



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*

EN - Rotary Optical Encoder

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) |
| Humidity | MIL-STD-202, Method 103B, Condition B |
| Vibration | 5 G |
| Shock | 50 G |
| Rotational Life | |
| A & C Bushings (300 rpm maximum)** | 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) | |
| A & C Bushings (Spring Loaded for Optimum Feel) | 1 N-cm (1.5 oz-in.) maximum |
| W, S & T Bushings (Ball Bearing Shaft Support) | 0.07 N-cm (0.1 oz-in.) maximum |
| Mounting Torque | 1.7 to 2.0 N-cm (15 to 18 lb.-in.) maximum |
| Shaft End Play | 0.30 mm (0.012") T.I.R. maximum |
| Shaft Radial Play | 0.12 mm (0.005") T.I.R. maximum |
| Weight | 11 gms. (0.4 oz.) |
| Terminals | Axial or radial pc pins or ribbon cable |
| Soldering Condition | |
| Manual Soldering | 96.5Sn/3.0Ag/0.5Cu solid wire or no-clean rosin cored wire 370 °C (700 °F) max. for 3 seconds |
| Wave Soldering | 96.5Sn/3.0Ag/0.5Cu solder with no-clean flux 260 °C (500 °F) max. for 5 seconds |
| Wash processes | Not recommended |
| Marking | Manufacturer's trademark, name, part number, and date code. |
| Hardware | One lockwasher and one mounting nut supplied with each encoder, except on servo mount versions. |

**For resolutions ≤ 128 quadrature cycles per shaft revolution.

Quadrature Output Table



STANDARD RESOLUTIONS AVAILABLE

| | |
|--|-----|
| (Full quadrature output cycles per shaft revolution) | |
| 25* | 125 |
| 50* | 128 |
| 64 | 200 |
| 100 | 256 |

For Non-Standard Resolutions—Consult Factory

* Channel B leads Channel A

EN - Rotary Optical Encoder

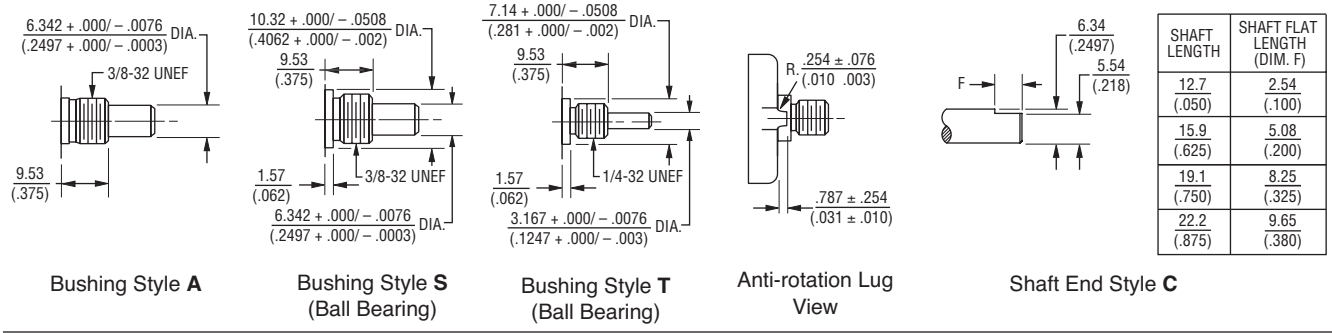
Dimensional Drawings



Consult factory for options not shown, including:

- Wire lead or cable options
- Connectors
- Non-standard resolutions
- Special shaft/bushing sizes and features
- Special performance characteristics
- PCB mounting bracket

Bushing Style C



Bushing Style A

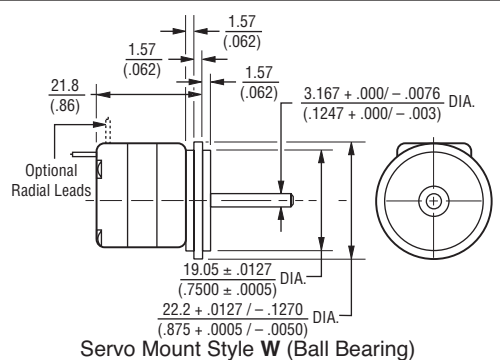
Bushing Style S (Ball Bearing)

Bushing Style T (Ball Bearing)

Anti-rotation Lug View

Shaft End Style C

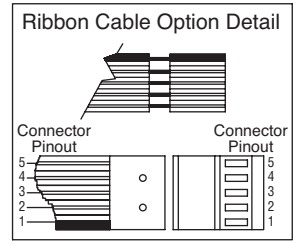
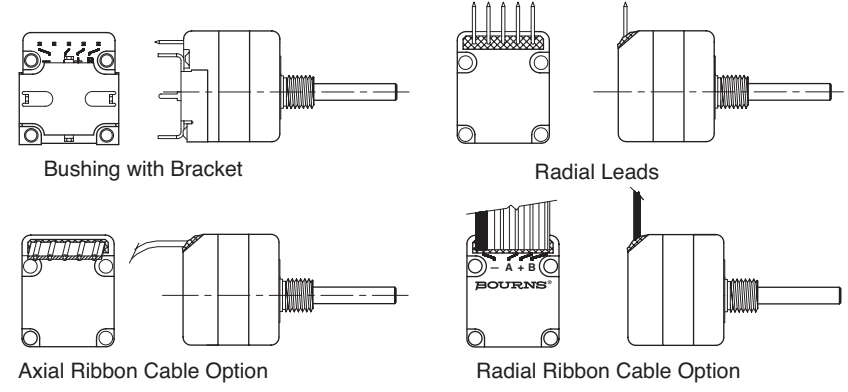
TERMINATION DIAGRAM



Servo Mount Style W (Ball Bearing)



Recommended Board Layout with Bracket



DIMENSIONS: $\frac{MM}{(INCHES)}$

Specifications are subject to change without notice. Customers should verify actual device performance in their specific applications.