

# 700 Series

## Optical Shaft Encoder

### DESCRIPTION:

The 700 optical incremental shaft encoders convert input shaft rotation into square wave output pulses to provide an accurate means of digitizing position, rate or direction of rotation. They are designed specifically for industrial applications requiring a rugged and reliable shaft encoder that is sealed against dust, oil vapor and moisture.

The shaft encoder produces an output signal by rotating a shatter-proof plastic disc with clear and opaque segments between a light emitting diode and a photo-transistor sensor. The output signal from the sensor is then converted into a square wave signal by an internal squaring circuit. The number of output pulses per shaft revolution is determined by the number of clear and opaque segments on the disc. Bidirectional models have a second LED and sensor positioned to produce two square wave signals in quadrature.

### SPECIFICATIONS:

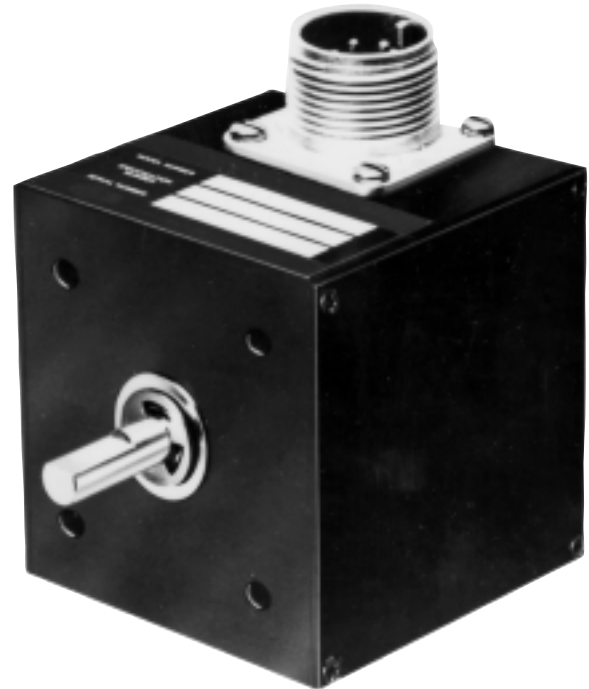
#### ELECTRICAL SPECIFICATIONS

##### INPUT:

Voltage .....5 VDC, or 8 to 30 VDC (Specify Choice)  
Current .....50 mA  $\pm$  10%  
Ripple .....2%  
Regulation ..... $\pm$ 5%

##### OUTPUT

Amplitude .....80% of input voltage (min.)  
Current .....Sink up to 20 milliamperes (10 milliamperes on multi-output units). 1.5K pull up to input voltage  
Polarity .....Positive  
Wave Shape .....Square wave, 50% "on" and 50% "off"  
Pulse Rate .....0 to 20,000 pulses per second  
Rise Time .....Less than 1 microsecond  
Pulses per Rev. ....1 to 1270 (Specify choice)  
Accuracy .....Within  $\pm$ 0.1 degrees from one pulse to any other pulse.

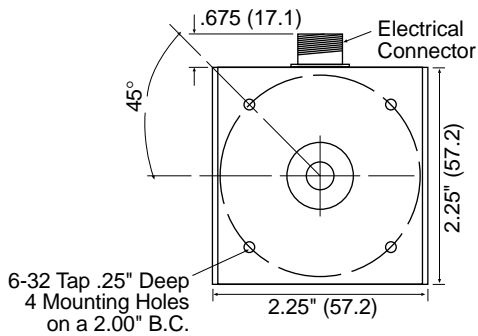
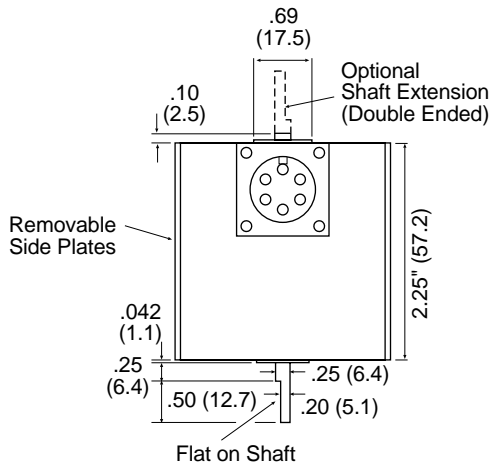


#### ENVIRONMENTAL SPECIFICATIONS

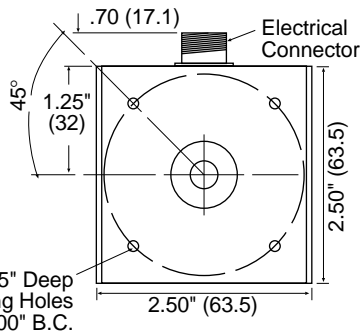
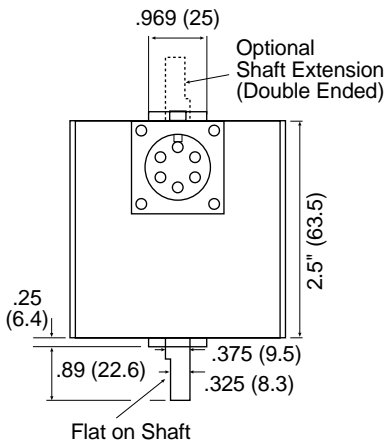
Temperature .....0 to 75 degrees C (+32°F to 167°F)  
Vibration .....3 g's at 5 to 1000 CPS  
Shock .....20 g's, 10 milliseconds

#### MECHANICAL SPECIFICATIONS

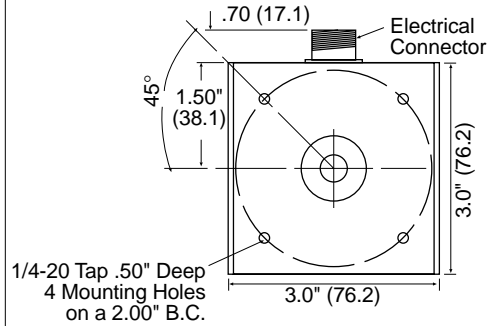
Shaft Speed .....6,000 RPM maximum  
Shaft Rotation .....Either direction  
Bearings .....Sealed ball bearings  
Starting Torque .....0.10 ounce-inches  
Moment of Inertia ....0.0025 ounce-inches seconds squared  
Radial Loading .....10 pounds operating  
Axial Loading .....5 pounds operating  
Shaft Size ......250" or .375" diameter (Specify choice)  
Shaft Type .....Single or double ended (Specify choice)  
Operating Life .....100,000 hours average  
Housing .....Aluminum with black anodized finish. Sealed against dust, oil vapor and moisture.  
Mounting .....Provisions for either base or face mounting  
Weight .....A-10 oz., B- 3.75 lbs., C- 3.25 lbs., D- 6 lbs.  
Connector Type .....6-pin MS Connector or Solder Terminals

**A HOUSING**

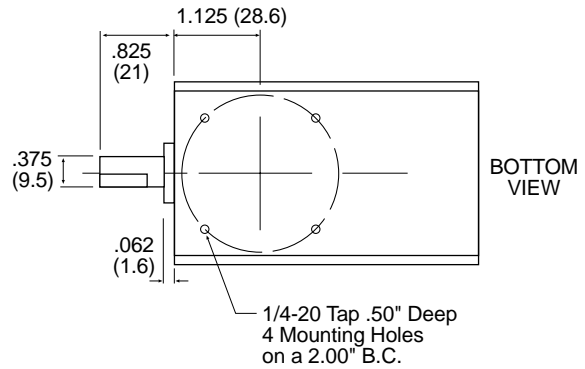
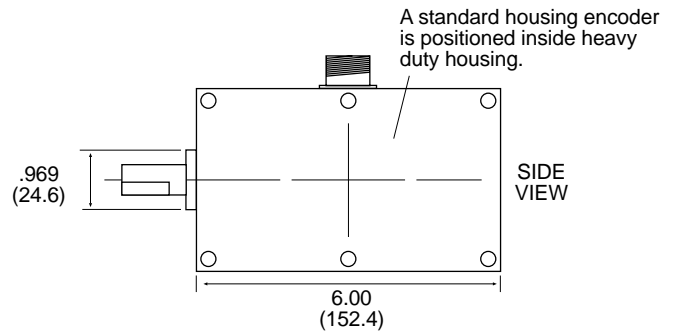
The same mounting hole pattern is also provided on the opposite end and the base.

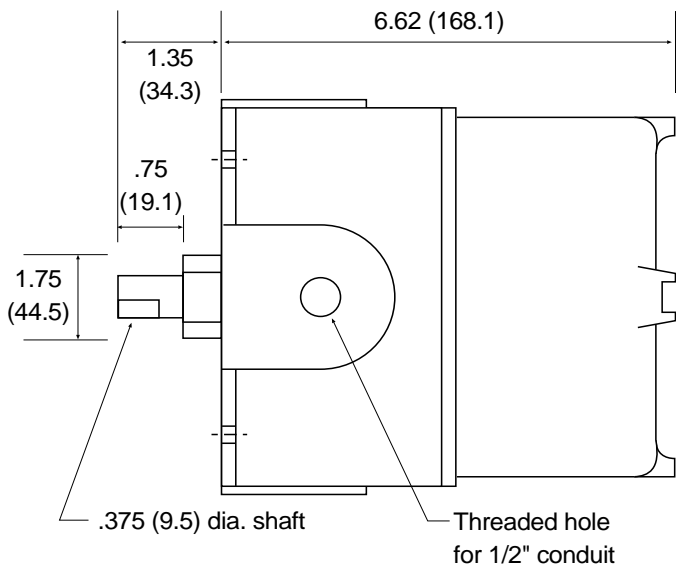
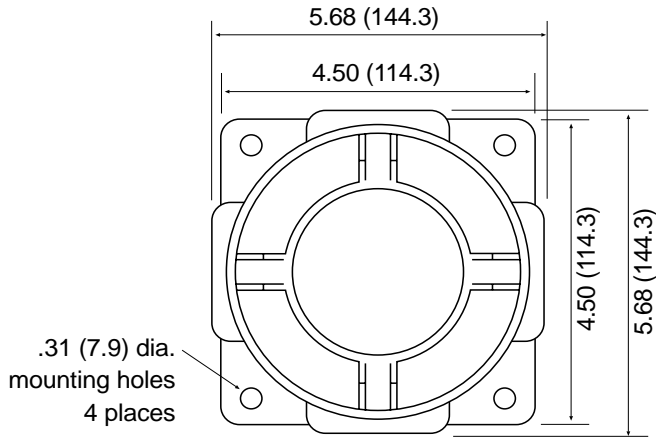
**B HOUSING**

The same mounting hole pattern is also provided on the opposite end and the base.

**C HOUSING**

The same mounting hole pattern is also provided on the opposite end and the base.





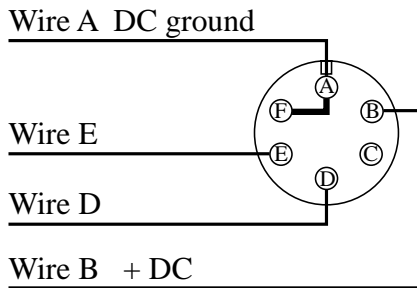
Type	Order Number
Single Channel	711 12VDC 600PPR A1
Square Wave Pulse	711 12VDC 1200PPR A1
Dual Channel	716 12VDC 600PPR A1
Quadrature	716 12VDC 1200PPR A1

**How To Order Special Encoders:**

**EX: 715-1 12VDC 200PPR 50US 500RPM A1 L2.3**

<b>Series</b>	711 (Single Square Wave Pulse) 712 (711 with Reference Pulse) 713 (2 Different Square Waves) *715-1 (Bi-Directional; 2 Channels) *715-2 (Bi-Directional; 1 Channel plus direction) 716 (Quadrature) *717 (High Resolution 711l)
<b>Input Voltage</b>	5 VDC 12 VDC 15 VDC 24 VDC
<b>Pulses Per Rev. Over 600PPR</b> (Model 713 ex.: 100/200 PPR)	
<b>*Pulse Width (if required)</b>	ms = milliseconds us = microseconds
<b>Shaft Maximum RPM (specify)</b>	
<b>Housing Type</b>	A. Standard A1. Single Shaft A2. Dual Shaft B. Industrial: B1. Single Shaft B2. Dual Shaft C. Heavy Duty Housing: C1 (with mating connector) C2 (with mating connector & shaft seal) C3 (with 1/2" conduit thread & terminal strip) C4 (with shaft seal, 1/2" conduit thread & terminal strip) C5 (extra heavy duty up to 50lb. radial load : 10mm shaft) D. Explosion Proof (Class 1, Groups C & D / Class 2 Groups E, F, G / NEMA 7 & NEMA 9)
<b>Other Options</b>	L- Custom Shaft B - 3/8" shaft option ENC MS: Extra mating connector ENC-CABLE##: Extra mating connector with 4-conductor cable Reference Pulse - Add 1N (neg. pulse) or 1P (pos. pulse) after PPR

**WIRING**



Encoder Model #	Wire D	Wire E
711	pulses	N/C
715-1	CW pulses	CCW pulses
715-2	pulses	hi-cw/lo-ccw
716	Quad "A"	Quad "B"
717	pulses	N/C

See the following page for Mounting Brackets and Measuring Wheels.

# ENCODER ACCESSORIES

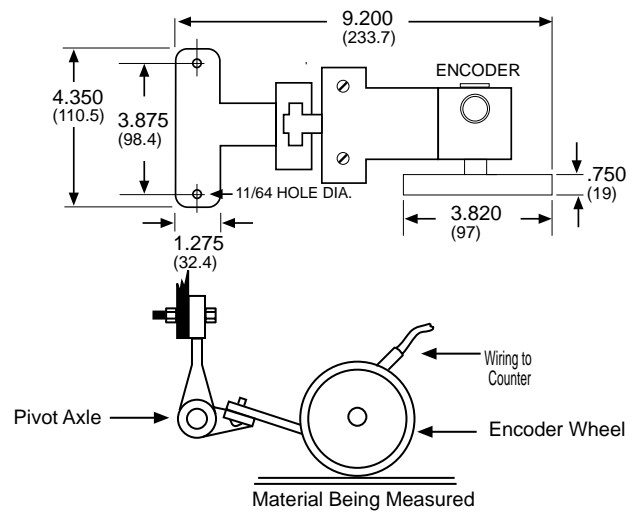


MEASURING WHEELS			
1 FOOT (304.8mm) CIRCUMFERENCE		1/3 METER (13.12" CIRCUMFERENCE)	
Bore	.251 (6.38mm) ID		Bore .251(6.38mm) ID
Face Width	1/2" (12.7mm)	1" (25.4mm)	Face Width 1/2" (12.7mm)
Rubber	15537-070	15537-530	Rubber 407186-009
Smooth	15537-095	15537-525	Smooth 407186-010
Knurled	15537-510	15537-535	Knurled 407186-011
Grooved	15537-187		
For 3/8" bore add 3/8 to end of part number			

## ENCODER BRACKET

Plate Mount Model 7005

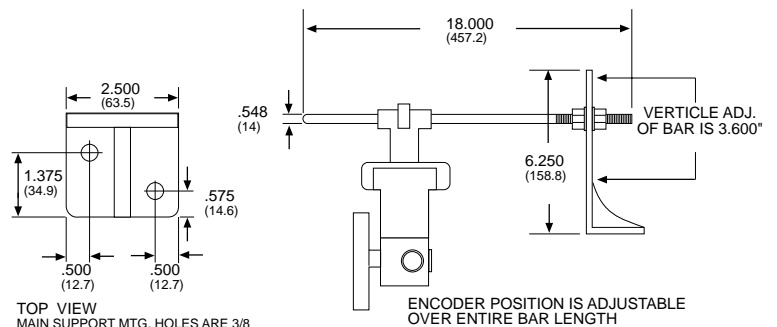
Use with 700 series Encoders



## ENCODER BRACKET

Surface Mount Model 7006

Use with 700 series Encoders



ENCODERS