

# ENC-A3I Single-Ended High Resolution Encoder with Index Channel



## FEATURES

- Accepts +/- 0.010" Axial Shaft Play
- 100 to 2500 Cycles per Revolution (CPR)
- Tracks 0 to 100,000 Cycles per Second
- 400 to 10,000 Pulses per Revolution (PPR)
- 2-Channel Quadrature TTL Squarewave Outputs
- Third Channel Index
- Operating Temperature of -40° to +100° C
- Powered from a Single +5VDC Power Supply
- RoHS Compliant and REACH Certified

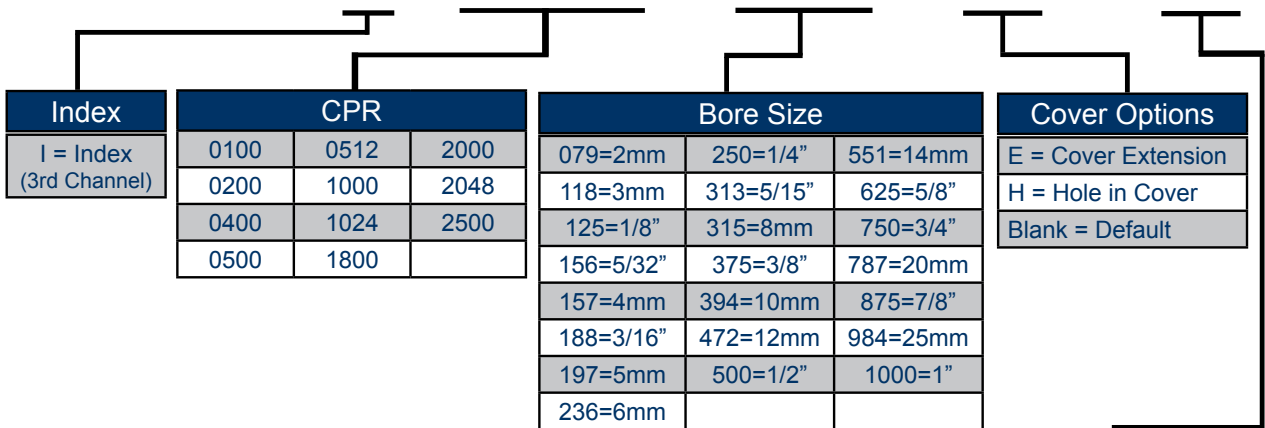


## DESCRIPTION

The ENC-A3I, a high resolution single-ended encoder with an optional third index channel, is a transmissive optical encoder module which requires a minimum shaft length of 0.445" and can be attached to shaft sizes ranging from 0.079" to 1" in diameter to provide to provide digital feedback information. The ENC-A3I encoder is designed to detect the rotary position with a code wheel. This single-ended encoder consists of a LED source lens and monolithic detector IC enclosed in a small polymer package. These modules implement phased array detector technology providing superior performance and tolerances over traditional aperture mask type encoders. The ENC-A3I series provides digital quadrature outputs on all resolutions and are capable of sinking and sourcing 8 mA each. These encoders are powered by a single +5VDC power supply and are RoHS compliant and REACH certified.

## ORDERING INFORMATION

# ENC - A3I - 1000 - 394 - H - G



Index
I = Index (3rd Channel)

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

Bore Size		
079=2mm	250=1/4"	551=14mm
118=3mm	313=5/15"	625=5/8"
125=1/8"	315=8mm	750=3/4"
156=5/32"	375=3/8"	787=20mm
157=4mm	394=10mm	875=7/8"
188=3/16"	472=12mm	984=25mm
197=5mm	500=1/2"	1000=1"
236=6mm		

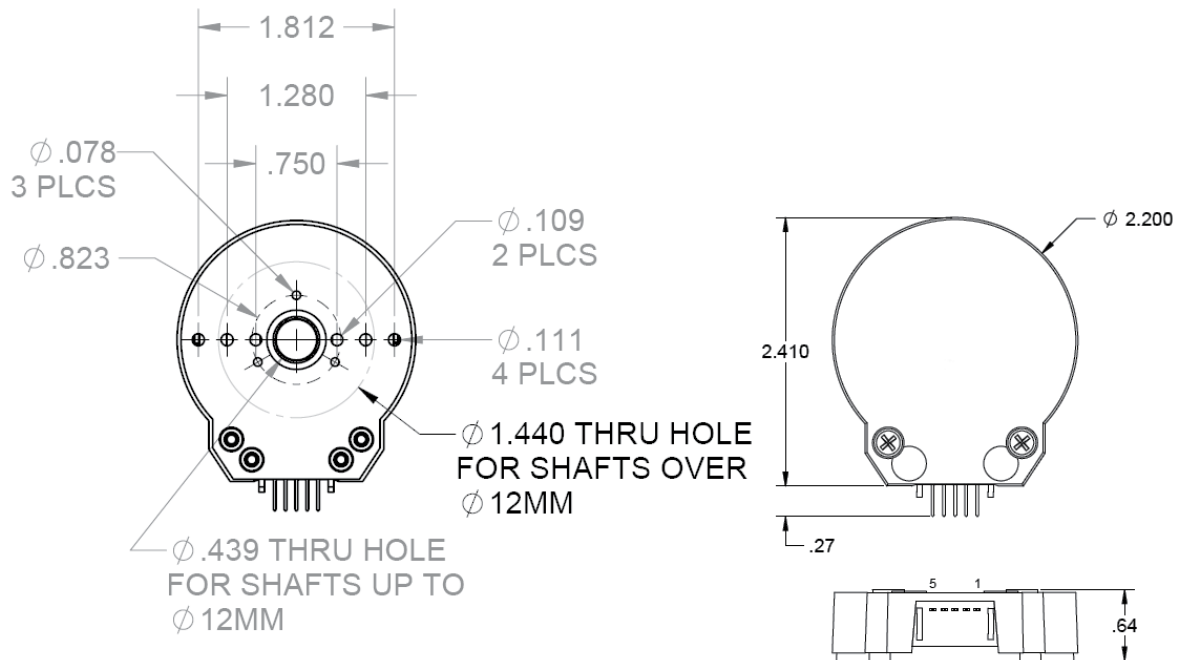
Cover Options
E = Cover Extension
H = Hole in Cover
Blank = Default

Base Options
3 = Base Mounting Holes Become 0.125"
M = 4-Hole Mounting Adapter Plate
T = Transfer Adhesive
Blank = Default

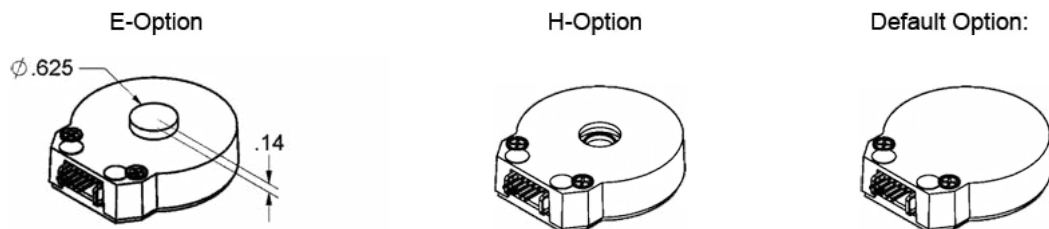
Note: H, M and T are the only options available for bore sizes exceeding .394 inches. Base must be either M or T when Bore size is 472. Cover must be H when Bore size is greater than 394.

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**DEFAULT OPTION:**



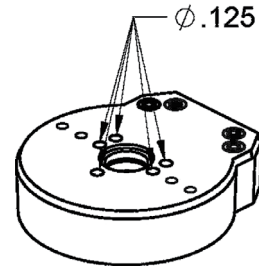
Note: Dimensions are in inches



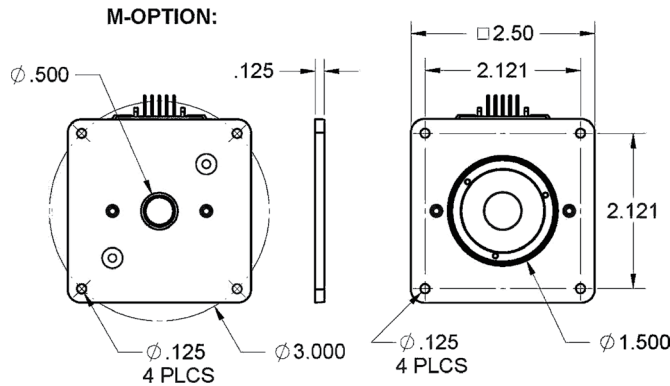
Note: All Dimensions are in (in)

Cover Options:	Description
E - Option	E-Option provides a cylindrical extension cover for larger shafts. For shaft diameters $\leq .472$ ", the required shaft length is .445" to .670". Note: E-option + M-Option the required shaft length is .570" to .795".
H - Option	Shaft $\leq 0.5$ " - a 0.55" diameter plate is used Shaft $> 0.5$ " diameter hole is used Required Shaft Length: $> .445$ " Note: H-Option + M-option the required shaft length is $> .570$ "
Default Option	The required length is .445" to .525" Note: Default Option + M-Option the required shaft length is .570" to .650"

**3-OPTION:**



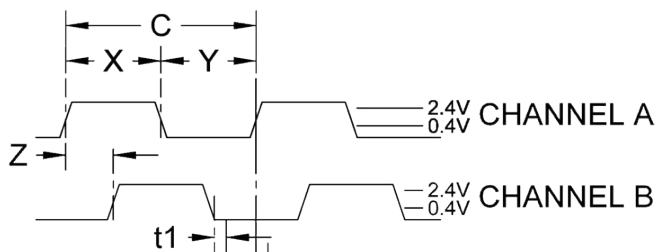
**T-OPTION:**



Note: All Dimensions are in (in)

Base Options:	Description
3 - Option	Makes all five hole diameters 0.125".
M - Option	Adds 4-hole mounting adapter plate. Mounting plates requires additional .125" shaft length. A .5" diameter hole is provided for shafts ≤ 10mm and a 1.5" diameter hole is provided for shafts > 10mm.
T - Option	A pre-applied transfer adhesive .005" thick (with peel-off backing) is available for "stick" on mounting

**SINGLE-END ENCODER TIMING DIAGRAMS**



ROTATION:  
CW - A LEADS B, CCW - B LEADS A

**SINGLE-ENDED ENCODER PINOUT**  
TOP OF ENCODER FACING PLUG

Pin #	Function
1	Ground
2	No Connection
3	Channel A
4	+5VDC Input
5	Channel B

Model #	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)

Timing Characteristics	Symbol	Min	Typ	Max	Units
Cycle Error	C	-	3.0	5.5	°e
Symmetry	X,Y	150	180	210	°e
Quadrature	Z	60	90	120	°e
Index Pulse Width	Po	60	90	120	°e
Ch. I Rise After Ch. B or Ch. A Fall	t1	10	100	250	ns
Ch. I Fall After Ch. B or Ch. A Rise	t2	70	150	300	ns

Parameter	Max	Units
Vibration (5 to 2kHz)	20	g
Shaft Axial Play	+/- 0.01	in.
Shaft Eccentricity Plus Radial Play	0.004	in.
Acceleration	250,000	rad/sec <sup>2</sup>

Parameter	Min	Typ	Max	Units
<b>Supply Current</b>				
CPR < 1000, no load	-	27	30	mA
CPR ≥ 1000, no load	-	55	57	mA
<b>Output Low</b> (I <sub>OL</sub> = 8mA max)	-	-	0.5	Volts
<b>Output High*</b>				
I <sub>OL</sub> = -8mA max	2.0	-	-	Volts
no load	4.2	4.8	-	Volts
<b>Output Current Per Channel</b>	-8.0	-	8.0	mA
<b>Output Rise Time</b>		110		nS
<b>Output Fall Time</b>		35		nS

\* Unloaded high level output voltage is 4.80V typically, 4.2V minimum.

Recommended Operating Conditions	Min	Max	Units
Temperature	-40	100	°C
Supply Voltage	4.5	5.5	Volts
Load Capacitance	-	100	pF
Count Frequency	-	100	kHz

## Cables:

The following cables are compatible with Anaheim Automation's A31 series encoder. Select a cable length from the table below:

Cable Part Number	Length
CBL-AA4032	1 ft.
CBL-AA4032-04	4 ft.
CBL-AA4032-10	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		
079=2mm	250=1/4"	551=14mm
118=3mm	313=5/15"	625=5/8"
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