

# EX11 Series— Miniature Incremental Rotary Optical Encoder

BEI Sensors



The EX11 Series was developed to provide a high precision, low cost enclosed shaft encoder for light duty applications. The EX11 offers benefits of the Opto-ASIC design with 1024 line counts in a 1.1 inch diameter size.

Packaged in a glass filled polycarbonate housing with 1/8" stainless steel shaft and precision bearings, the EX11 provides superior performance at a lower cost.

The EX11 Series is capable of operating over a temperature range of 0°C to +70°C without degradation of signals.

Proven design and Duncan Electronics' experience makes the EX11 perfectly suited for high volume OEM applications, including: robotics, process control and instrumentation.

## Mechanical Specifications

**Dimensions:** See Figure 1

**Weight:** 2.0 oz. (Approx.)

**Shaft Diameter:** 0.1247 +0.0000/-0.0003

**Shaft Load:** axial 2 lbs., Radial 1 lb.

**Torque, starting:** less than 0.4 oz. in.  
**running:** less than 0.2 oz. in.

**Inertia:**  $3.0 \times 10^{-5}$  oz. in./sec

## Motor Interface

**Servo Mounting Holes:** 4 places #2-56 @ 90° on 0.75"B.C.

**Servo Mount:** designed to accommodate motor mount cleat "PIC type" L2-2

**Flange Mounting Holes:** 4 places .100 dia. through holes

**Shaft Coupling:** must be flexible (do not hard mount)

## Electrical Specifications

**Code:** incremental

**Pulses per Revolution:** see "Ordering Options"

**Supply Voltage:** +5 volts  $\pm$  5% @ 80mA max.

**Output Format:** dual channel Quadrature and index with complements (no index on EX112)

## Output Type:

-EX116- Line driver 26LS31 or equivalent

should be terminated into a line receiver

-EX112/EX113- Buffer driver 74F365 and 74F368 or equivalent. (not open collector)

**Rise Time:** 1.0 $\mu$ sec. max.

**Frequency Response:** see graph: Fig 3

## Environmental Specifications

### Temperature:

Operating: 0°C to +70°C

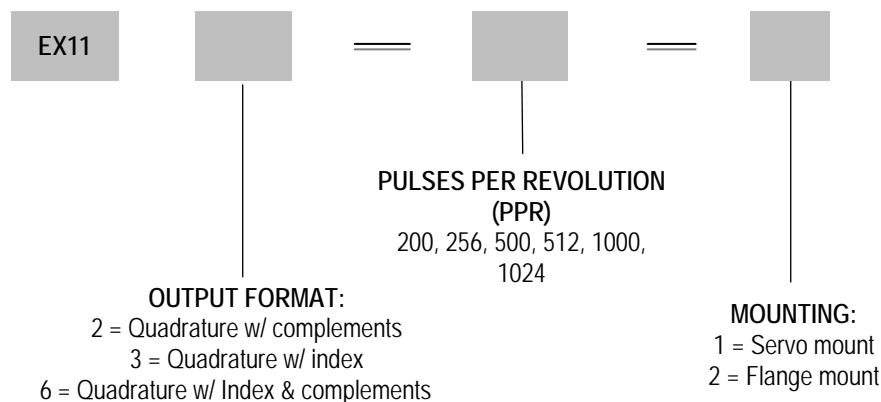
Storage: -25°C to +90°C

**Termination Type:** 28 AWG flat ribbon cable with 10 position connector FCI-Berg P/N 6690-310 or equivalent

Mates with FCI-Berg P/N 65863-165 or equivalent (mating connector not provided)

## EX11 Incremental Ordering Options for assistance, call 800.350.2727

Use this diagram, working from left to right to construct your model number (example: EX113-500-2)

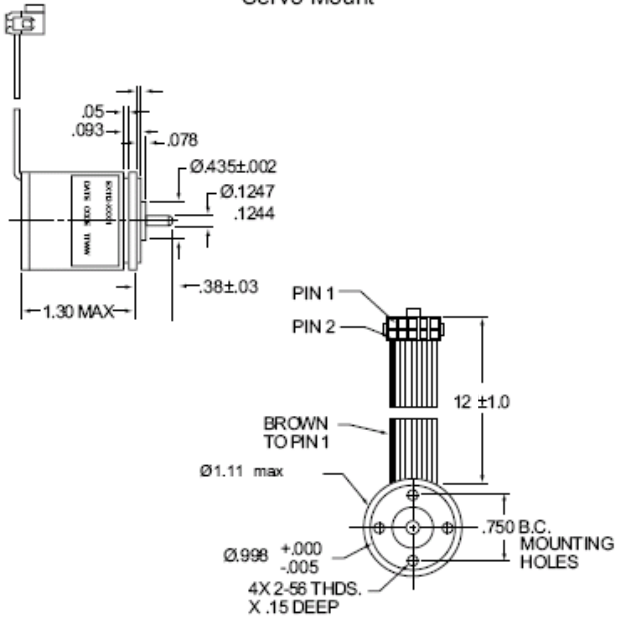


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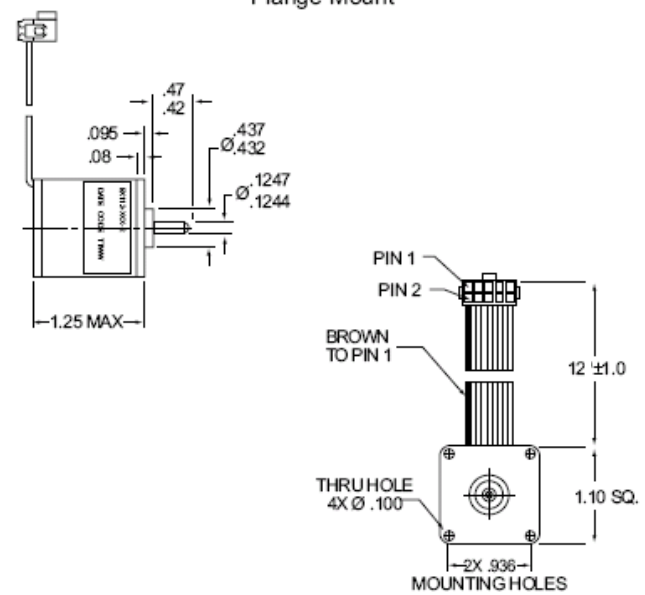
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## Dimensions

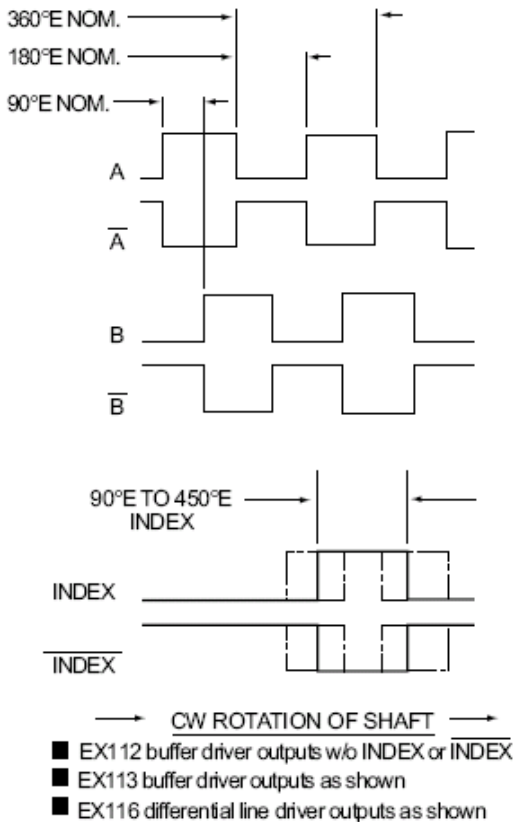
**Figure 1**  
Servo Mount



**Figure 2**  
Flange Mount

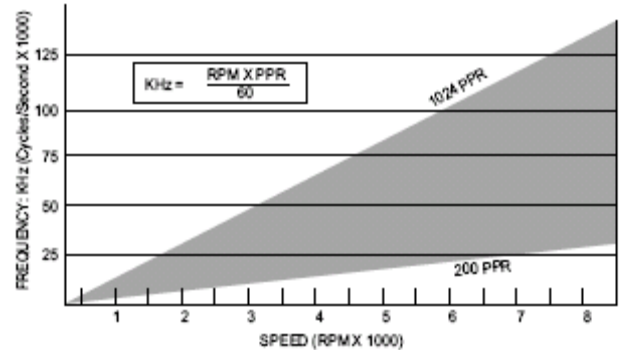


## Output Wave Form



## Frequency Response

**Figure 3**



## Pin Out

Pin No.	Color	Signal
1	Brown	N/C
2	Red	+5V
3	Orange	$\bar{B}$
4	Yellow	B
5	Green	$\bar{\text{index}}$
6	Blue	index
7	Violet	$\bar{A}$
8	Gray	A
9	White	N/C
10	Black	Ground



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