



### Features

- Quadrature output
- Detent option
- Snap-in PC board mount
- Long operating life
- Incremental output
- Up to 24 full quadrature outputs per revolution

### Additional Information

Click these links for more information:



## ES Series - Shaftless Contacting Encoders

### Electrical Characteristics

Output.....	2-bit quadrature code, Channel A leads Channel B turning clockwise (CW)
Closed Circuit Resistance.....	5 ohms maximum
Open Circuit Resistance.....	100 K ohms minimum
Contact Rating.....	10 milliamp @ 10 VDC or 0.1 watt maximum
Insulation Resistance (500 VDC).....	1,000 megohms minimum
Dielectric Withstanding Voltage (MIL-STD-202 Method 301) Sea Level.....	1,000 VAC minimum
Electrical Travel.....	Continuous
Contact Bounce (15 RPM).....	5 milliseconds maximum
RPM (Operating).....	120 maximum

### Environmental Characteristics

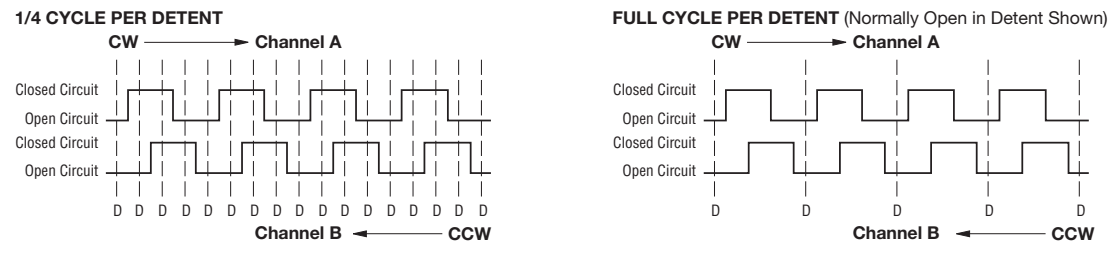
Operating Temperature Range.....	-40 °C to +85 °C (-40 °F to +185 °F)
Storage Temperature Range.....	-40 °C to +85 °C (-40 °F to +185 °F)
Humidity.....	MIL-STD-202, Method 103B, Condition B
Vibration.....	15 G
Contact Bounce.....	0.1 millisecond maximum
Shock.....	50 G
Contact Bounce.....	0.1 millisecond maximum
Rotational Life.....	200,000 shaft revolutions
IP Rating.....	IP 40

### Mechanical Characteristics

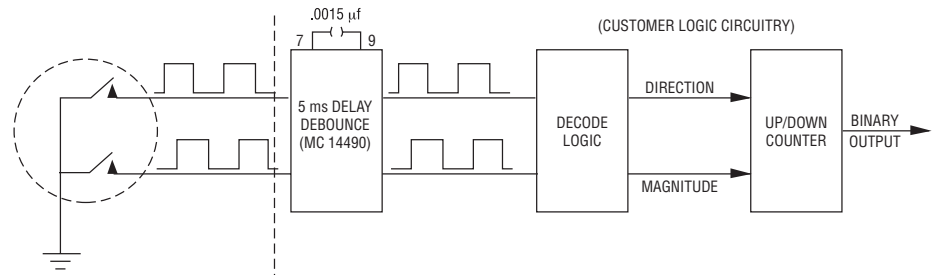
Mechanical Angle.....	Continuous
Running Torque (Detented).....	0.5 to 1.5 N-cm (0.75 to 2.25 oz-in.)
Undetented Torque.....	0.17 to 0.8 N-cm (0.25 to 1.25 oz-in.)
Weight.....	Approximately 8 gm (0.28 oz.)
Terminals.....	Printed circuit board terminals
Soldering Condition.....	96.5Sn/3.0Ag/0.5Cu solid wire or no-clean rosin cored wire; 370 °C (700 °F) max. for 3 seconds
Manual Soldering.....	96.5Sn/3.0Ag/0.5Cu solder with no-clean flux; 260 °C (500 °F) max. for 5 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 name and trademark, part number and date code
Hardware.....	No hardware supplied

### Quadrature Output Table

This table is intended to show available outputs as currently defined.



### RECOMMENDED INCREMENTAL CONTROL DIAGRAM FOR USE WITH A DEBOUNCE CIRCUIT

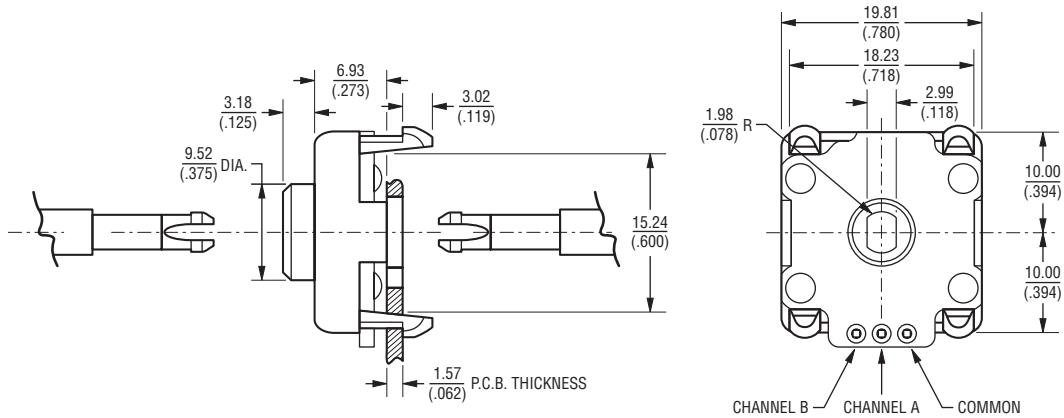


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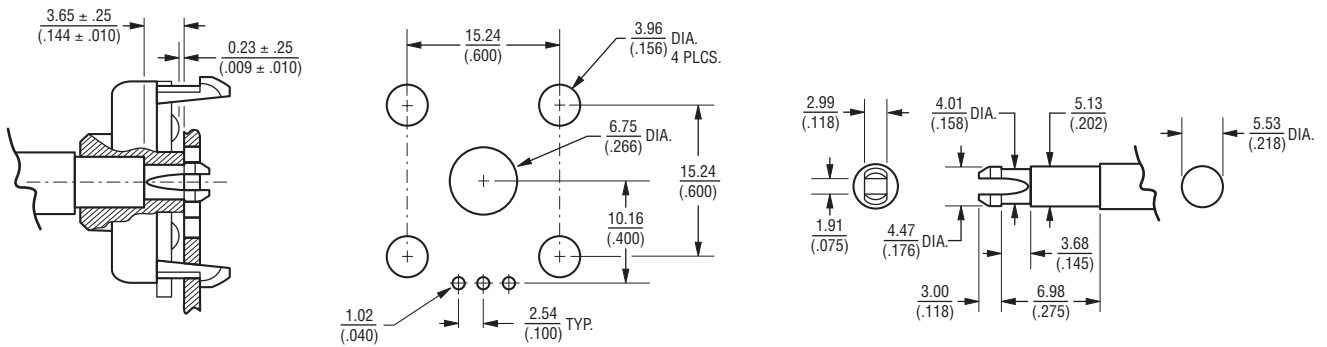
# ES Series - Shaftless Contacting Encoders

**BOURNS®**

## Product Dimensions



## Mounting Dimensions



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

Specifications are subject to change without notice.

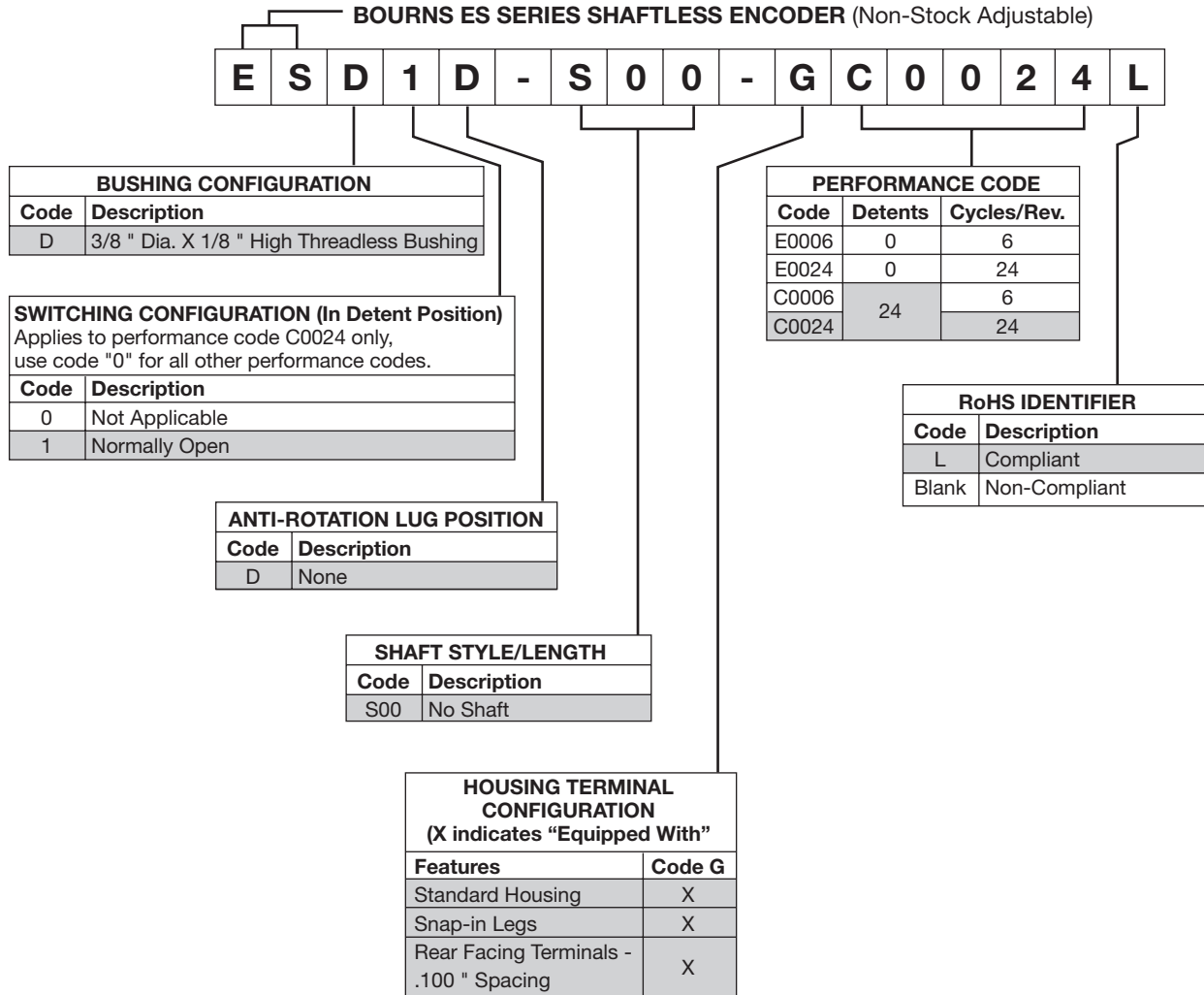
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# ES Series - Shaftless Contacting Encoders

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## How To Order



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