EN - Rotary Optical Encoder

**Features**
- Two channel quadrature output
- Bushing or servo mount
- Square wave signal
- Small size
- Resolution to 256 PPR
- CMOS and TTL compatible
- Long life
- Ball bearing option for high operating speed up to 3000 rpm
- RoHS compliant*

**Electrical Characteristics**
- Output: 2-bit quadrature code, Channel A leads Channel B by 90° (electrical) with clockwise rotation
- Resolution: 25 to 256 cycles per revolution
- Insulation Resistance (500 VDC): 1,000 megohms
- Electrical Travel: Continuous
- Supply Voltage: 5.0 VDC ±0.25 VDC
- Supply Current: 26 mA maximum
- Output Voltage: Low Output: 0.8 V maximum
- High Output: 4 V minimum
- Output Current: Low Output: 25 mA minimum
- Rise/Fall Time: 200 ns (typical)
- Shaft RPM (Ball Bearing): 3,000 rpm maximum
- Power Consumption: 136 mW maximum
- Pulse Width (Electrical Degrees, Each Channel): 180° ±45° typ.
- Pulse Width (Index Channel): 360° ±90°
- Phase (Electrical Degrees, Channel A to Channel B): 90° ±45° typ.

**Environmental Characteristics**
- Operating Temperature Range: -40°C to +75°C (-40°F to +167°F)
- Storage Temperature Range: -40°C to +85°C (-40°F to +185°F)
- Vibration: 0.5 G
- Shock: 50 G
- Rotational Life: 10,000,000 revolutions
- W, S & T Bushings (3,000 rpm maximum)**: 200,000,000 revolutions
- IP Rating: IP 40

**Mechanical Characteristics**
- Mechanical Angle: 360° Continuous
- Torque (Starting and Running): 1 N-cm (1.5 oz-in.) maximum
- Shaft End Play: 0.07 N-cm (0.1 oz-in.) maximum
- Mounting Torque: 1.7 to 2.0 N-m (15 to 18 lb-in.) maximum
- Shaft Radial Play: 0.30 mm (0.012”) T.I.R. maximum
- Weight: 11 gms. (0.4 oz.)
- Terminals: Axial or radial pc pins or ribbon cable
- Soldering Condition: Ball bearing or servo mount
- Washing processes: Not recommended
- Marking: Manufacturer’s trademark, name, part number, date code, and date code.

**Quadrature Output Table**

<table>
<thead>
<tr>
<th>OUTPUT VOLTAGE</th>
<th>STANDARD RESOLUTIONS AVAILABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel A</td>
<td>(Full quadrature output cycles per shaft revolution)</td>
</tr>
<tr>
<td></td>
<td>25°</td>
</tr>
<tr>
<td></td>
<td>50°</td>
</tr>
<tr>
<td></td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

* Channel B leads Channel A

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EN - Rotary Optical Encoder

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GENERAL INFORMATION
The Bourns® EN model is a self-contained rotary optical encoder. It produces a 2-bit quadrature signal which is suitable for digital systems where both magnitude and direction of adjustment must be provided. The EN encoder is ideal for use as a digital panel control or as a position sensing device in applications where long life, reliability, high resolution and precise linearity are critical.

The EN series encoder converts rotary input into electrical signals which can be used by microprocessors without A/D conversion.

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EN - Rotary Optical Encoder

How To Order

BOURNS EN SERIES OPTICAL ENCODER

- Code: ENC1J-D28-L00128L
- Anti-Rotation Lug Position: Code D = None, Code J = 9:00 Position, Code P = Rear Mounting Bracket
- RoHS Identifier: Code L = Compliant

SWITCHING CONFIGURATION
- Code 1: Channel A Leads, Channel B By 90° (Clockwise Rotation)**

TERMINAL*** CONFIGURATION
- Code L = Axial, Multi-Purpose Pin
- Code M = Axial, Ribbon & Connector 10°
- Code N = Radial, Ribbon & Connector 10°
- Code W = Axial, Ribbon 10° - No Connector
- Code Y = Radial, Ribbon 10° - No Connector

SHAFT STYLE
- Code B = 1/4˝ Dia., Plain End
- Code C = 1/8˝ Dia., Plain End
- Code D = 1/4˝ Dia., Single Flatted

Bushings Configuration
- Code A = 3/8˝ D X 3/8˝ L Threaded
- Code C = 1/4˝ D X 1/4˝ L Threaded
- Code S = 3/8˝ D X 3/8˝ L Threaded (Ball Bearing)
- Code T = 1/4˝ D X 3/8˝ L Threaded (Ball Bearing)
- Code W = Servo Mount 7/8˝ D (Ball Bearing)

RESOLUTION
- Code 00025 = 25 Cycles Per Revolution
- Code 00050 = 50 Cycles Per Revolution
- Code 00064 = 64 Cycles Per Revolution
- Code 00100 = 100 Cycles Per Revolution
- Code 00125 = 125 Cycles Per Revolution
- Code 00128 = 128 Cycles Per Revolution
- Code 00200 = 200**** Cycles Per Revolution
- Code 00256 = 256**** Cycles Per Revolution

Bourns encoder output signals are square wave digital pulses which do not require debounce circuitry. Both features make it possible to significantly reduce the memory overhead, wiring and wiring interconnects required by other types of control devices.

EN optical encoders offer a useful rotational life of from 10 million to 200 million shaft revolutions, making them ideal for extended service applications. The Bourns encoder is also compact and well suited for situations where the available space is limited.
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