

## Features

- RoHS compliant\*
- HCMOS, CMOS and TTL compatible
- Compact package size
- High rotational cycle life
- Ball bearing shaft support
- Recommended for machine/machine interface applications (MMI)



## ES14 - 14 mm Rotary Optical Encoder

### Electrical Characteristics

Electrical Output .....	2-bit quadrature code
Resolution .....	8 to 64 pulses per revolution (PPR)
Supply Voltage (VCC) .....	5.0 VDC $\pm$ 0.25 VDC
Supply Current (ICC) .....	26 mA maximum
Output Voltage	
Low (VCE(sat)), per Channel .....	800 mV maximum at I(SINK) = 25 mA
High (VO(HI)), per Channel .....	4.0 VDC minimum @ VCC = 4.75 VDC
Output Current I(SINK), per Channel .....	25 mA minimum
Rise/Fall Time .....	200 ns typical
Power Dissipation .....	167 mW maximum
Pulse Width (per Channel) .....	180 $\mu$ s typical
Phase Angle (Channel A Leads Channel B, Clockwise Rotation) .....	90 $\mu$ s $\pm$ 72 $\mu$ s
Insulation Resistance @ 500 VDC .....	1,000 megohms minimum
Operating RPM .....	1000 maximum

### Environmental Characteristics

Operating Temperature Range @ 5.0 VDC .....	-40 $^{\circ}$ C to +70 $^{\circ}$ C (-40 $^{\circ}$ F to +158 $^{\circ}$ F)
Storage Temperature Range .....	-55 $^{\circ}$ C to +125 $^{\circ}$ C (-67 $^{\circ}$ F to +257 $^{\circ}$ F)
Vibration .....	15 G
Shock .....	50 G
Humidity .....	MIL-STD-202, Method 103, Condition B
Flammability .....	Conforms to UL 94HB
IP Rating .....	IP 54**

### Mechanical Characteristics

Mechanical Angle .....	360 $^{\circ}$ Continuous
Torque	
Starting/Running .....	1.05 N-mm (0.15 oz.-in.) maximum
Rotational Life .....	50,000,000 cycles (100,000,000 revolutions)
Shaft Radial Play .....	0.003 in. maximum
Shaft Axial Structural Strength .....	35 lbs. minimum
Mounting Torque .....	2.0 N-m (18 lb.-in.) maximum

### Materials and Finishes

Terminals .....	Sn plated PC pins
Soldering Condition	
Manual Soldering .....	96.5Sn/3.0Ag/0.5Cu solid wire or no-clean rosin cored wire 370 $^{\circ}$ C (700 $^{\circ}$ F) max. for 3 seconds
Wave Soldering .....	96.5Sn/3.0Ag/0.5Cu solder with no-clean flux 260 $^{\circ}$ C (500 $^{\circ}$ F) max. for 5 seconds
Wash processes .....	Not recommended
Mounting Hardware	
Nut .....	Brass, hex (metric)/Nickel-plated brass, hex (SAE)
Lockwasher .....	Nickel-plated spring steel, internal tooth
Marking .....	Manufacturer's symbol, model number, product code, terminal style and date code
Standard Packaging .....	Anti-static plastic tube (25 pcs./tube)

\*\*When device is mounted by normal mounting means.

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.

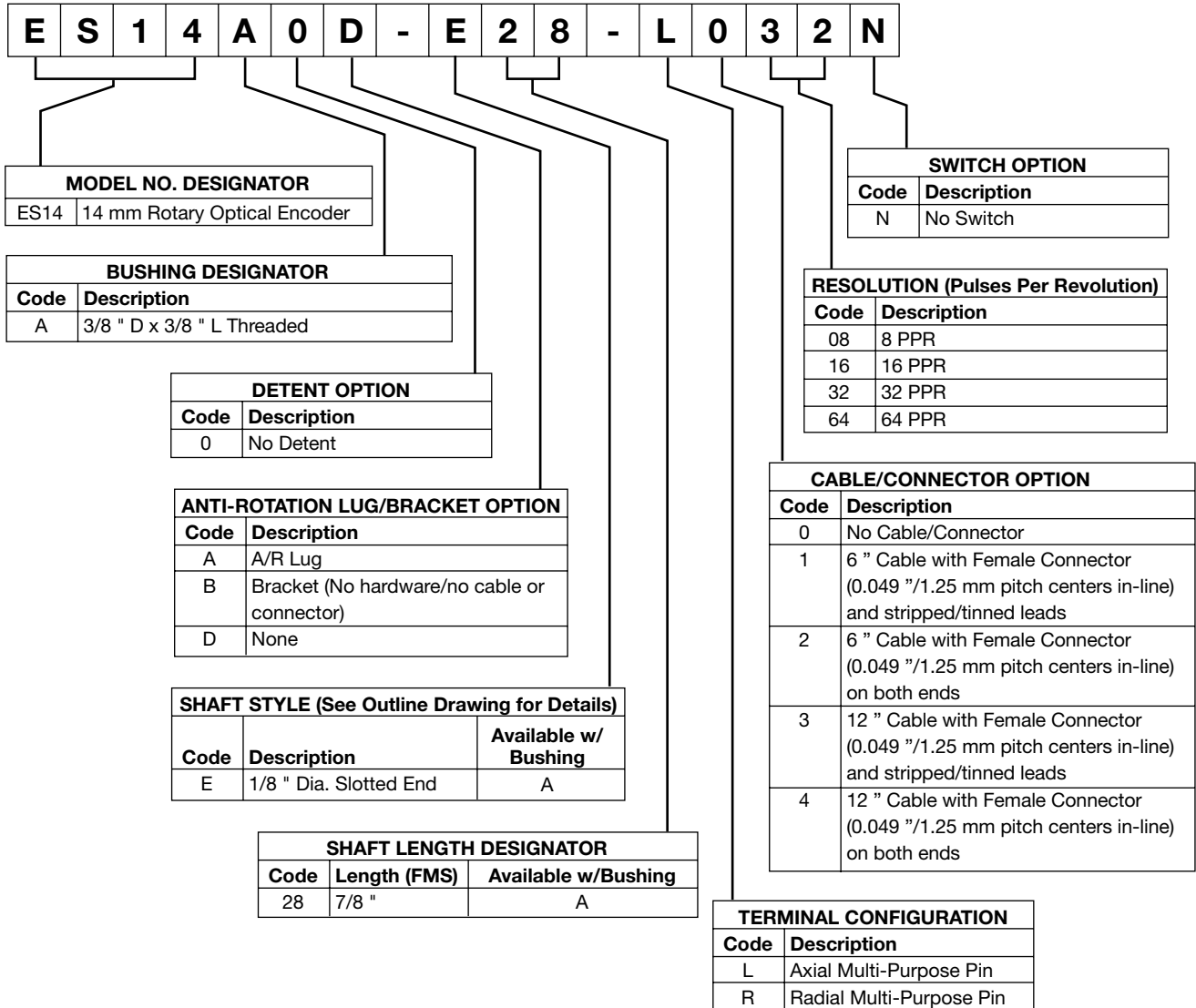
## Additional Features

- Cable/connector option
- Optional bracket

# ES14 - 14 mm Rotary Optical Encoder

**BOURNS®**

### Part Numbering System



#### Cable and Connector Options:

- H-290-4 = 6 " Cable with Female Connector (0.049 "/1.25 mm pitch centers in-line) and stripped/tinned leads
- H-290-1 = 6 " Cable with Female Connector (0.049 "/1.25 mm pitch centers in-line) on both ends
- H-290-2 = 12 " Cable with Female Connector (0.049 "/1.25 mm pitch centers in-line) and stripped/tinned leads
- H-290-3 = 12 " Cable with Female Connector (0.049 "/1.25 mm pitch centers in-line) on both ends

For other cable and connector options, please contact the factory.

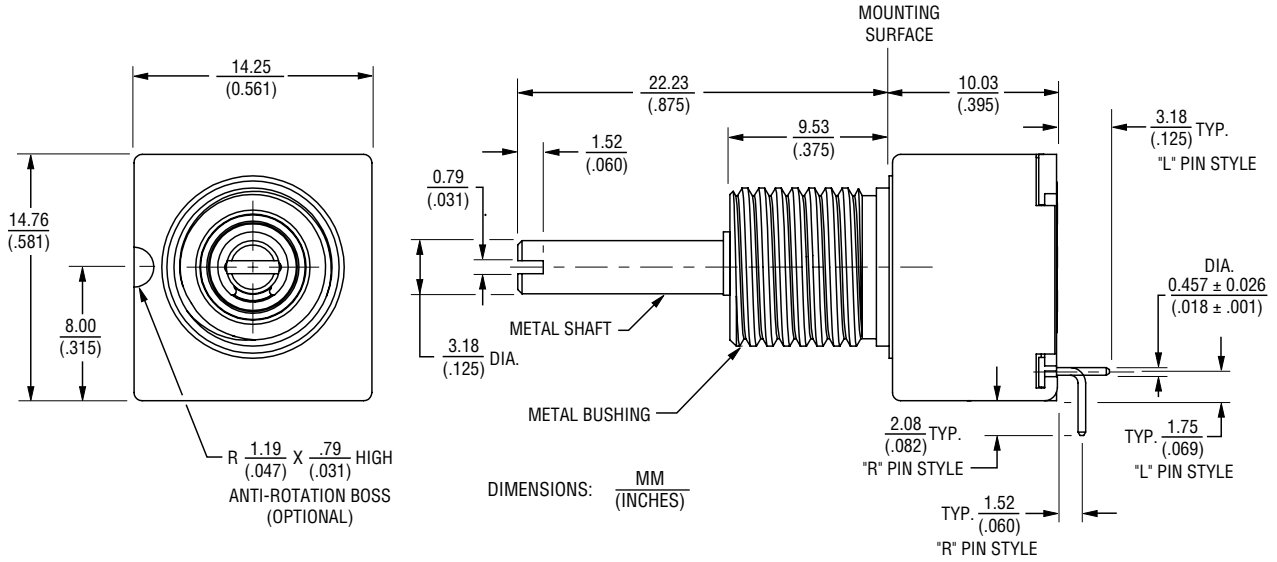
Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

# ES14 - 14 mm Rotary Optical Encoder

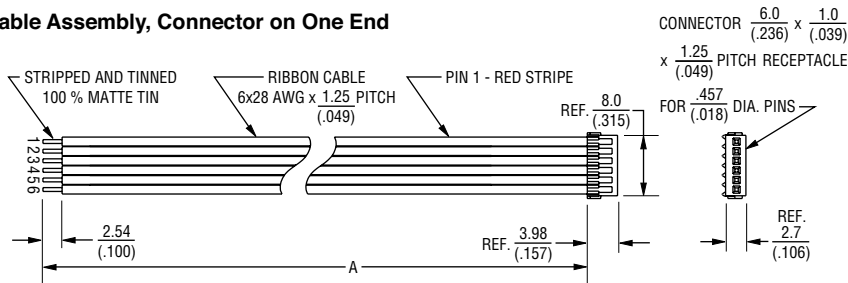
**BOURNS®**

## Product Dimensions

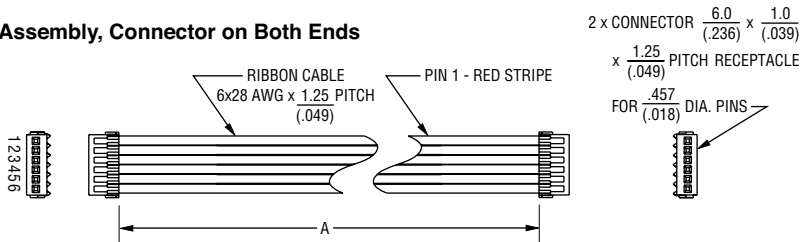


## Cable/Connector Options

### Cable Assembly, Connector on One End



### Cable Assembly, Connector on Both Ends



HARDWARE NUMBER	DESCRIPTION	"A" DIM.
H-290-4	CABLE ASSEMBLY, CONNECTOR ON ONE END	152.4 ± 5.0 (6.0 ± .197)
H-290-2	CABLE ASSEMBLY, CONNECTOR ON ONE END	304.8 ± 5.0 (12.0 ± .197)
H-290-1	CABLE ASSEMBLY, CONNECTOR ON BOTH ENDS	152.4 ± 5.0 (6.0 ± .197)
H-290-3	CABLE ASSEMBLY, CONNECTOR ON BOTH ENDS	304.8 ± 5.0 (12.0 ± .197)

DIMENSIONS: MM (INCHES)

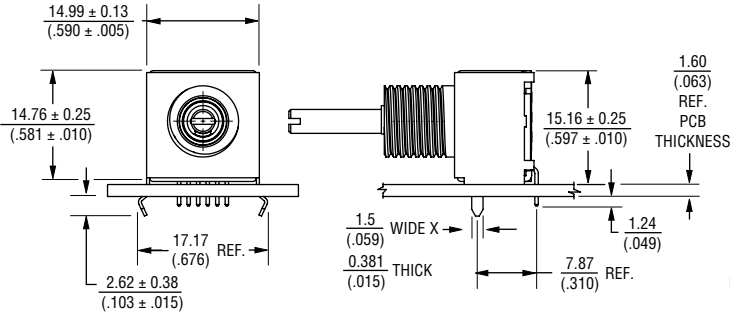
Specifications are subject to change without notice. The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

# ES14 - 14 mm Rotary Optical Encoder

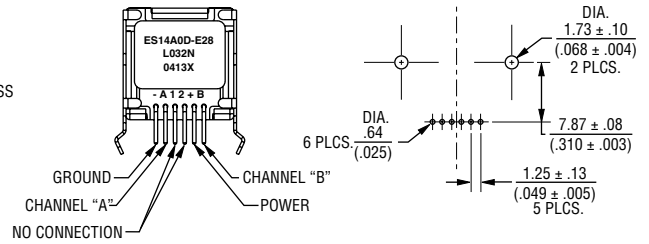
**BOURNS®**

## Terminal Configurations

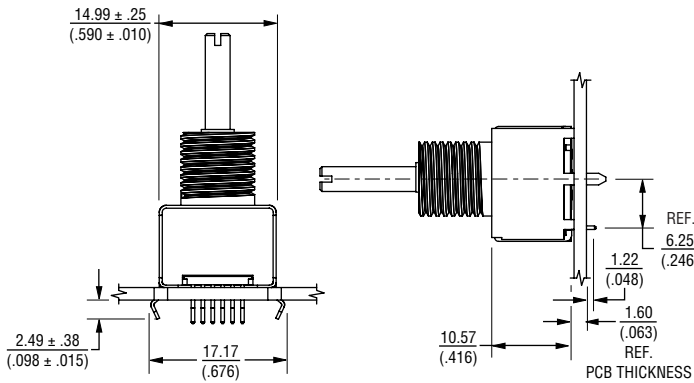
### Radial (shown with optional mounting bracket)



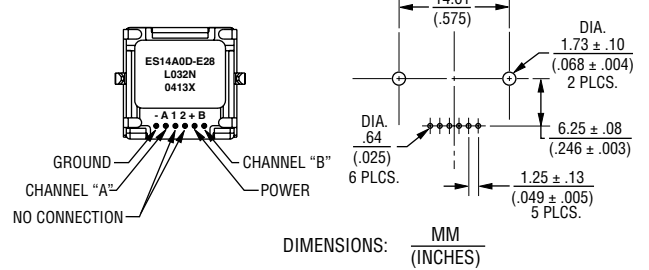
### Recommended PCB Layout



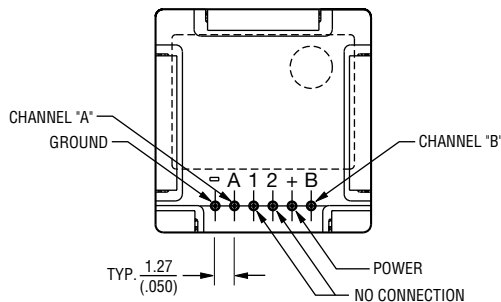
### Axial (shown with optional mounting bracket)



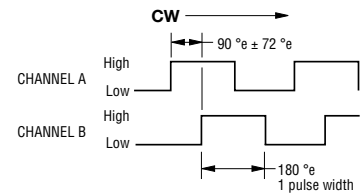
### Recommended PCB Layout



## Terminal Diagram



## Quadrature Output

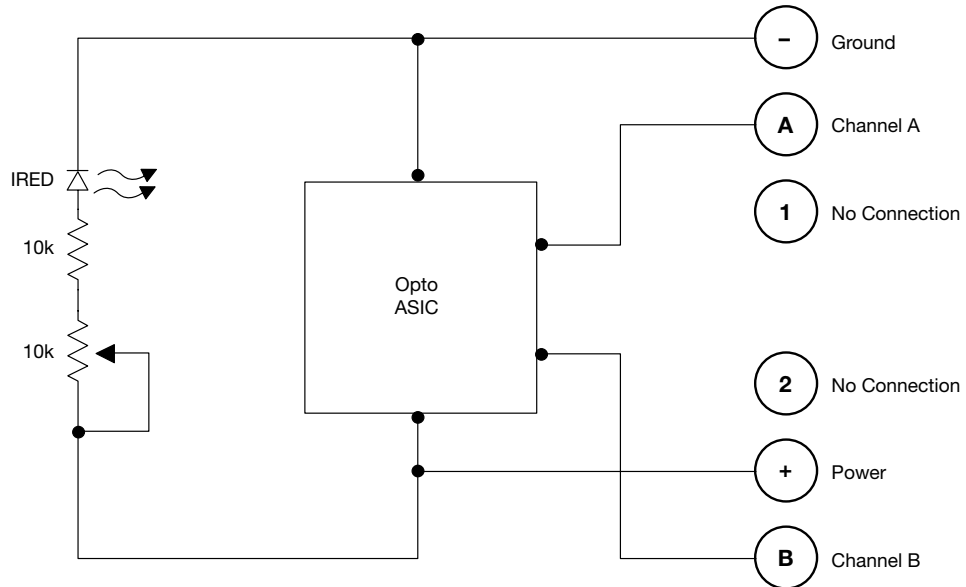


Specifications are subject to change without notice. The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

# ES14 - 14 mm Rotary Optical Encoder

**BOURNS®**

## Electrical Block Diagram



**BOURNS®**

**Asia-Pacific:** Tel: +886-2 2562-4117 • Fax: +886-2 2562-4116

**EMEA:** Tel: +36 88 520 390 • Fax: +36 88 520 211

**The Americas:** Tel: +1-951 781-5500 • Fax: +1-951 781-5700

[www.bourns.com](http://www.bourns.com)

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)

Email: [org@lifeelectronics.ru](mailto:org@lifeelectronics.ru)