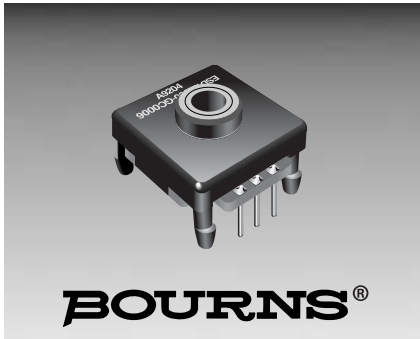




Features

- Quadrature output
- 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 gray code, Channel A leads Channel B by 90 ° electrically 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
Phase Tolerance (CH A to CH B)	90 ° ± 72 °

Environmental Characteristics

Operating Temperature Range	+1 °C to +85 °C (+33 °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

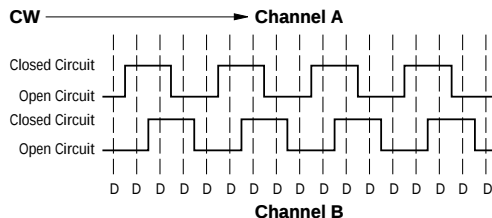
Mechanical Characteristics

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	Recommended hand soldering using Sn95/Ag5 no clean solder, 0.025 " wire diameter. Maximum temperature 399 °C (750 °F) for 3 seconds. No wash process to be used with no clean flux. Part can be wave soldered at 260 °C (500 °F) for 5 seconds, no wash process with no clean flux.
Marking	Manufacturer's name and trademark, part number and date code
Hardware	No hardware supplied

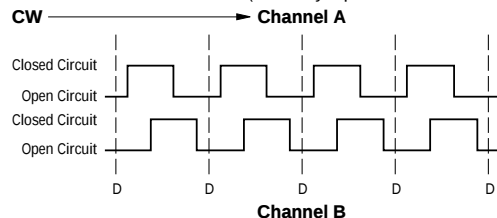
Quadrature Output Table

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

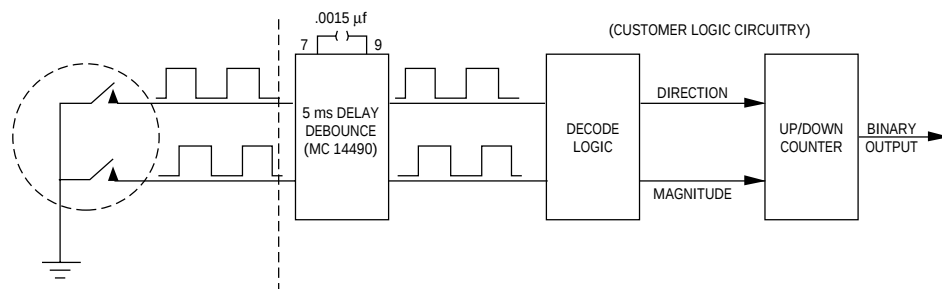
1/4 CYCLE PER DETENT



FULL CYCLE PER DETENT (Normally Open in Detent Shown)



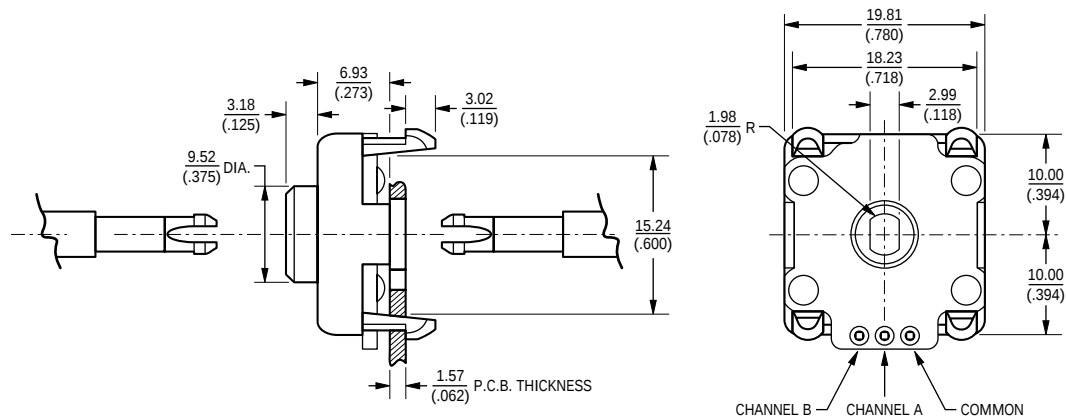
RECOMMENDED INCREMENTAL CONTROL DIAGRAM FOR USE WITH A DEBOUNCE CIRCUIT



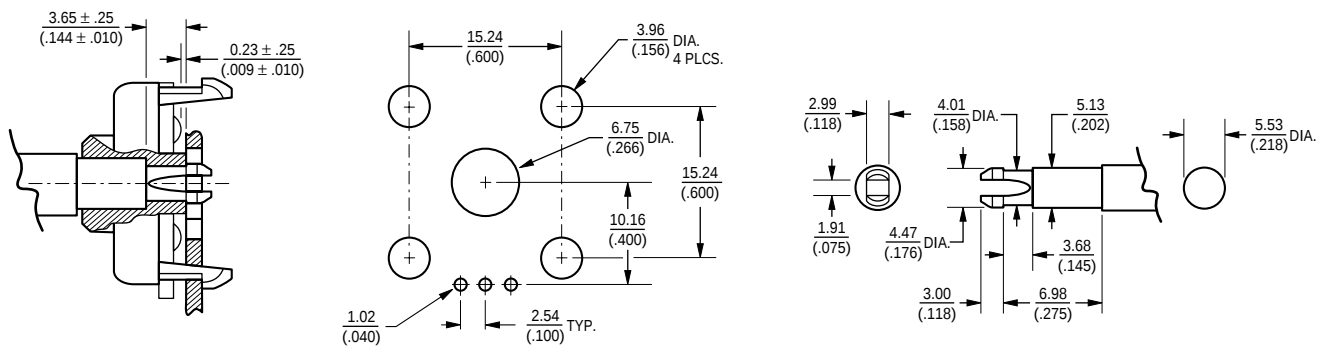
ES Series - Shaftless Contacting Encoders

BOURNS®

Product Dimensions



Mounting Dimensions



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

ES Series - Shaftless Contacting Encoders

How To Order

