

# MODEL 121 - INCREMENTAL ENCODER



Ø2.1"  
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

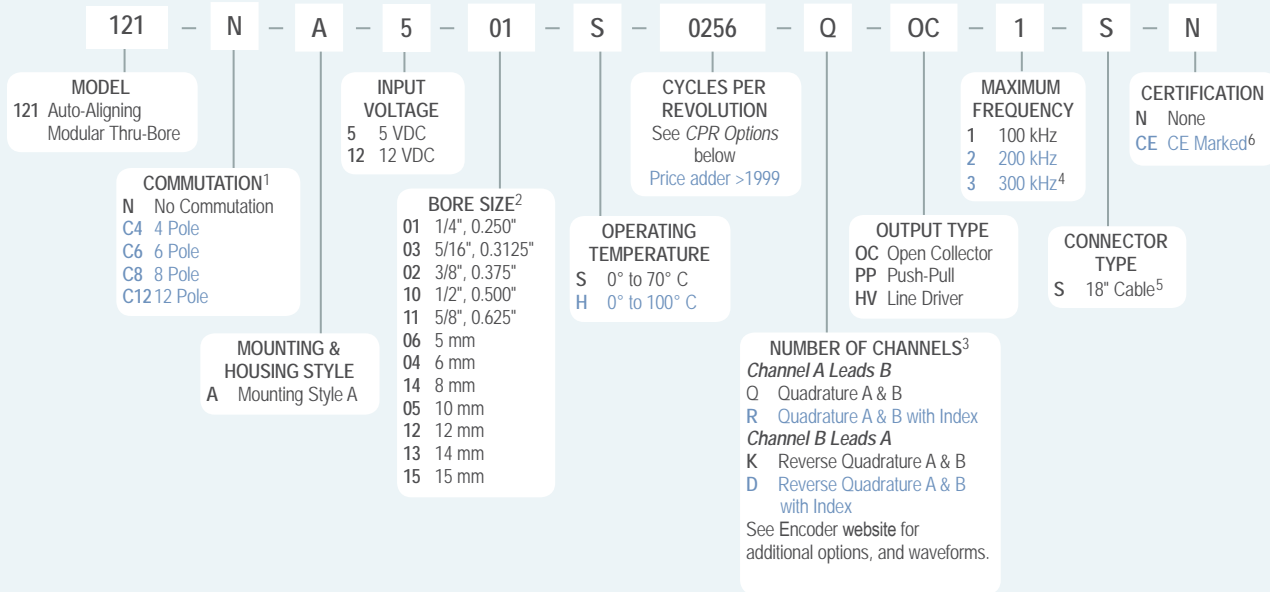
EPC has taken the performance of modular encoders to a new level with the Model 121 Auto-Aligning Modular Encoder. This new and innovative design requires no calibration, gapping or special tools for hassle-free installation. The Model 121 incorporates the latest Optical ASIC technology for enhanced 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.



### MODEL 121 CPR OPTIONS

0200 0250 0254 0256 0300 0360 0500 0512  
0600 0720 0800 0840 1000 1024 1200 1250  
1500 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:

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

## 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

Quadrature..... 67.5° electrical or better is typical, 54°

Edge Separation ..... electrical minimum at temperatures > 99° C

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 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<sup>-4</sup> oz-in-sec<sup>2</sup>

Max. Acceleration ... 5 x 10<sup>5</sup> rad/sec<sup>2</sup>

Housing ..... All Metal Aluminum and Zinc Alloy

Weight..... 4 oz typical

### Environmental

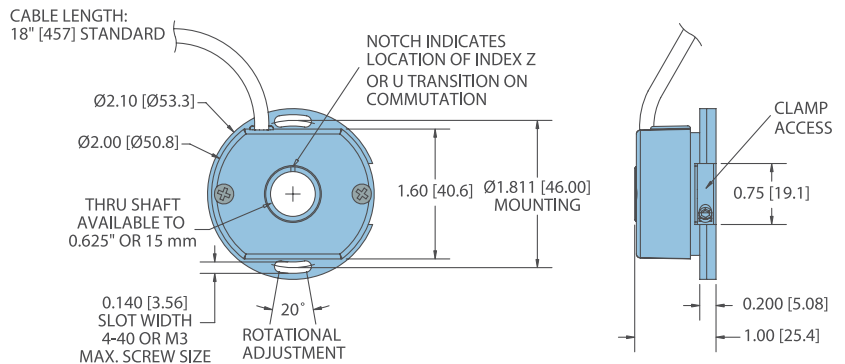
Storage Temp ..... -25° to +100° C

Humidity..... 98% RH non-condensing

Vibration..... 10 g @ 58 to 500 Hz

Shock..... 50 g @ 11 ms duration

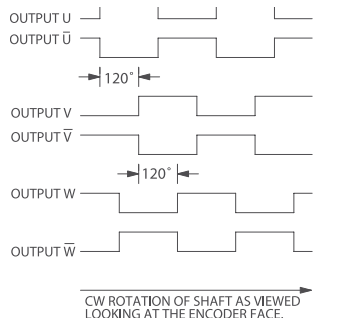
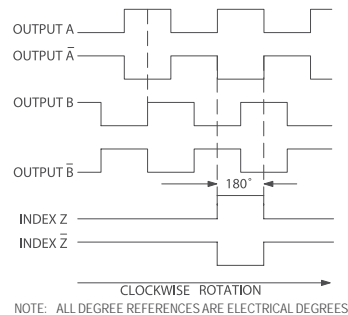
## MODEL 121 AUTO-ALIGNING MODULAR (A)



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



## WIRING TABLE

Function	Cable <sup>†</sup> 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.

<sup>†</sup>Standard cable for non-commutated models is 24 AWG. For commutated units, conductors are 28 AWG.