

# INDUSTRIAL DUTY ROTARY ENCODER SHAFT ENCODERS

**NEW**

## 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)

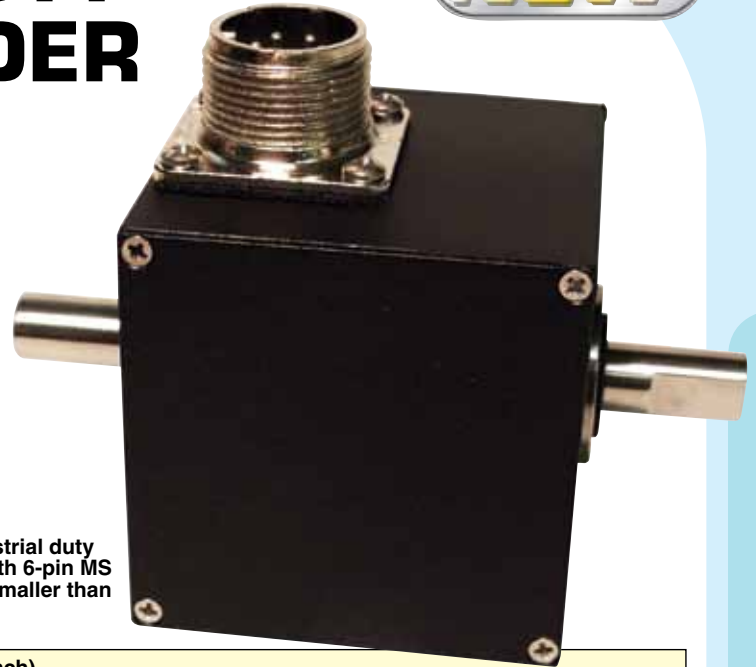
**Output:** Current sinking, 250 mA maximum current per output

**ZBG (Single Channel):** 250 mA maximum

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

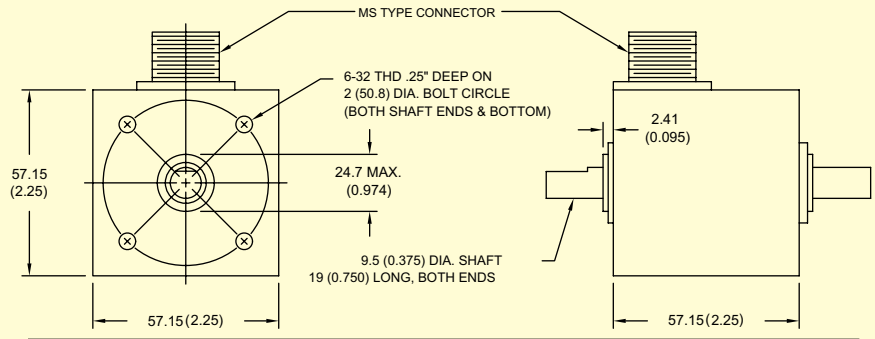
**Maximum Frequency:** 1000 ppr, 20 KHz

**Connections:** 6-pin MS style connector (male) (MIL-C-5015)

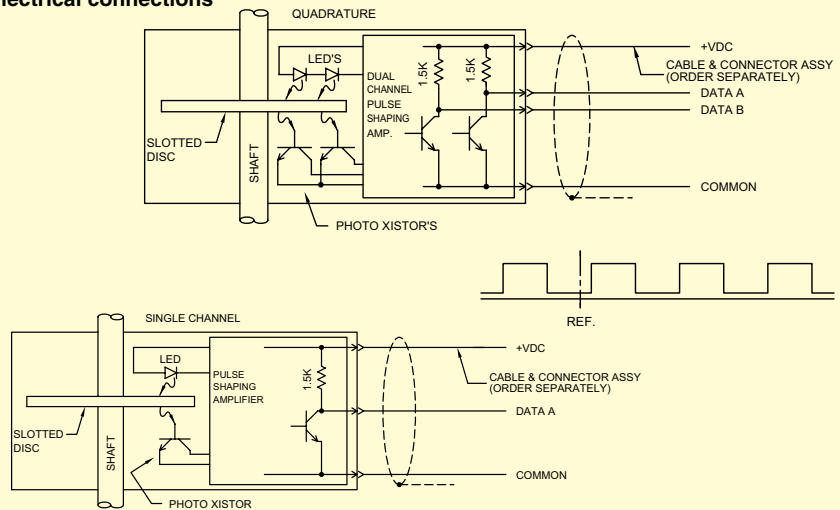


AU-ZBG01002 industrial duty encoder, 100 ppr with 6-pin MS connector, shown smaller than actual size.

### Dimensions: mm (inch)



### Electrical connections



FUNCTION	6-PIN MS CONN	CABLE WIRE COLOR
+Vdc	A	RED
COMMON	B	BLACK
DATA A	C	WHITE
DATA B (if applicable, quad)	D	GREEN
NO CONNECTION	E	—



### 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:**  $6.5 \times 10^{-6}$  oz-in-sec<sup>2</sup>

**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

**Note:** NPN Transistor outputs have 1.5 KΩ load resistors returned to supply for internal feed back purposes. This does not interfere with the ability to use these outputs as conventional "Open-Collector" outputs as long as the supply voltage for the ZB is supplied by the indicator or control receiving its output signal. The ZB's internal load resistor also allows the output to be used as a current source, however, load current must be limited to 1 mA maximum

### Convert to Length Sensor

The length sensor conversion bracket, model AU-LSCB1000, comes with a 3 m (10') long, 4 wire shielded cable and a 6-pin MS connector. The hinge clamp assembly—model AU-LSAHC001, provides an easy method for attachment and mounting of the rotary encoder to be used as a length sensors with the AU-LSCB1000 conversion bracket. This can be used with one or two wheels as the application requires.

### 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)**

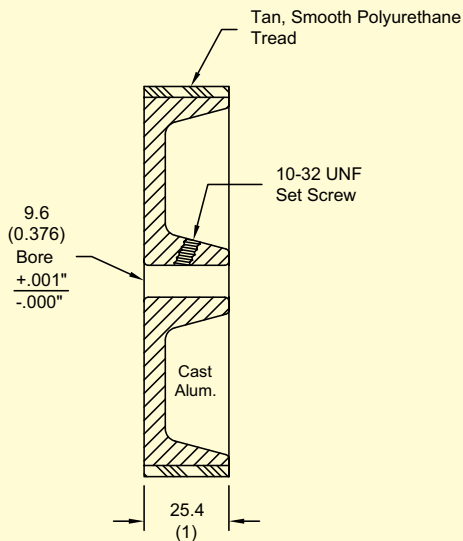
**CAUTION:** Downward tension on signal cable can cause wheel(s) to lift. Make sure cable is clamped to machine frame near encoder and allow slack.

**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  $\pm 30^\circ$ , and with hinge clamp toward the far extreme of the extension arm.

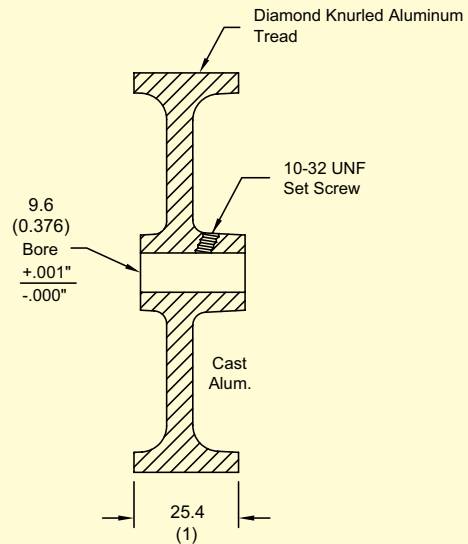
Length Sensors should be mounted so measuring wheel(s) contact ribbon, strip or web as it passes over a roller. As an alternative, wheel(s) can be driven by roller surface next to material being measured.

The "K" style wheel is diamond knurled aluminum and used on rubber, coarse weave fabrics, rough wood surfaces, foam and insulation.

Dimensions: mm (inch)



"F" style wheel has polyurethane tread.



"K" style wheel has knurled aluminum tread.

## To Order

MODEL NO.	DESCRIPTION
AU-ZBG01002	Single channel shaft encoder, 100 ppr
AU-ZBG10002	Single channel shaft encoder, 1000 ppr
AU-ZBH01002	Quadrature encoder shaft encoder, 100 ppr
AU-ZBH10002	Quadrature encoder shaft encoder, 1000 ppr

## ACCESSORIES

MODEL NO.	DESCRIPTION
CCARPG01	6-pin MS connector with 3 m (10'), 22 AWG 4-conductor with drain, shielded cable
CCARPG025	6-pin MS connector with 7.6 m (25'), 22 AWG 4-conductor with drain, shielded cable
CCARPG050	6-pin MS connector with 15 m (50'), 22 AWG 4-conductor with drain, shielded cable
AU-RPGFC002	Flexible shaft coupling, 25 mm (1") long, 0.250 - 0.375"
AU-RPGFC003	Flexible shaft coupling, 25 mm (1") long, 0.375 - 0.375"
AU-RPGFC004	Flexible shaft coupling, 25 mm (1") long, 0.375 - 0.500"
AU-RPGFC005	Flexible shaft coupling, 25 mm (1") long, 0.375 - 6 mm
AU-LSCB1000	Length sensor conversion bracket
AU-LSAHC001	Hinge clamp assembly for sensor conversion bracket
AU-WF1000F	0.3 m (1') circumference urethane measuring wheel
AU-WF1000K	0.3 m (1') circumference knurled measuring wheel
AU-WM0400F	$\frac{4}{10}$ th meter circumference urethane measuring wheel
AU-WM0400K	$\frac{4}{10}$ th meter circumference knurled measuring wheel

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.