

MOD920-97 Series—Low Profile Incremental Kit Encoder

BEI Industrial Encoders



The MOD920-970 family of encoders offers dozens of resolutions and diameters in an extremely compact package. This industry standard mount design offers flexible mounting alternatives for both the caliper and code disc. A locking connector assures a trouble-free electrical interface. The encoder disc is available with optical radii as small as 9.78mm and resolutions as high as 2540 CPR. A photographic film disc is available as a lower cost alternative to the standard stainless steel disc.

Our phased-array ASIC technology allows for the widest air gap in the industry, with a 0.030" air gap. This enables the MOD920-970 encoders to be very tolerant to mounting alignment issues, enabling them to be installed easily without tight tolerance constraints. The MOD920-970 also can be custom designed to suit your exact applications with custom code disc radiuses along with dedicated resolutions between 100 to 2540. Code discs can be made to accommodate shaft diameters from less than 1mm to several inches.

Mechanical Specifications

Dimensions: See Figure 1
Mechanical Travel: Continuous
Weight: 5 grams

Environmental Specifications

Vibration: 5G peak, 60-2,000 Hz
Shock: 50G, half sine pulse, 5ms duration
Operating Temperature Range: 0° to +90°C
Storage Temperature Range: -25° to +90°
Enclosure: Unsealed housing

Electrical Specifications

Code: Incremental
Cycles per revolution (CPR): (Ref. Table 1)
Output Format: Digital, Dual Channel ("A", "B") w/quadrature and optional index
Input Voltage: 5.0V ± 0.25VDC
Frequency Response: 100kHz, Data and Index (up to 350kHz optional)
Output Type: TTL output (4.0V min. @500µA source, 0.8V max. @ 16mA sink)
Symmetry/Duty Cycle: 180° ± 36°
Input Current: 60mA maximum, 40mA typical
Rise Time w/2kΩ pull-up resistor⁽¹⁾: 800nSec
Fall Time w/2kΩ pull-up resistor⁽¹⁾: 200nSec
Optional Index Width (one CPR, see Fig 2):
 if ungated: 90° to 450° w/no relation to data "A" or "B"
 if gated⁽²⁾: w/data "A" and "B": 45° to 135°
Edge Separation: 90° ± 45°

Caliper Termination/ Mounting/ Alignment

Type: 5 position positive locking connector, AMP 103635-4. Mates with AMP 103959-4, 640442-5 or 94035-5; FCI-Berg 65039-032; Molex Series 70400 or 70066 "G" (other connector options available).

Pinout: See Figure 3

Mounting: 2x 2-56 or M2.5 x 0.45

Alignment: Minor Adjustment of the caliper within the tolerances of the mounting holes may be necessary to optimize the INDEX pulse.

Mating Codewheel

Stainless Steel, 0.051mm thick (Photographic film disc is available, maximum temperature 105°C) Available in optical radii from .385 to .920 inches. See Table 1

MOD920-970 Series Encoder Ordering Options: for assistance, call 800.350.2727

Use this diagram, working from left to right to construct your model number (example: **MOD920-200-0-1-18**)

MOD9	X	ZZZZ	0	1	18
OPTICAL RADIUS-DATA mm (in) <i>See Table 1 for Available CPR</i>		Cycles Per Revolution (CPR) <i>Use Table 1 to select available CPR based on selected optical radius</i>	DISC MATERIAL 0= Stainless Steel 1= Photographic Film	HUB 0= No Hub 1= Hub	BORE w/ hub w/o hub
2= 9.78 (0.385) 3= 11.00 (0.433) 4= 12.24 (0.482) 5= 15.29 (0.602) 6= 21.13 (0.832) 7= 23.37 (0.920)					18= .187 in 30= .301 in 25= .25 in 49= .492 in 38= .375 in 75= .751 in 6M= 6mm 8M= 8mm 10M= 10mm

X	Optical Radius-Data mm (in)	Cycles Per Revolution (CPR) ZZZZ																
		100	128	200	250	256	360	400	500	512	800	960	1000	1024	2000	2048	2500	2540
2	9.78 (.385)			•		•			•	•			•	•				
3	11.00 (.433)	•		•	•	•	•	•	•	•			•	•				
4	12.24 (.482)																	
5	15.29 (.602)		•	•					•	•	•	•	•	•	•			
6	21.13 (.832)														•	•	•	•
7	23.37 (.920)														•	•		

• - Indicates configurations currently available, consult factory for additional options.

Table 1

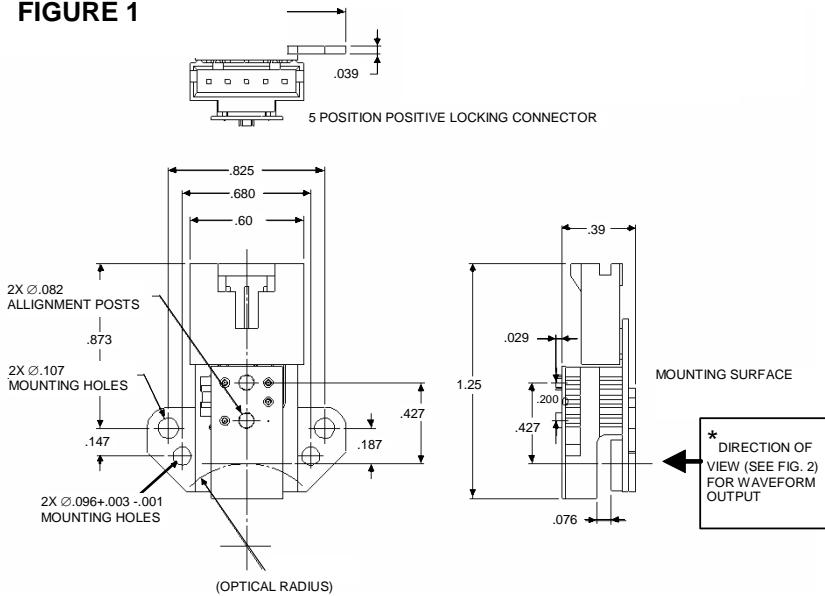
INDEX PULSE OPTION:
 0 = Quadrature, DATA "A" and DATA "B" only
 4 = Quadrature DATA "A" and DATA "B" with index

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Dimensions

FIGURE 1



Output

Waveform

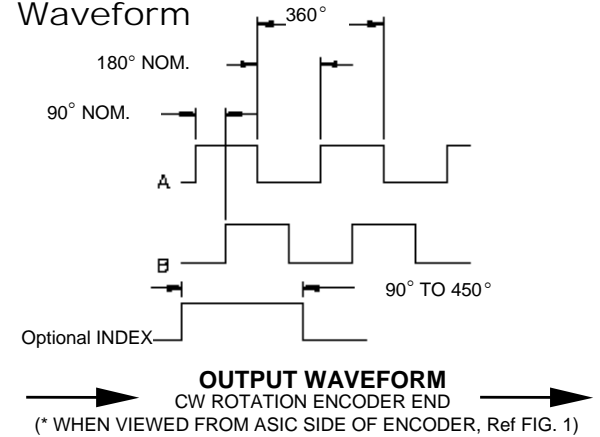


FIGURE 2

Installation Instructions

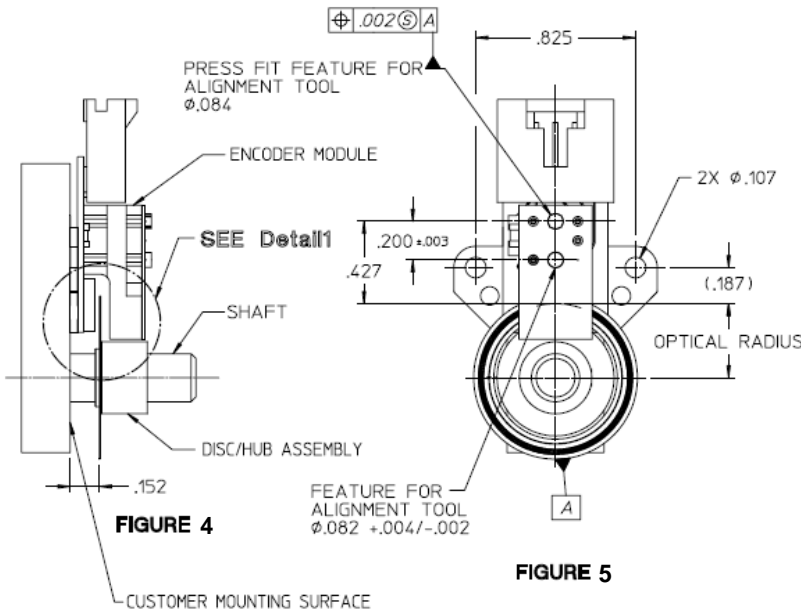


FIGURE 4

FIGURE 5

Pinout

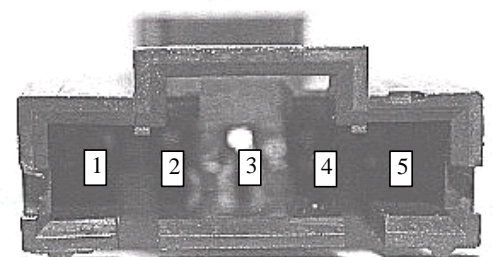


FIGURE 3

- PIN OUT**
 1- GROUND
 2- Index
 3- DATA "A"
 4- +5VDC (V_{cc})
 5- DATA "B"

Preparation

1. Make sure shaft has no burrs or other defects.

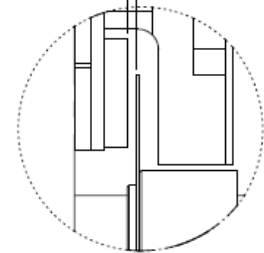
Installation:

1. Slide disc/hub assembly onto shaft. DO NOT tighten the set screw.
2. Per figure 4 dimension, raise the disc/hub assembly above the mount surface and tighten set screw (recommended torque range: 10 to 15 oz. in.).
3. Slide encoder module approx. in place, against mounting surface. CAUTION: DO NOT make contact with disc.
4. Position encoder per figure 5. (E.G. .427 + optical radius).
5. After positioning encoder, secure encoder with (e) #2-56 or M2.5x4.5 screws (recommended torque range is 15 to 20 oz. in.).
6. Inspect for air gap & readjust, if needed, disc height to dimension shown.

NOTE: If using mounting holes only, minor adjustment of the encoder module within tolerance of the mounting holes may be necessary to optimize the index pulse.

MAX. AIR GAP .022
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Detail1
 SCALE 4X



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