
BOURNS®

## Features

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

# 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 ºC to +85 ºC (-40 °F to +185 °F)
Storage Temperature Range ..... -40 ºC to +85 ºC (-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

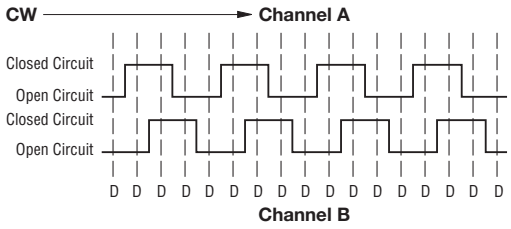
### Mechanical Characteristics

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
    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 name and trademark, part number and date code
Hardware ..... No hardware supplied

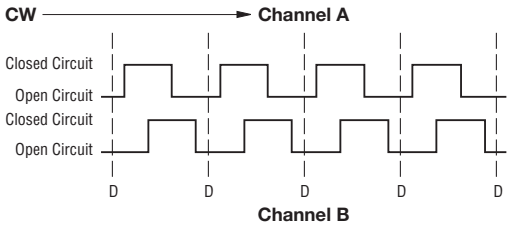
### Quadrature Output Table

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

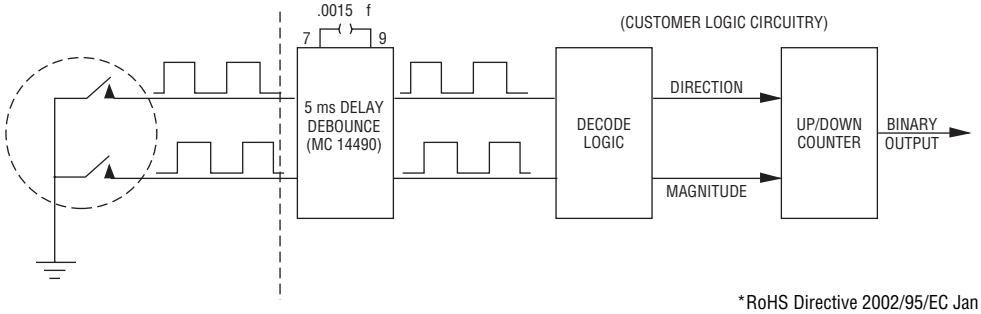
**1/4 CYCLE PER DETENT**




**FULL CYCLE PER DETENT** (Normally Open in Detent Shown)

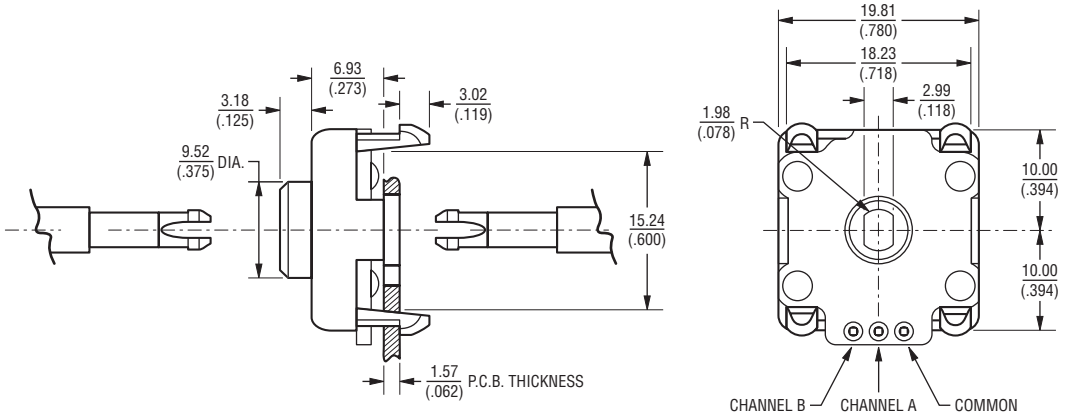



RECOMMENDED INCREMENTAL CONTROL DIAGRAM FOR USE WITH A DEBOUNCE CIRCUIT

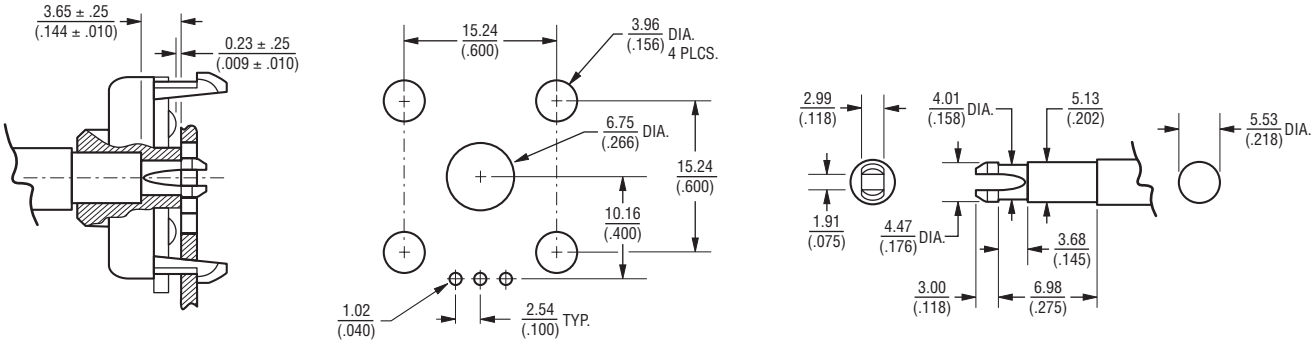



*RoHS Directive 2002/95/EC Jan 27, 2003 including Annex.
Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications

## Product Dimensions




## Mounting Dimensions




DIMENSIONS: MM (INCHES)

## How To Order

**BOURNS ES SERIES SHAFTLESS ENCODER** (Non-Stock Adjustable)

| E | S | D | 1 | D | - | S | 0 | 0 | - | G | C | 0 | 0 | 2 | 4 | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**BUSHING CONFIGURATION**

| Code | Description |
|---|---|
| D | 3/8 " Dia. X 1/8 " High Threadless Bushing |

**SWITCHING CONFIGURATION (In Detent Position)**
Applies to performance codes B0012 and C0024 only, use code "0" for all other performance codes.

| Code | Description |
|---|---|
| 0 | Not Applicable |
| 1 | Normally Open |

**ANTI-ROTATION LUG POSITION**

| Code | Description |
|---|---|
| D | None |

**SHAFT STYLE/LENGTH**

| Code | Description |
|---|---|
| S00 | No Shaft |

**HOUSING TERMINAL CONFIGURATION (X indicates "Equipped With")**

| Features | Code G |
|---|---|
| Standard Housing | X |
| Snap-in Legs | X |
| Rear Facing Terminals - .100 " Spacing | X |

**PERFORMANCE CODE**

| Code | Detents | Cycles/Rev. |
|---|---|---|
| E0006 | 0 | 6 |
| E0009* | 0 | 9 |
| E0012* | 0 | 12 |
| E0024 | 0 | 24 |
| B0012* | 12 | 12 |
| C0006 | 24 | 6 |
| C0024 | | 24 |

**Consult factory.*

**RoHS IDENTIFIER**

| Code | Description |
|---|---|
| L | Compliant |
| Blank | Non-Compliant |

REV. 02/11