



## EX11 | SERIES

### MINIATURE INCREMENTAL ROTARY OPTICAL ENCODER



#### Introduction

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

<b>Dimensions</b>	See Figure 1
<b>Weight</b>	2.0 oz. (Approx.)
<b>Shaft Diameter</b>	0.1247 +0.0000/-0.0003
<b>Shaft Load</b>	axial 2 lbs., Radial 1 lb.
<b>Torque</b>	starting: less than 0.4 oz. in. running: less than 0.2 oz. in.
<b>Inertia</b>	$3.0 \times 10^{-5}$ oz. in./sec



#### MOTOR INTERFACE

<b>Servo Mounting Holes</b>	4 places #2-56 @ 90° on 0.75" B.C.
<b>Servo Mount</b>	Designed to accommodate motor mount cleat "PIC type" L2-2
<b>Flange Mounting Holes</b>	4 places .100 dia. through holes
<b>Shaft Coupling</b>	must be flexible (do not hard mount)

## ELECTRICAL SPECIFICATIONS

<b>Code</b>	Incremental
<b>Pulses per revolutions (PPR)</b>	See "Ordering Options"
<b>Supply Voltage</b>	5 volts $\pm 5\%$ @ 80mA max.
<b>Output Format</b>	Dual channel Quadrature and index with complements (no index on EX112)
<b>Output Type</b>	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)
<b>Rise Time</b>	1.0 $\mu$ sec. max.
<b>Frequency Response</b>	See Graph - Fig 3

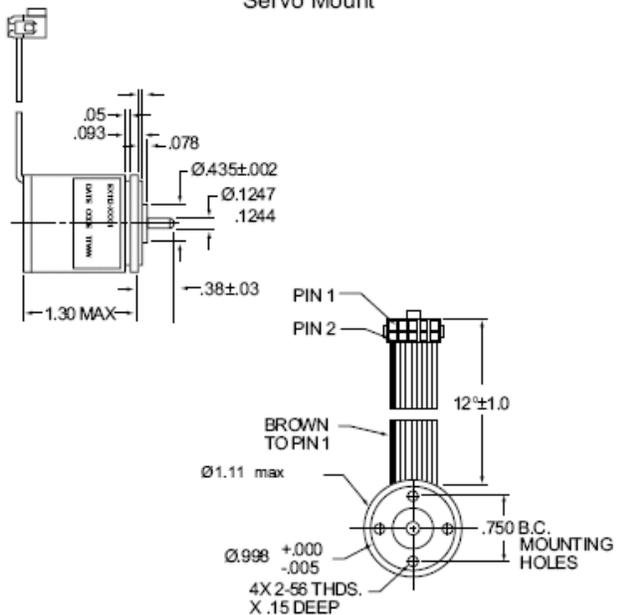
## ENVIRONMENTAL SPECIFICATIONS

<b>Temperature</b>	Operating: 0°C to +70C Storage: -25°C to +90°C
<b>Termination Type</b>	28 AWG flat ribbon cable with 10 position connector FXI-Berg P/N 6690-310 or equivalent Mates with FCI-Berg P/N 65863-165 or equivalent (mating connector not provided)

## DIMENSIONS

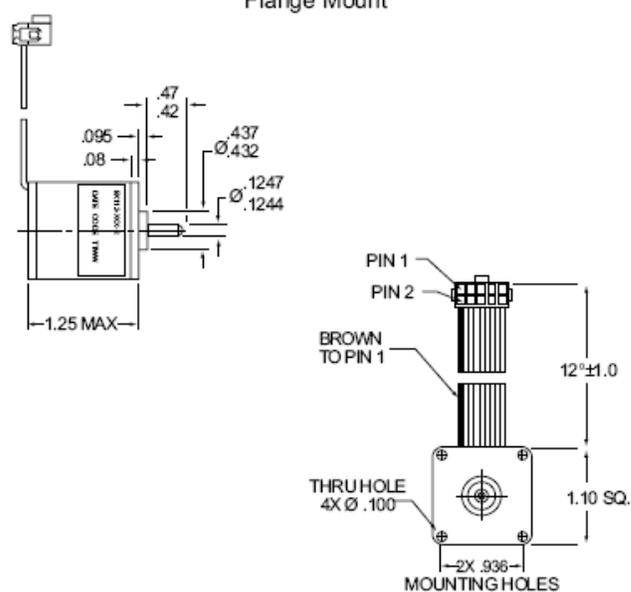
All dimensions are in: inches [millimeters]

**Figure 1**  
Servo Mount



All dimensions in inches

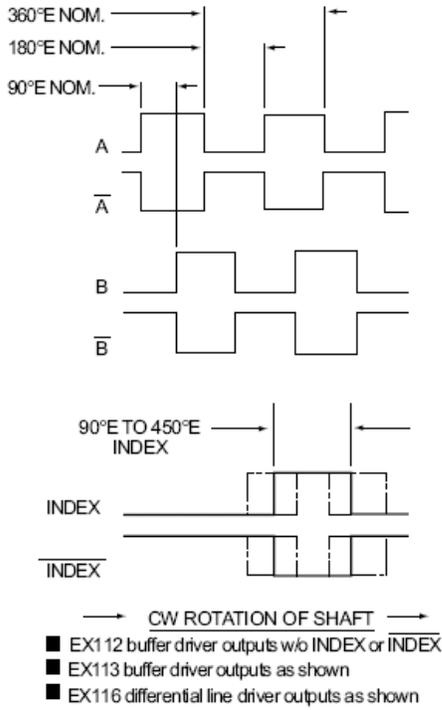
**Figure 2**  
Flange Mount



.xx =  $\pm .02$   
.xxx =  $\pm .005$

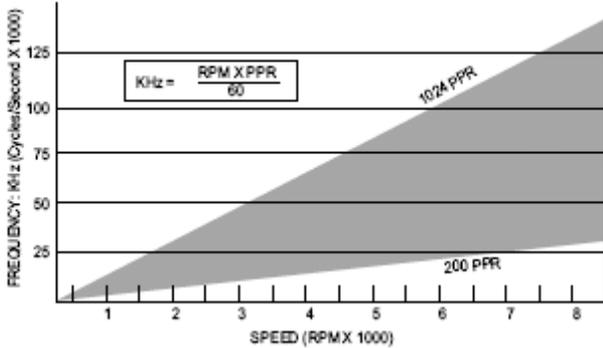


## OUTPUT WAVEFORM



## FREQUENCY RESPONSE

Figure 3

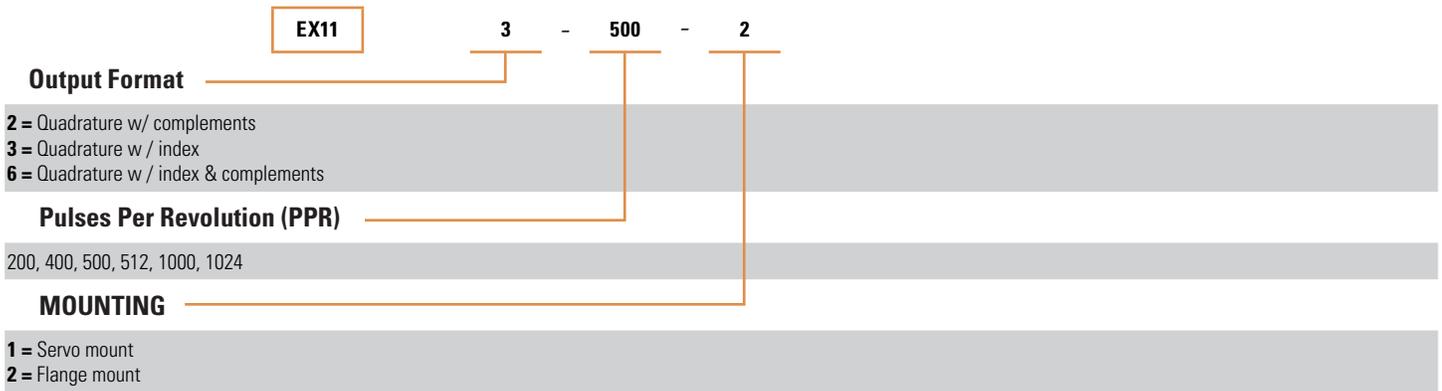


## PIN OUT

PIN No.	Color	Signal
1	Brown	NC
2	Red	+5V
3	Orange	$\bar{B}$
4	Yellow	B
5	Green	$\bar{INDEX}$
6	Blue	INDEX
7	Violet	$\bar{A}$
8	Gray	A
9	White	NC
10	Black	Ground



Use this diagram, working from left to right to construct your model number



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