX: Solid Shaft

Serial Synchronous Interface SSI output provides effective synchronisation in a closed-loop control system. A clock pulse train from a controller is used to shift out sensor data: one bit of position data is transmitted to the controller per clock pulse received by the sensor.
Floating Mountings

Ball end tether arm:
P/N : M9230-03/xxx
xxx = length in mm

Ball end tether arm

M6 Ground Screw:
CHc M4 screw (cw3)

Specifications:

**Dimensions**

AHUX – Through hollow shaft

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>52.5</td>
</tr>
<tr>
<td>1</td>
<td>51.5</td>
</tr>
<tr>
<td>2</td>
<td>2.029</td>
</tr>
<tr>
<td>3</td>
<td>0.118</td>
</tr>
<tr>
<td>4</td>
<td>0.039</td>
</tr>
</tbody>
</table>

Note:

CHc : Hexagonal socket head cap screws (recommended torque clamp screw CHc M4 = 3.5 N.m, and Terminal Box CHc M6 = 6.5 N.m)
HC : Hexagonal socket set screws (recommended torque HC M6 = 2.5 N.m)

**Dimensions**

AHKX – Blind hollow shaft

Note:

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

**Specifications**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>97</td>
</tr>
<tr>
<td>B</td>
<td>82</td>
</tr>
<tr>
<td>C</td>
<td>37.50</td>
</tr>
<tr>
<td>D</td>
<td>18.25</td>
</tr>
<tr>
<td>E</td>
<td>27</td>
</tr>
<tr>
<td>ØG (Cable gland)</td>
<td>31</td>
</tr>
<tr>
<td>Cable Ø</td>
<td>9 to 16</td>
</tr>
</tbody>
</table>

Specifications sheet: AH_X - P/N 2000/009 Rev. A
Dimensions
AHAX - Shaft with integrated coupling

Dimensions
AHMX - Solid shaft

Flange Mountings

UL - ATEX - IECEx certified
Electrical Characteristics:

<table>
<thead>
<tr>
<th>Version</th>
<th>Output signals</th>
<th>Resolution</th>
<th>Operating Voltage Vcl</th>
<th>Supply current (no loads)</th>
<th>Current per channel pair</th>
<th>Max Frequency capability</th>
<th>Encoder accuracy</th>
<th>Short circuits proof</th>
<th>Reverse polarity tolerant</th>
<th>Wiring fault tolerant &amp; 60Vdc overvoltage protection</th>
<th>Temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSR</td>
<td>RS422</td>
<td>up to 16 BITS</td>
<td>5-30V</td>
<td>75mA</td>
<td>40mA</td>
<td>1MHz</td>
<td>+/-0.1°</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>-40°C +85°C</td>
</tr>
<tr>
<td>PSS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Terminal Box Connection:

- + Clk+ Clk- Data+ Data- RAZ NC Ground
1 2 3 4 5 6 7 8 9

Available Terminal Box versions:
- E0R: M16 without cable-gland
- E4R: 1/2'' NPT without cable-gland
- E6R: 3/4'' NPT without cable-gland

Available resolution:
Standard: 12 and 13 bits
For non-standard resolutions up to 16 bits, please contact factory

LP Absolute Ordering Options

Use this diagram, working from left to right to construct your model number (Example: AHAX_E6//PSRG//13//E5R//U6

AH _ _ _ _ _ _ _ _ _ 

AHX = hollow shaft
AHIX = blind shaft
AHAX = hollow shaft with integrated coupling
AHMX = solid shaft

PSR = 5-30V voltage and reinforced SSI output (without parity)
PSS = 5-30V voltage and SSI output (without parity)
B = Binary (CCW increasing code)
G = Gray (CCW increasing code)

(Enter bits) See available resolutions above

SKR = M16 cable-gland with PUR cable
Blank = No cable

xx = cable length
ex 020 = 2meters

U3 = With insulated sleeve
U5 = Blind sleeve
U6 = Through sleeve
** = no sleeve

Stainless steel option available.

Anti-rotation accessory: M9230-03/xxx Ball end tether arm (xxx = length in mm) to be ordered separately.
SPECIAL CONDITIONS FOR SAFE USE:

None required.
The gaps of the different flame paths are less than the values specified in the tables of the IEC 60079-1 standard.
The width of the different flameproof joints are superior to these specified in tables of IEC 60079-1 standard.
See Document 08329-001 for construction details.

ASSEMBLY CAUTION/WARNING:

Keep terminal cover closed and cable gland secured while in presence of hazardous atmosphere.
Open all circuits to this product prior to removal of terminal block cover.

Electrical installation shall use standard EN/IEC 60079-14 and/or NEC Class 2 circuit specifications. UL certified installations require the use of a sealing fitting certified to 60079-0 Ex d IIB within 18 in. (46 cm) of the encoder. Terminal block covers are marked near the threaded hole with the basic thread size to aid with selection of fittings or glands. Conductor insulation must be rated for at least 105°C ambient temperature. External case ground connection is provided by means of a screw and ring type terminal which accepts up to 10 AWG (5.26 mm²) size conductor.
The customer shall use our products according to our specifications and to the manners of the profession. BEI Sensors will not be responsible for any defect resulting from improper installation or from operating outside of the specification limits of the product. Malfunctions caused by excessive shocks, bad electric supply, under or over voltage, the environmental conditions outside of the design specifications, are not covered by warranty. The encoder doesn’t require any maintenance. There are no user serviceable parts inside. Any defective encoder shall be returned to the nearest BEI Sensors facility for evaluation and repair/replacement. A high integrity case ground connection must be made at or near the encoder installation location.

See LP series User Manual for installation details and Specification Documents (no. 2000/008 or 2000/009) for product details not otherwise indicated on this document.

EU Declaration of Conformity

1. We, BEI Sensors, certify that Models HH_X and AH_X all resolutions, channel and output type options are explosion proof and flame proof as noted on the UL, IECEx and DEMKO certificates cited below.
2. With the following marking: II 2 G Ex d IIB T4 Gb
3. Designed and manufactured to comply with these directives:
   ATEX : 2014/34/EU and CEM : 2014/30/EU
4. Complies with these standards:
   ATEX: EN60079-0:2012+A11:2013, EN60079-1:2014,
   IECEx: IEC60079-0:2011+IS1 2013, IEC60079-1:2014
5. As detailed in EC type examination certificates:
   DEMKO 16 ATEX 1691X rev.0 and IECEx UL 16.0064X Issue 0
   Product Quality Assurance Notification: LCIE 03 ATEX Q0600
   Product Quality Assurance Report FR LC1/QAR08 0002
6. EMC: The following standards were also investigated for this certification: NFC 23-520, NFC 23-539, EN 50081-1, EN 55022 classe B, EN 55014, EN 61000-4-2, CEI 61000-4-2, CEI 61000-4-3, CEI61000-4-4, CEI 61000-4-5, CEI 61000-4-6, CEI 61000-4-8, CEI61000-4-11
7. The notified organization responsible for the follow-up of the ATEX directive is (Assessed by):
   LCIE, B.P.8, F92260 Fontenay-aux-Roses - Identification number: 0081
8. The company in charge of certification CEM is LCIE BUREAU VERITAS, Aire de la Thur 68840 Pulversheim

UL Declaration of Conformity

Part number Model HH_X and AH_X model for use in Class I, Group C & D

UL 1203 Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations C22.2 No. 30-M1986 - Explosion-Proof Enclosures for Use in Class I Hazardous Locations

UL Certificate No. E78446

The notified organization responsible for the follow-up inspections for this UL listing is (Assessed by):

UL International (France) SA
Espace Technologique de Saint-Aubin, Immeuble Explorer
Route de l’Orme des Mérisses – F-91190 SAINTAUBIN:
Identification number: 675
Unscrew the 3 CHc M6 screws to remove the connection box

Slide right to unlock Connector Wiring  
Align Bumps and Notches to take Connector out

Prepare the wires  
Tighten Pressure screw  
Crimp the wires and screw it on connector

Align Bumps and Notches and push-in  
Slide left to lock connector in place

Put Connection box in place and screw 3 CHc screws on recommended torque