Model 121

Patent #6,608,300B2

Features

- **Simple, Hassle Free Mounting**
- **Accepts Larger Shafts up to 5/8" (or 15 mm)**
- **Up to 12 Pole Commutation Available**
- **0° to 100° C Operating Temperature Available**
- **Patented Design**
- **Includes New IP50 Dust Seal Kit**

AT LAST! A reliable modular encoder that requires no calibration, gapping, or special tools to install! EPC has taken the performance of modular encoders to a new level with the Model 121 Auto-Aligning Modular Encoder. This new and innovative design provides simple, reliable, hassle free installation. Simply tighten the shaft clamp, install the mounting screws, and you're done!

The Model 121 incorporates the latest Optical ASIC technology for greatly enhanced performance. Common problems with other modular encoder designs are warping and deflection, caused by their extensive use of plastic, both of which are virtually eliminated by the Model 121's all metal construction. For brushless servo motor applications, the Model 121 can be specified with three commutation tracks to provide motor feedback. The optional 100° C temperature capability allows servo motors to operate at higher power outputs and duty cycles.

Common Applications

Servo Motor Control, Robotics, Specialty Assembly Machines, Digital Plotters, High Power Motors

Model 121 Ordering Guide

Blue type indicates price adder options. Not all configuration combinations may be available. Contact Customer Service for details.

121 - N - A - 5 - 01 - S - 0256 - Q - OC - 1 - S - N

MODEL
121 Auto-Aligning Modular Thru-Bore

COMMUTATION[1]
N No Commutation
C4 4 Pole
C6 6 Pole
C8 8 Pole
C12 12 Pole

MOUNTING & HOUSING STYLE
A Mounting Style A

INPUT VOLTAGE
5 5 VDC
12 12 VDC

BORE SIZE[2]
01 1/4", 0.250"
03 5/16", 0.3125"
02 3/8", 0.375"
10 1/2", 0.500"
11 5/8", 0.625"
06 5 mm
04 6 mm
14 8 mm
05 10 mm
12 12 mm
13 14 mm
15 15 mm

OPERATING TEMPERATURE
S 0° to 70° C
H 0° to 100° C

CYCLES PER REVOLUTION
See *CPR Options* below
Price adder >1999

NUMBER OF CHANNELS[4]

Channel A Leads B
Q Quadrature A & B
R Quadrature A & B with Index

Channel B Leads A
K Reverse Quadrature A & B
D Reverse Quadrature A & B with Index

See http://www.encoder.com/literature/index-phasing.pdf for additional options, and waveforms.

OUTPUT TYPE
OC Open Collector
PP Push-Pull
HV Line Driver

MAXIMUM FREQUENCY
1 100 kHz
2 200 kHz
3 300 kHz[3]

CONNECTOR TYPE
S 18" Cable[5]

CERTIFICATION
N None
CE CE Marked[6]

For specification assistance call Customer Service at 1-800-366-5412

Model 121 CPR Options

0200	0250	0254	0256	0300	0360	0500
0512	0600	0720	0800	0840	1000	1024
1200	1250	1800*	2000*	2048*	2500*	2540*

*Contact Customer service for application analysis

New CPR values are periodically added to those listed. Contact Customer Service to determine all currently available values. Special disk resolutions are available upon request and may be subject to a one-time NRE fee.

NOTES:

1. Not available in all configurations. Contact Customer Service for availability.
2. Contact Customer Service for additional options not shown.
3. Standard 0° to 70° C operating temperature only.
4. Contact Customer Service for non-standard index gating options.
5. For Non-Standard Cable Lengths add a forward slash (/) plus cable length expressed in feet. Example: S/6 = 6 feet of cable.
6. Please refer to **Technical Bulletin TB100:** ***When to Choose the CE Option*** at www.encoder.com.

ENCODER PRODUCTS COMPANY

Model 121 Specifications

Electrical

Input Voltage	5 VDC ±10% Fixed Voltage 12 VDC ±10% Fixed Voltage
Input Current	100 mA maximum with no output load
Output Format	Incremental- Two square waves in quadrature with channel A leading B for clockwise shaft rotation, as viewed from the mounting face. Index optional
Output Types	Open Collector- 20 mA per channel max Push-Pull- 20 mA per channel max Line Driver- 20 mA max per channel (Meets RS 422 at 5 VDC supply)
Index	Once per revolution gated to channel A. Contact Customer Service for additional gating options.
Max Frequency	100 kHz standard, 200 kHz, and 300 kHz optional
Symmetry	180° (±18°) electrical at 100 kHz
Quad. Phasing	90° (±22.5°) electrical at 100 kHz
Min. Edge Sep	67.5° electrical at 100 kHz
Accuracy	Within 0.1° mechanical from one cycle to any other cycle, or 6 arc minutes
Commutation	Optional- three 120° electrical phase tracks for commutation feedback. (4, 6, 8, or 12 poles. Others available upon request)
Comm. Accuracy	1° mechanical

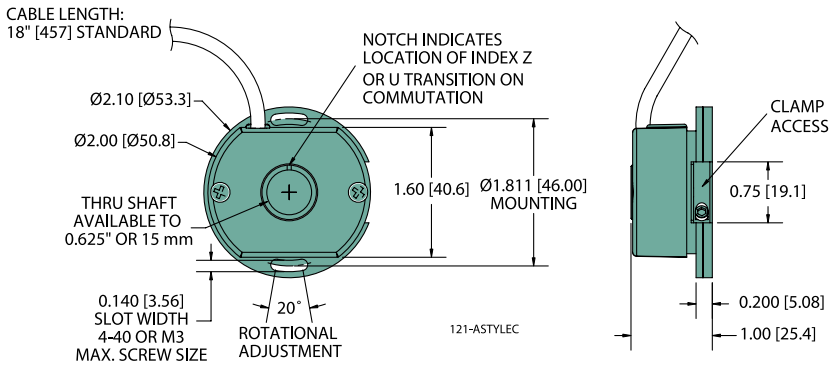
Mechanical

Max. Shaft Speed	Determined by maximum frequency response
Bore Size	0.250" through 0.625" 5 mm through 15 mm
Bore Tolerance	+0.0007" (max) -0.0000" (Based on H7 bore fit for g6 shaft Class LC5 per ANSI B-4.1 standard)
User Shaft Tolerance	
Radial Runout	0.002" max
Axial End Play	±0.015" for CPR <= 512 ±0.010" for CPR 513 to 1250 ±0.005" for CPR > 1250
Moment of Inertia	2.5 x 10^{-4} oz-in-sec^2
Max. Acceleration	5 x 10^5 rad/sec^2
Electrical Conn	18" cable (foil and braid shield, 24 AWG conductors non-commutated, 28 AWG commutated)
Housing	All Metal Aluminum and Zinc Alloy
Mounting	Two screws on a 1.812" Dia. B.C. (4-40 or M3 maximum screw size)
Weight	4 oz typical

Environmental

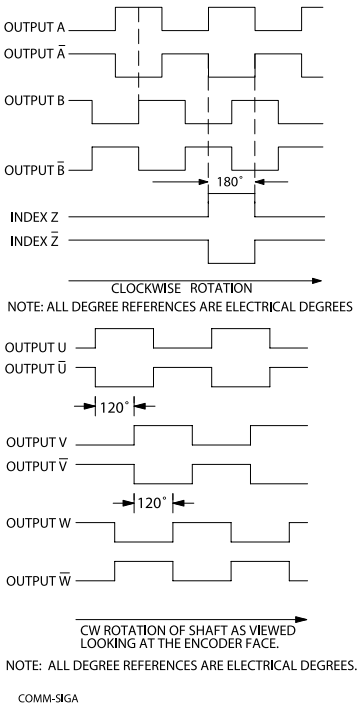
Operating Temp	0° to 70° C for standard models 0° to 100° C for high temperature option
Storage Temp	-25° to +100° C
Humidity	98% RH non-condensing
Vibration	10 g @ 58 to 500 Hz
Shock	50 g @ 11 ms duration

Model 121 Auto-Aligning Modular (A)



All dimensions are in inches with a tolerance of ±0.005" or ±0.01" unless otherwise specified
Metric dimensions are given in brackets [mm]

Waveform Diagrams



NOTE: ALL DEGREE REFERENCES ARE ELECTRICAL DEGREES

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COMM-SIGA

Wiring Table

Function	Cable Wire Color
Com	Black
+VDC	White
A	Brown
A'	Yellow
B	Red
B'	Green
Z	Orange
Z'	Blue
U	Violet
U'	Gray
V	Pink
V'	Tan
W	Red/Green
W'	Red/Yellow
Shield	Bare *

*CE Option: Cable shield (bare wire) is connected to internal case