

# Model 121 Auto-Aligning Modular



# Principle Engineering



## Features

- Simple, Hassle Free Mounting
- Accepts Larger Shafts up to 15 mm
- Up to 12 Pole Commutation Available
- 0° to 100° C Operating Temperature Available
- Patented Design - #6,608,300B2
- Includes New IP50 Dust Seal Kit

AT LAST! A reliable modular encoder that requires no calibration, gapping, or special tools to install! We have 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!

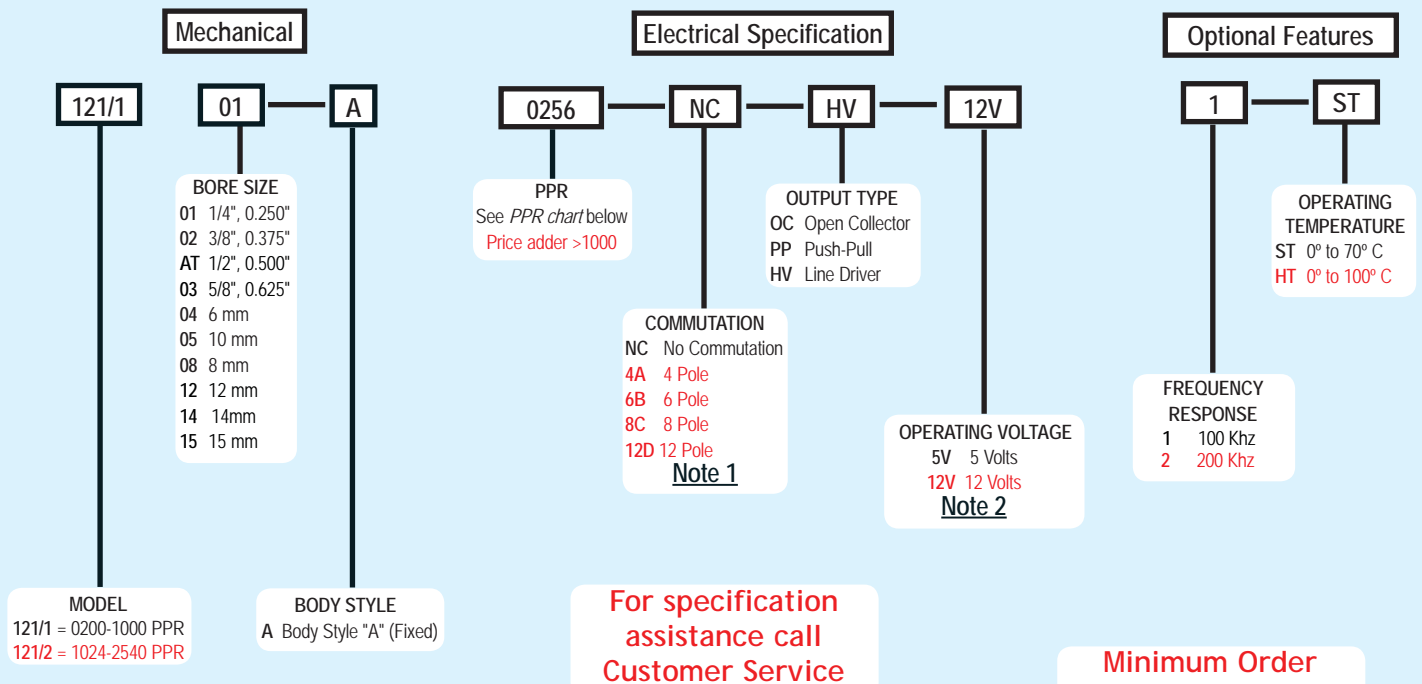
The Model 121 incorporates the latest Optical ASIC technology for greatly enhanced performance. Common problems with other modular encoder designs are warping and deflection, caused by their extensive use of plastic, both of which are virtually eliminated by the Model 121's all metal construction. For 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, Speciality Assembly Machines, Digital Plotters, High Power Motors

## Model 121 Ordering Guide

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



**Minimum Order  
Quantity  
5 Units  
Lead Time 14 Days**

## Model 121 PPR 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 PPR 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 Please note - Fixed operating voltages, please specify

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## Model 121 Specifications

### Electrical

Input Voltage.....	5 Vcc $\pm 10\%$ Fixed Voltage
	12 Vcc $\pm 10\%$ 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.
Freq. Response.....	100 kHz standard, 200 kHz
Symmetry .....	180° ( $\pm 18^\circ$ ) electrical at 100 kHz
Quad. Phasing.....	90° ( $\pm 22.5^\circ$ ) 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

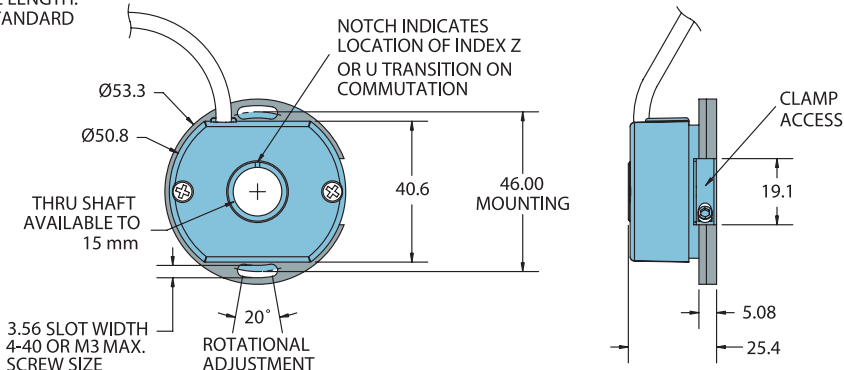
Max. Shaft Speed.....	Determined by maximum frequency response
Bore Size .....	6mm through 15mm
Bore Tolerance .....	H7 bore fit for g6 shaft Class LC5
User Shaft Tolerance	
Radial Runout.....	0.05mm max
Axial End Play.....	$\pm 0.40$ for PPR $\leq 512$ $\pm 0.250$ for PPR 513 to 1250 $\pm 0.125$ for PPR $> 1250$
Max. Acceleration.....	$5 \times 10^5$ rad/sec <sup>2</sup>
Electrical Conn .....	0.5 Metre 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 46mm PCD. (M3 maximum screw size)
Weight.....	150 gms typical

### Environmental

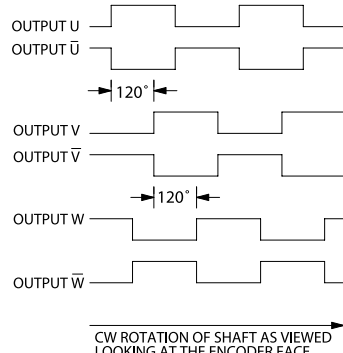
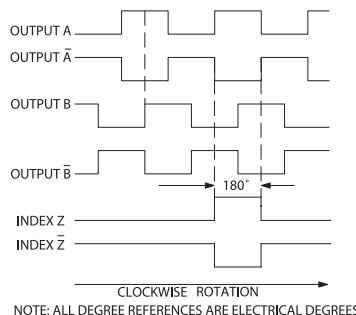
Operating Temp.....	0° to 70° C for standard models 0° to 100° C for high temperature option
Storage Temp.....	-25° to +100° C
Humidity.....	98% RH non-condensing
Vibration.....	10 g @ 58 to 500 Hz
Shock.....	50 g @ 11 ms duration

## Model 121 Auto-Aligning Modular

CABLE LENGTH:  
2 M STANDARD



### Waveform Diagrams



### Wiring Table

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