ENC-A6DN Differential Optical Kit Encoder

ANAHEIM AUTOMATION

FEATURES

- 64 to 10,000 Cycles Per Revolution (CPR)
- 2 Channel Quadrature TTL Squarewave Outputs
- Operating Temperature of -40° to +100° C
- Powered from a +5VDC Power Supply
- Positive Latching Connector
- Allows for ±0.010” Axial Shaft Play
- RoHS Compliant and REACH Certified

DESCRIPTION

The ENC-A6DN is a Differential Optical Kit Encoder designed for quick and simple assembly that fits any shaft diameters from 0.079” to 1”. It fits to any shaft length over 0.445” diameter when equipped with the Hole in Cover option. However, the default required shaft length is from 0.445” to 0.570” and the Cover Extension required shaft length is 0.445” to 0.750”. The ENC-A6DN module is designed to detect the rotary position with a code wheel. The ENC-A6DN can be attached to any existing shaft to provide digital feedback information. This Differential Encoder consists of a highly accurate aligned solid state light source and monolithic phased array sensor, when combined together they provide a system extremely tolerant to mechanical misalignments. The ENC-A6DN Differential Optical Kit Encoder has a molded, rugged 20% glass filled polycarbonate that utilizes a 10-Pin latching connector.

ORDERING INFORMATION

ENC - A6DN - 0100 - 079 - H - M

Index
N = No Index

CPR	
0064	1024
0100	1800
0200	2000
0400	2048
0500	2500
0512	
1000	

Bore Size	
079 = 2mm	375 = 3/8”
118 = 3mm	394 = 10mm
125 = 1/8”	472 = 12mm
156 = 5/32”	500 = 1/2”
157 = 4mm	551 = 14mm
188 = 3/16”	625 = 5/8”
197 = 5mm	750 = 3/4”
236 = 6mm	787 = 20mm
250 = 1/4”	875 = 7/8”
313 = 5/16”	984 = 25mm
315 = 8mm	1000 = 1”

Cover Options
E = Cover Extension (1)
H = Hole in Cover
Blank = Default

Base Options
3 = 0.125” Diameter for Three Base Mounting Holes (2)
M = Adds 4-Hole Mounting Adapter Plate
Blank = Default

(1) With Cover Extension “E” must choose bore size 079 (2mm) to 394 (10mm)
(2) With Base Option “3” must choose bore size 079 (2mm) to 394 (10mm)

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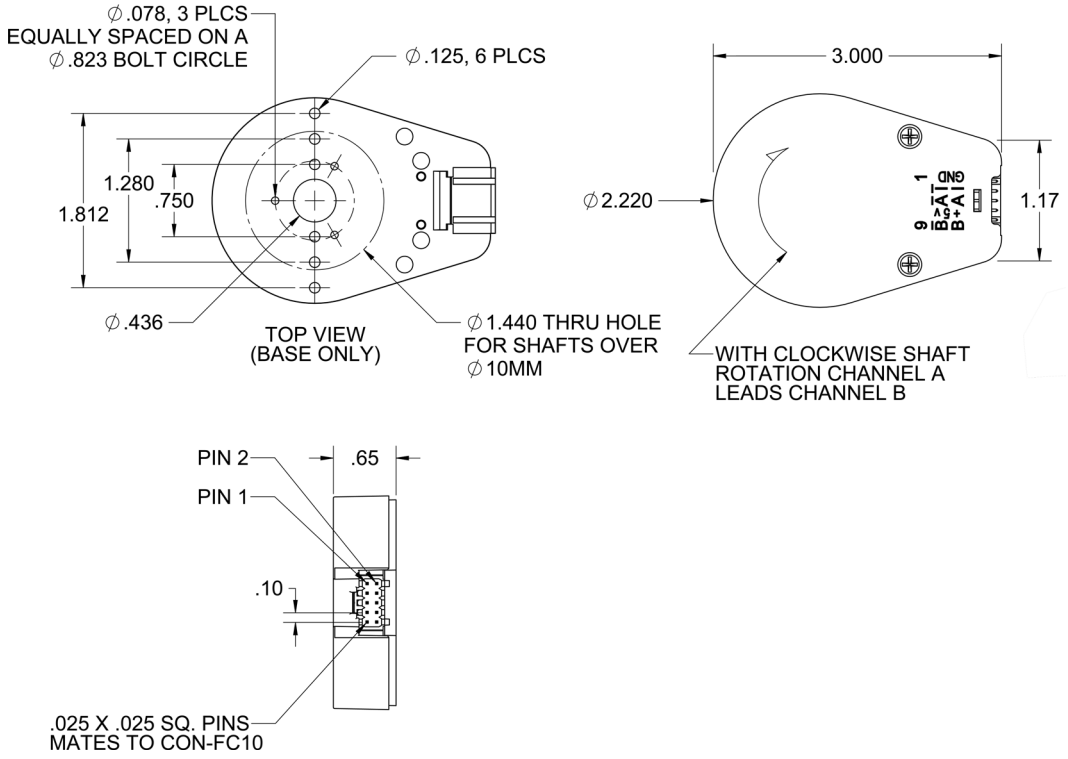
DIMENSIONS

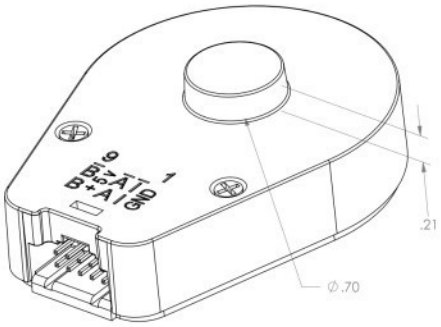
Default Cover and Base Option



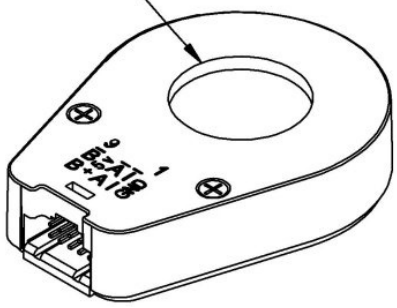
Note: Required shaft length is 0.445-0.570 inches.

COVER OPTIONS

E - Option



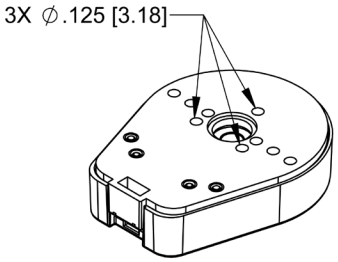
H option
thru hole



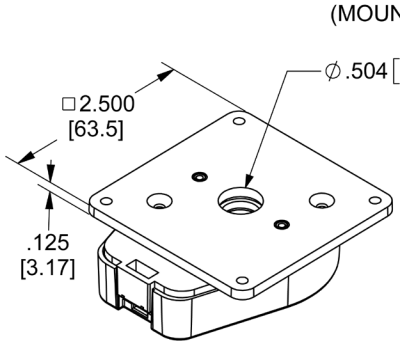
Cover Options:	Description
E - Option	E-Option provides a cylindrical extension cover for longer shafts of up to .750". The required shaft length is .445" to .750".
H - Option	H-Option adds a hole to the cover for the shaft to pass through. Shafts 2mm to 10mm, a .438" diameter hole is supplied. Shafts 12mm to 1", a 1.047" diameter hole is supplied.

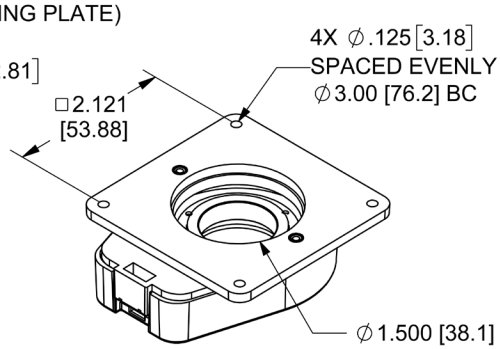
BASE OPTIONS

3-OPTION BASE
(.078 HOLES BECOME .125)



M-OPTION BASE
(MOUNTING PLATE)





FOR SHAFTS ≤ ∅.394 [10]

FOR SHAFTS > ∅.394 [10]

REQUIRES AN ADDITIONAL .125 [3.18] SHAFT LENGTH

Base Options:	Description
3 - Option	3-Option makes three of these hole diameters .125”
M - Option	M-Option, this adapter plate is for mounting to a 3” diameter bolt circle.

(Note: Base Mounting Screws are NOT included. #2-56 or M2.5 #4-40 screws can be used to mount the base to your mounting surface.)

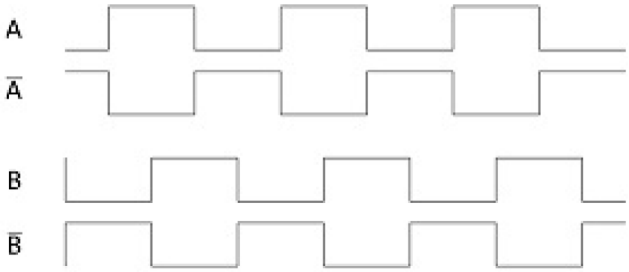
PIN/TIMING DIAGRAMS

DIFFERNTIAL ENCODER PINOUT

Pin #	Function
1	Ground
2	Ground
3	Index-
4	Index+
5	A- channel
6	A+ channel
7	+5VDC power
8	+5VDC power
9	B- channel
10	B+ channel

Note: 10-Pin Differential Mating Connector is Molex Type 15-04-5104

DIFFERENTIAL TIMING DIAGRAMS



SPECIFICATIONS

Terminology	Description
CPR(N):	The Number of Cycles Per Revolution
One Shaft Rotation:	360 mechanical degrees, N cycles
One Electrical Degree (°e):	1/360th of one cycle
One Cycle (C):	360 electrical degrees (°e). Each cycle can be decoded into 1 or 4 codes, referred to as X1 or X4 resolution multiplication
Symmetry:	A measure of the relationship between (X) and (Y) in electrical degrees, nominally 180 °e
Quadrature (Z):	The phase lag or lead between channels A and B in electrical degrees, nominally 90 °e
Index (CH I):	The Index Output goes high once per revolution, coincident with the low states of channels A and B, nominally 1/4 of one cycle (90°e)

Recommended Operating Conditions	Min	Max	Units
Temperature (CPR < 3600)	-40	100	°C
Temperature (CPR ≥ 3600)	-25	100	°C
Electrostatic Discharge, IEC 61000-4-2	-4	+4	kV

Parameter	Max	Units
Vibration (5Hz to 2kHz)	20	g
Max Shaft Axial Play	+/- 0.01	in.
Max Shaft Eccentricity Plus Radial Play	0.004	in.
Max Acceleration	250,000	rad/sec^2
Weight Single-Ended Differential	 0.09 0.11	 lbs lbs
Codewheel Moment of Inertia	8.9 x 10^{-5} for bore < 12mm 4.0 x 10^{-4} for bore ≥ 12mm	oz-in-s^2
Encoder Base Plate Thickness	0.135	in.

Parameter	Min	Typ	Max	Units
Supply Voltage	4.5	5.0	5.5	Volts
Supply Current CPR < 1000, no load CPR ≥ 1000 and < 3600, no load CPR ≥ 3600, no load	 - - -	 27 54 72	 33 62 85	 mA
Output Low I_{OL} = 8mA max (CPR < 3600) I_{OL} = 5mA max (CPR ≥ 3600) no load (CPR < 3600) no load (CPR ≥ 3600)	 - - - -	 - - 0.05 0.25	 0.5 0.5 - -	 Volts mA mA mA
Output High* I_{OH} = -8mA max (CPR < 3600) I_{OH} = -5mA max (CPR ≥ 3600) no load (CPR < 3600) no load (CPR ≥ 3600)	 2.0 2.0 - -	 - - 4.8 3.5	 - - - -	 Volts Volts Volts Volts
Output Current Per Channel (CPR < 3600)	-8.0	-	8.0	mA
Output Current Per Channel (CPR ≥ 3600)	-5.0	-	5.0	mA
Output Rise Time (CPR < 3600)	-	110	-	nS
Output Rise Time (CPR ≥ 3600)	-	50	-	nS
Output Fall Time (CPR < 3600)	-	35	-	nS
Output Fall Time(CPR ≥ 2000)	-	50	-	nS

Speed Calculation		Units
CPR ≤ 2500	18x10^6 / CPR	RPM
CPR > 2500 and ≤ 5000	21.6x10^6 / CPR	RPM
CPR > 5000	43.2x10^6 / CPR	RPM

ACCESSORIES

Cables:

The following cables are compatible with Anaheim Automation's A6DN series encoder. Select a cable length from the table below:

Cable Part Number	Length
ENC-CBL-AA4706	1 ft.
ENC-CBL-AA4706-5	5 ft.
ENC-CBL-AA4706-10	10 ft.

NOTE: For pricing and other information on cables and centering tools, please visit Accessories on our website.

Centering Tools:

Centering tools are optional, but recommended for a more precise installation.

ENC-CTOOL - 250

Bore Size	
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