

MODEL 121 - THRU-BORE MODULAR 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 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 Opto-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.

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

MODEL 121 Auto-aligning modular thru-bore	MOUNTING & HOUSING STYLE A Mounting Style A	BORE SIZE² 01 1/4", 0.250" 03 5/16", 0.3125" 02 3/8", 0.375" 99 0.497" 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	NUMBER OF CHANNELS³ <i>Channel A Leads B</i> Q Quadrature A & B R Quadrature A & B with index <i>Channel B Leads A</i> K Reverse Quadrature A & B D Reverse Quadrature A & B with index See our PDF Quadrature Phasing and Index Gating Options for additional options and waveforms.	CONNECTOR TYPE S 18" Cable ⁵	COMMUTATION¹ N No commutation C4 4 pole C6 6 pole C8 8 pole C12 12 pole	INPUT VOLTAGE 5 5VDC	OPERATING TEMPERATURE S 0° to 70° C H 0° to 100° C	CYCLES PER REVOLUTION See <i>CPR Options</i> below Price adder > 1999	OUTPUT TYPE OC Open Collector PP Push-Pull HV Line Driver	MAXIMUM FREQUENCY 1 100 kHz 2 200 kHz 3 300 kHz ⁴	CERTIFICATION N None CE CE marked ⁶
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MODEL 121 CPR OPTIONS

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

*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 Mark](#) at encoder.com.

MODEL 121 - THRU-BORE MODULAR ENCODER

MODEL 121 SPECIFICATIONS

Electrical

Input Voltage.....5 VDC +10% Fixed Voltage

Input Current.....130 mA max (< 100 mA typical) 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 TypesOpen 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)

IndexOnce per revolution gated to channel A. Contact Customer Service for additional gating options.

Max Frequency100 kHz standard, 200 kHz, and 300 kHz optional

Electrical Protection.....Reverse voltage and output short circuit protected. NOTE: Sustained reverse voltage may result in permanent damage.

Quadrature Edge Separation...67.5° electrical or better is typical, 54° electrical minimum at temperatures > 99° C

Accuracy.....Within 0.1° mechanical from one cycle to any other cycle, or 6 arc minutes

CommutationOptional – three 120° electrical phase tracks for commutation

feedback. (4, 6, 8, or 12 poles. Others available upon request.)

Comm. Accuracy1° 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 Runout0.002" max

Axial End Play±0.015" for CPR ≤ 512
±0.010" for CPR 513 to 1250
±0.005" for CPR > 1250

Moment of Inertia2.5 x 10⁻⁴ oz-in-sec²

Max. Acceleration5 x 10⁵ rad/sec²

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

Weight4 oz typical

Environmental

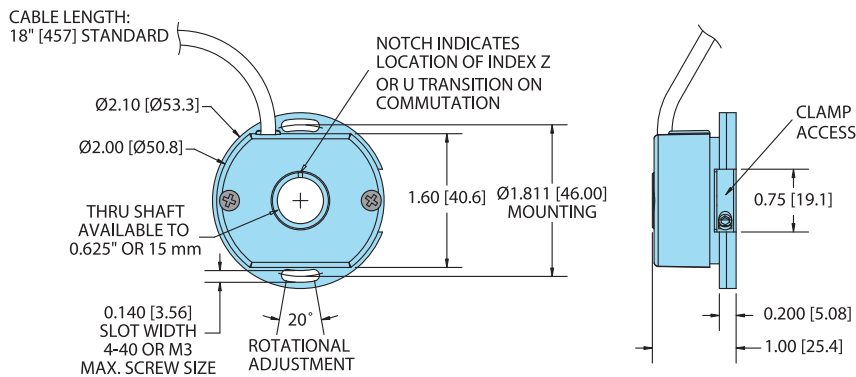
Storage Temp.....-25° to 100° C

Humidity98% RH non-condensing

Vibration10 g @ 58 to 500 Hz

Shock50 g @ 11 ms duration

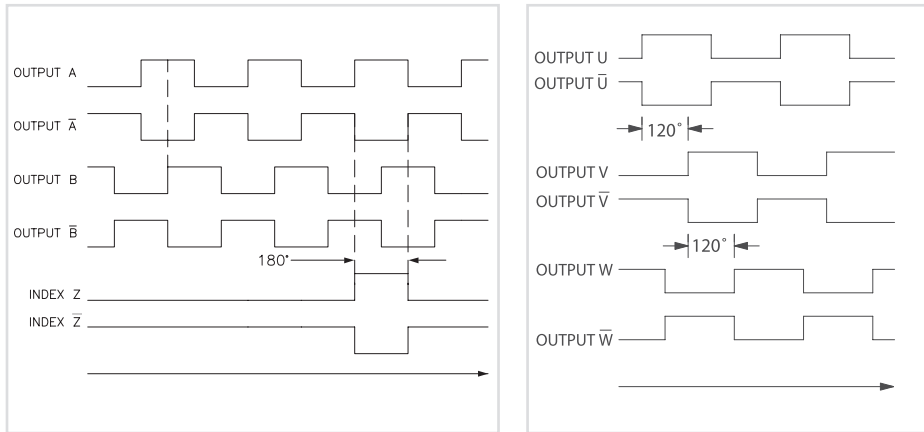
MODEL 121 AUTO-ALIGNING MODULAR (A)



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

MODEL 121 - THRU-BORE MODULAR ENCODER

WAVEFORM DIAGRAMS



Clockwise rotation as viewed from the mounting face

NOTE: All degree references are electrical degrees.

Waveform shown with optional complementary signals A, B, Z for HV output only

WIRING TABLE

For EPC-supplied mating cables, refer to wiring table provided with cable. Trim back and insulate unused wires.

Function	Flying Leads 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.

[†]Standard cable for non-commutated models is 24 AWG
For commutated units, conductors are 28 AWG.