

# MODEL 260 – INCREMENTAL ENCODER



Ø2.0"

## FEATURES

- Low Profile 1.19"
- Up to 12 Pole Commutation
- Thru-Bore and Hollow Bore (Blind) Styles
- Simple, Innovative Flexible Mounting System
- Incorporates Opto-ASIC Technology
- CE Marking Available

With a bore up to 0.625" and a low profile, the Model 260 Accu-Coder™ is the perfect solution for many machine and motor applications. Available in both hollow bore and a complete thru-bore, the Model 260 uses EPC's innovative anti-backlash mounting system, allowing simple, reliable, and precise encoder attachment. Unlike traditional kit or modular encoder designs, its integral bearing set provides stable and consistent operation without concerns for axial or radial shaft runout. For brushless servo motor applications, the Model 260 can be specified with three 120° electrical phase tracks to provide up to 12 pole commutation feedback. The optional extended temperature capability allows servo motors to operate at higher power outputs and duty cycles. And of course, the Model 260 uses EPC's pioneering Opto-ASIC design, so you'll always get a clean, reliable signal.

## COMMON APPLICATIONS

Brushless Servo Motor Commutation, Robotics, Motor-Mounted Feedback, Assembly Machines, Digital Plotters, High Power Motors

## MODEL 260 ORDERING GUIDE

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

<b>260</b>	<b>N</b>	<b>T</b>	<b>01</b>	<b>S</b>	<b>0256</b>	<b>Q</b>	<b>OC</b>	<b>1</b>	<b>S</b>	<b>SF</b>	<b>1</b>	<b>N</b>	
<b>MODEL</b> 260 Ultra Versatile Commutated Thru-Bore			<b>BORE SIZE<sup>2</sup></b> 01 1/4", 0.250" 02 3/8", 0.375" 76 7/16", 0.4375" 10 1/2", 0.500" 11 5/8", 0.625" 06 5 mm 04 6 mm 14 8 mm 05 10 mm 09 11 mm 12 12 mm 13 14 mm 15 15 mm		<b>CYCLES PER REVOLUTION</b> 1-10,000 See <i>CPR Options</i> below Price adder > 1999		<b>OUTPUT TYPE</b> OC Open Collector PP Push-Pull HV Line Driver <sup>5</sup> OD Open Collector with Differential Outputs		<b>CONNECTOR<sup>6</sup> TYPE</b> <b>S</b> 18" Cable <sup>7</sup> <b>J00</b> 18" Cable with 5-pin M12 <sup>8</sup> <b>K00</b> 18" Cable with 8-pin M12 <sup>8</sup> <b>SMJ</b> 5-pin Body Mount M12 <sup>5,8</sup> <b>SMK</b> 8-pin Body Mount M12 <sup>8</sup> <b>SMH</b> 10-pin Body <sup>9</sup> Mount Bayonet		<b>CERTIFICATION</b> N None CE CE Marked <sup>10</sup>		
	<b>COMMUTATION<sup>1</sup></b> N No Commutation C4 4 Pole C6 6 Pole C8 8 Pole C10 10 Pole C12 12 Pole				<b>NUMBER OF CHANNELS<sup>4</sup></b> <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 <a href="http://www.encoder.com/literature/index-phasing.pdf">http://www.encoder.com/literature/index-phasing.pdf</a> for additional options, and waveforms.			<b>MAXIMUM FREQUENCY</b> 1 Standard 2 Extended See specifications for explanation.		<b>SEALING</b> 1 IP50 for Thru-Bore 2 IP64 for Thru-Bore 3 IP64 for Hollow Bore 4 IP50 for Hollow Bore		<b>MOUNTING</b> SD 1.575" (40 mm) BC Flex Mount SF 1.811" (46 mm) BC Flex Mount SL 2.36" (60 mm) BC Flex Mount XF 2.250" BC 3-point Flex Mount NF 2.375" BC 3-point Flex Mount FA 1.06" to 1.81" BC Flex Arm FB 1.50" to 3.13" BC Flex Arm	
	<b>HOUSING STYLE</b> B Hollow Bore (Blind) T Front Clamp Thru-Bore R Rear Clamp Thru-Bore		<b>OPERATING TEMPERATURE<sup>3</sup></b> L -40° to 70° C S 0° to 70° C H 0° to 100° C V 0° to 120° C <sup>8</sup>										

### MODEL 260 CPR OPTIONS

0001 thru 0189*	0200	0250	0254	0256
0300	0360	0400*	0500	0512
0720	0800	0840	1000	1024
1220	1250	1270	1500	1800
2048	2500	2540	3000	3600
4096	5000	6000	7200	8192
				10,000

\*Contact Customer Service for availability.

Contact Customer Service for other disk resolutions. Not all disk resolutions available with every commutation option.

### NOTES:

- Not available in all configurations. Contact Customer Service for availability.
- Contact Customer Service for additional options not shown.
- 5 to 16 VDC supply only for H option; 5 VDC supply only for V option. Contact Customer Service for availability and additional information.
- Contact Customer Service for non-standard index gating options.
- Line Driver not available with 5-pin Body Mount M12 connector type.
- For mating connectors, cables, and cordsets see Accessories or visit [www.encoder.com](http://www.encoder.com). For Pin Configuration Diagrams, see Technical Information or visit [www.encoder.com](http://www.encoder.com).
- For non-standard cable lengths add a forward slash (/) plus cable length expressed in feet. Example: S/6 = 6 feet of cable. Frequency above 300 kHz standard cable lengths only.
- 8-pin Body Mount M12 Connector Type not available with commutation or with V temperature option. Additional cable lengths available. Please consult Customer Service.
- Not available with commutation.
- Please refer to Technical Bulletin **TB100: When to Choose the CE Mark** at [www.encoder.com](http://www.encoder.com).

## MODEL 260 SPECIFICATIONS

### Electrical

Input Voltage..... 4.75 to 28 VDC for temperatures up to 70° C  
5 to 16 VDC for 0° to 100° C operating temperature  
5 VDC for 0° to 120° C operating temperature

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.  
See *Waveform Diagrams*.

Output Types..... Open Collector – 20 mA max per channel  
Push-Pull – 20 mA max per channel  
Line Driver – 20 mA max per channel (Meets RS 422 at 5 VDC supply)

Index..... Once per revolution gated to channel A. See *Waveform Diagrams*.

Max. Frequency ..... Standard Frequency Response is 200 kHz for CPR 1 to 2540  
500 kHz for CPR 2541 to 5000  
1 MHz for CPR 5001 to 10,000  
Extended Frequency Response (optional) is 300 kHz for CPR 2000, 2048, 2500, and 2540

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

Noise Immunity..... Tested to BS EN61000-6-2; BS EN50081-2; BS EN61000-4-2; BS EN61000-4-3; BS EN61000-4-6, BS EN55011

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

Edge Separation..... 54° electrical minimum at temperatures > 99° C

Accuracy..... Within 0.01° mechanical from one cycle to any other cycle, or 0.6 arc minutes.

Commutation..... Up to 12 pole. Contact Customer Service for availability.

Comm. Accuracy..... 1° mechanical.

### Mechanical

Max Shaft Speed..... 7500 RPM. Higher shaft speeds may be achievable, contact Customer Service. Note: For extreme temperature operation, de-rate temperature by 5° C for every 1000 RPM above 3000 RPM.

Bore Tolerance..... -0.0000" / +0.0006"

User Shaft Tolerances  
Radial Runout ..... 0.007" max  
Axial Endplay..... ±0.030" max

Starting Torque ..... IP50 Thru-Bore: 0.50 oz-in  
IP50 Hollow Bore: 0.30 oz-in  
IP64 Thru-Bore: 2.50 oz-in  
IP64 Hollow Bore: 2.0 oz-in  
Note: Add 3.0 oz-in for -40° C operation

Moment of Inertia ... 3.9 x 10<sup>-4</sup> oz-in-sec<sup>2</sup>

Housing ..... Non-corrosive material

Weight..... 3.5 oz typical

### Environmental

Storage Temp ..... -40° to 100° C

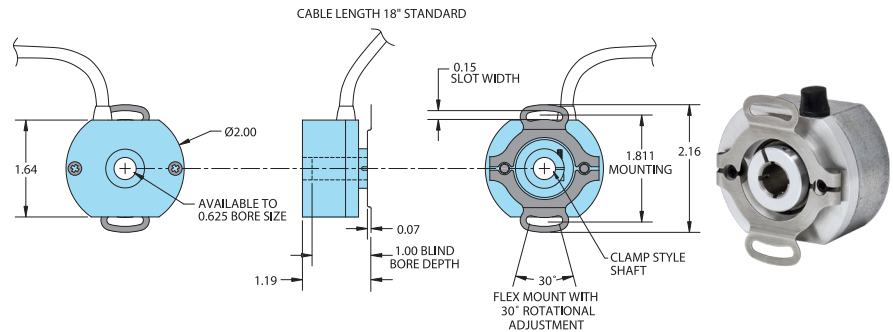
Humidity..... 98% RH non-condensing

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

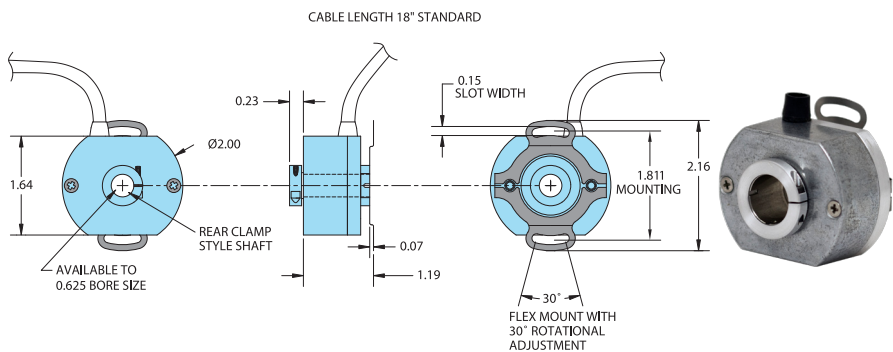
Shock..... 50 g @ 11 ms duration

Sealing..... IP50; IP64 available

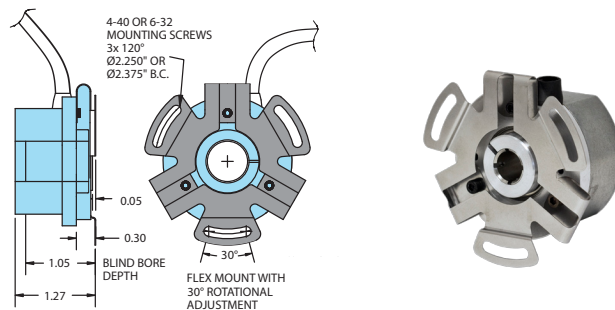
## MODEL 260 WITH FRONT SHAFT CLAMP (T) WITH 1.811" (46 MM) BC SLOTTED FLEX (SF)



## MODEL 260 REAR CLAMP (R) WITH 1.811" (46 MM) BC SLOTTED FLEX (SF)

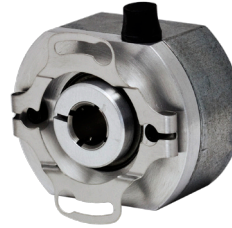
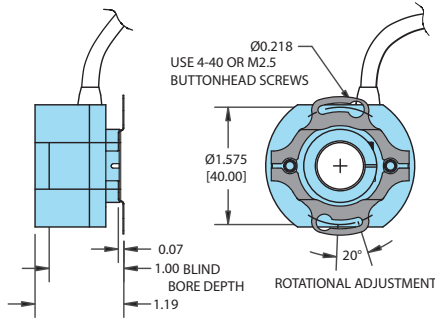


## THREE POINT FLEX MOUNT (XF, NF)

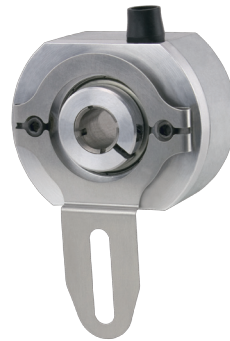
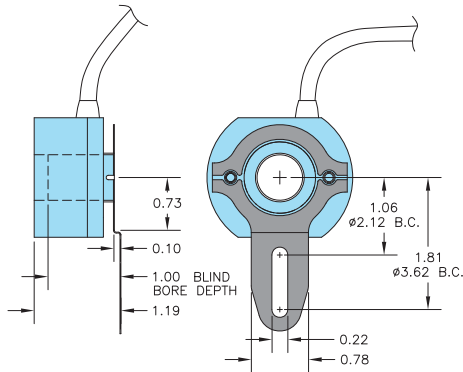


All dimensions are in inches with a tolerance of ±0.005" or ±0.01" unless otherwise specified.

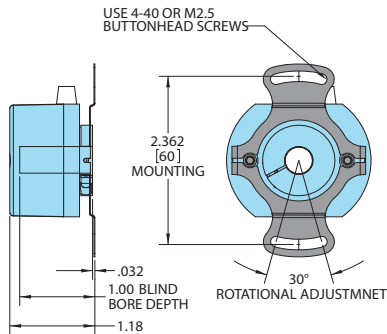
### 1.575" (40 MM) BC FLEX MOUNT (SD)



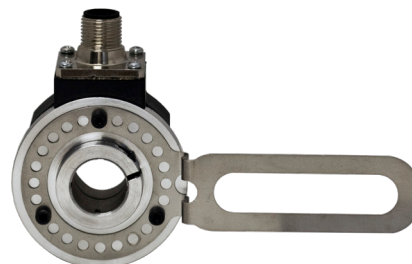
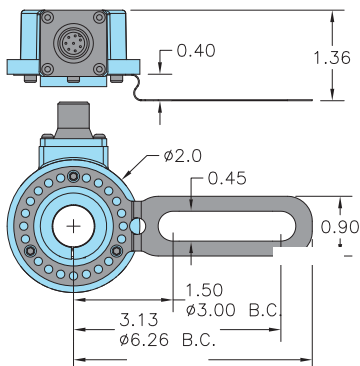
### 1.06" TO 1.81" FLEX ARM (FA)



### 2.36" (60 MM) BC FLEX MOUNT (SL)



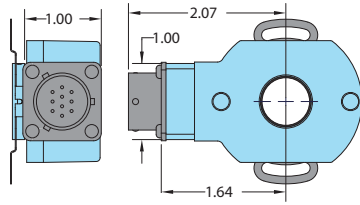
### 1.50" TO 3.13" FLEX ARM (FB)



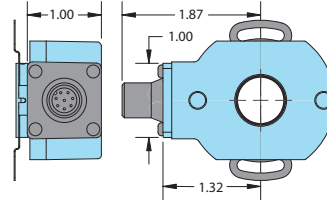
All dimensions are in inches with a tolerance of  $\pm 0.005$ " or  $\pm 0.01$ " unless otherwise specified.

## MODEL 260 CONNECTOR OPTIONS

### BODY MOUNT 10-PIN BAYONET (SMH)

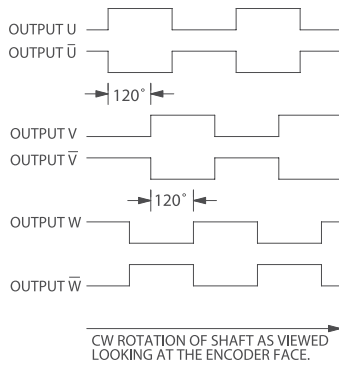
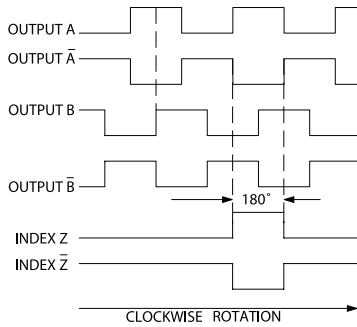


### BODY MOUNT M12 (SMJ, SMK)



All dimensions are in inches with a tolerance of  $\pm 0.005''$  or  $\pm 0.01''$  unless otherwise specified.

### WAVEFORM DIAGRAMS



NOTE: ALL DEGREE REFERENCES ARE ELECTRICAL DEGREES. WAVEFORM SHOWN WITH OPTIONAL COMPLEMENTARY SIGNALS  $\bar{A}$ ,  $\bar{B}$ ,  $\bar{Z}$  FOR HV AND OD OUTPUTS ONLY.

### WIRING TABLE

For EPC-supplied mating cables, refer to wiring table provided with cable.

Function	Flying Leads Cable <sup>†</sup> Wire Colors	5-pin M12 <sup>**</sup>	8-pin M12 <sup>**</sup>	10-pin Bayonet <sup>†</sup>
Com	Black	3	7	F
+VDC	White	1	2	D
A	Brown	4	1	A
A'	Yellow	--	3	H
B	Red	2	4	B
B'	Green	--	5	J
Z	Orange	5	6	C
Z'	Blue	--	8	K
U	Violet	--	--	--
U'	Gray	--	--	--
V	Pink	--	--	--
V'	Tan	--	--	--
W	Red/Green	--	--	--
W'	Red/Yellow	--	--	--
Shield	Bare*	--	--	--

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

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

\*\*CE Option: Use cable cordset with shield connected to M12 connector coupling nut.

\*CE Option: Pin G is connected to internal case.