**Industrial Duty Rotary Encoder**

**Shaft Encoders**

**ZB Series**

- Single Channel or Quadrature Output Models
- Current Sinking, 250 mA Maximum
- 4.75 to 28 Vdc Supply Voltage
- Up to 1000 PPR for High Resolution Precision Counting or Speed Measurement
- 6000 RPM Shaft Speed
- Conversion Bracket for Length Sensor Measurement

The ZB Series shaft encoders are general duty industrial rotary pulse generators. The AU-ZBG models are for single channel sensing for counting, one directional measuring or speed applications. The AU-ZBH models are for quadrature applications, allowing for counting up and down along with speed and direction measurements. A conversion bracket is available to easily convert this encoder into a length measuring sensor. They can be direct-coupled to a machine shaft by means of a flexible-bellows, spring, or rubber sleeve type coupling that allows for axial and radial misalignment. They can also be coupled with light instrument timing-belts. Timing-belt drives also allow convenient gear-up or gear-down speed ratio changes that can be useful for obtaining non-standard PPR rates.

**Specifications**

**Electrical**

Supply Voltage: 4.75 to 28 Vdc @ 80 mA maximum from 0 to 85°C (32 to 185°F)
4.75 to 24 Vdc @ 80 mA maximum from 0 to 100°C (32 to 212°F)

Output: Current sinking, 250 mA maximum current per output

ZBG (Single Channel): 250 mA maximum
ZBH (Quadrature): 250 mA maximum current per output (quad. phase relationship is 90° ±22.5 electrical degrees)

Maximum Frequency: 1000 ppr, 20 KHz
Connections: 6-pin MS style connector (male) (MIL-C-5015)

**Function**

<table>
<thead>
<tr>
<th>Function</th>
<th>6-Pin MS Conn</th>
<th>Cable Wire Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>+Vdc</td>
<td>A</td>
<td>RED</td>
</tr>
<tr>
<td>COMMON</td>
<td>B</td>
<td>BLACK</td>
</tr>
<tr>
<td>DATA A</td>
<td>C</td>
<td>WHITE</td>
</tr>
<tr>
<td>DATA B (if applicable, quad)</td>
<td>D</td>
<td>GREEN</td>
</tr>
<tr>
<td>NO CONNECTION</td>
<td>E</td>
<td>—</td>
</tr>
</tbody>
</table>

AU-ZBG01002 industrial duty encoder, 100 ppr with 6-pin MS connector, shown smaller than actual size.
MECHANICAL
Maximum Shaft Speed: 6000 RPM
Shaft Diameter: 9.5 mm (0.375")
Radial Shaft Load: 18 kg (40 lbs) operating
Axial Shaft Load: 13.6 kg operating (30 lbs)
Starting Torque: ZBG and ZBH: 0.38 oz-in
(2.68 N-mm)
Moment Of Inertia: 6.5 x 10⁻6 oz-in-sec²
Housing: Black non-corrosive finished 6063-T6 aluminum
Bearings: ABEC 3 double sealed ball bearings
Weight: 10 oz (283.5 g)
ENVIRONMENTAL
Operating Temperature: 0 to 100°C
(32 to 212°F) (see supply voltage on previous page)
Storage Temperature: -25 to 85°C
(-13 to 185°F)
Humidity: 98% RH non-condensing
Vibration: 10 g @ 58 to 500 Hz
Shock: 50 g @ 11 msec duration

Length Sensor Measurement Accuracy
Factors which affect measurement accuracy include measuring wheel accuracy and wear,
and material conditions. Ideally, materials which are hard, thin and strong provide good
readings, conversely, soft, thick and elastic materials can present problems in obtaining
true readings. The great majority of these situations, where this effect is consistent, can
be compensated for by applying a multiplier to the quadrature output pulse train so as to
obtain a corrected measurement. Counter
or Rate Indicators with “input scaling” can
compensate for measuring wheel wear and
material elastic and compliance errors.

Wheels–
Maximum Wheel Speed is 600 RPM
“F” style wheels are made with a tan
polyurethane tread and are used for soft,
smooth materials such as paper, matting,
cardboard and fine weave textiles. The broad
width minimizes contact pressure and the tan
polyurethane tread minimizes marking.

Dimensions: mm (inch)

CAUTION: Downward tension on signal cable can cause wheel(s) to lift. Make sure
cable is clamped to machine frame near encoder and allow slack.

NOTE: The weight at the Length Sensor unit
provides sufficient traction for accurate operation
when mounted as shown, with arm angle from
horizontal not exceeding ±30°, and with hinge clamp
toward the far extreme of the extension arm.

Length Sensors should be mounted so measuring
wheel(s) contact ribbon, strip or web as it passes over
a roller. As an alternative, wheel(s) can be driven by
roller surface next to material being measured.
The “K” style wheel is diamond knurled aluminum and used on rubber, course weave fabrics, rough wood surfaces, foam and insulation.

Dimensions: mm (inch)

To Order Visit omega.com/zb_series for Pricing and Details

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU-ZBG01002</td>
<td>Single channel shaft encoder, 100 ppr</td>
</tr>
<tr>
<td>AU-ZBG10002</td>
<td>Single channel shaft encoder, 1000 ppr</td>
</tr>
<tr>
<td>AU-ZBH01002</td>
<td>Quadrature encoder shaft encoder, 100 ppr</td>
</tr>
<tr>
<td>AU-ZBH10002</td>
<td>Quadrature encoder shaft encoder, 1000 ppr</td>
</tr>
</tbody>
</table>

ACCESSORIES

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCARPG01</td>
<td>6-pin MS connector with 3 m (10’), 22 AWG 4-conductor with drain, shielded cable</td>
</tr>
<tr>
<td>CCARPG025</td>
<td>6-pin MS connector with 7.6 m (25’), 22 AWG 4-conductor with drain, shielded cable</td>
</tr>
<tr>
<td>CCARPG050</td>
<td>6-pin MS connector with 15 m (50’), 22 AWG 4-conductor with drain, shielded cable</td>
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<tr>
<td>AU-RPGFC002</td>
<td>Flexible shaft coupling, 25 mm (1”) long, 0.250 - 0.375”</td>
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<tr>
<td>AU-RPGFC003</td>
<td>Flexible shaft coupling, 25 mm (1”) long, 0.375 - 0.375”</td>
</tr>
<tr>
<td>AU-RPGFC004</td>
<td>Flexible shaft coupling, 25 mm (1”) long, 0.375 - 0.500”</td>
</tr>
<tr>
<td>AU-RPGFC005</td>
<td>Flexible shaft coupling, 25 mm (1”) long, 0.375 - 6 mm</td>
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<tr>
<td>AU-LSCB1000</td>
<td>Length sensor conversion bracket</td>
</tr>
<tr>
<td>AU-LSAH001</td>
<td>Hinge clamp assembly for sensor conversion bracket</td>
</tr>
<tr>
<td>AU-WF1000F</td>
<td>0.3 m (1’) circumference urethane measuring wheel</td>
</tr>
<tr>
<td>AU-WF1000K</td>
<td>0.3 m (1’) circumference knurled measuring wheel</td>
</tr>
<tr>
<td>AU-WM0400F</td>
<td>¾th meter circumference urethane measuring wheel</td>
</tr>
<tr>
<td>AU-WM0400K</td>
<td>¾th meter circumference knurled measuring wheel</td>
</tr>
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</table>

Ordering Examples: AU-ZBG10002 single channel shaft encoder with 1000 ppr, CCARPG01, 6-pin MS connector with 3 m (10’) cable, and AU-RPGFC003, flexible shaft coupling, 0.375-0.375”.

AU-ZBH10002 quadrature encoder with 1000 ppr, CCARPG01 3 m (10’) cable with 6-pin MS connector, and AU-WF1000F 0.3 m (1’) circumference urethane measuring wheel.