



## Features

- Compact design, long life and high reliability
- Low cost compared to optical type encoders
- Available in a wide variety of configurations to meet many user requirements



## PEC16 - 16 mm Incremental Encoder

### Electrical Characteristics

|                                 |                       |
|---------------------------------|-----------------------|
| Output.....                     | 2-bit quadrature code |
| Closed Circuit Resistance ..... | 3 ohms maximum        |
| Contact Rating .....            | 1 mA @ 5 VDC          |
| Insulation Resistance .....     | 10 megohms @ 50 VDC   |
| Dielectric Withstanding Voltage |                       |
| Sea Level.....                  | 50 VAC minimum        |
| Electrical Travel .....         | Continuous            |
| Contact Bounce (15 RPM).....    | 5.0 ms. maximum**     |
| RPM (Operating) .....           | 100 maximum**         |

### Environmental Characteristics

|                                   |   |
|-----------------------------------|---|
| Operating Temperature Range ..... | -30 °C to +70 °C (-22 °F to +158 °F)    |
| Storage Temperature Range .....   | -40 °C to +85 °C (-40 °F to +185 °F)    |
| Humidity.....                     | MIL-STD-202, Method 103B, Condition B   |
| Vibration .....                   | 10~55~10 Hz / 1 min. / Amplitude 1.5 mm |
| Shock.....                        | 100 G                                   |
| Rotational Life.....              | 100,000 cycles minimum                  |
| Switch Life .....                 | 20,000 cycles minimum                   |
| IP Rating.....                    | IP 40                                   |
| Moisture Sensitivity Level.....   | 1                                       |
| ESD Classification (HBM).....     | N/A                                     |

### Mechanical Characteristics

|                               |   |
|-------------------------------|---|
| Mechanical Angle .....        | 360 ° continuous  |
| Torque                        |   |
| Detent .....                  | 30 to 90 gf-cm (0.41 to 1.24 oz.-in)                                      |
| Running .....                 | 10 to 70 gf-cm (0.13 to 0.97 oz.-in)                                      |
| Mounting.....                 | 10.2 kgf. cm (8.83 lb.-in.) maximum                                       |
| Shaft Side Load (Static)..... | 3.06 kgf (6.7 lbs.) minimum   |
| Weight .....                  | 8 gm (0.28 oz.) maximum   |
| Terminals .....               | Printed circuit board terminals   |
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| Soldering Condition           |   |
| Wave Soldering.....           | Sn95.5/Ag2.8/Cu0.7 solder with no-clean flux: 260 °C max. for 3-5 seconds |
| Hand Soldering .....          | Not recommended   |
| Hardware .....                | One flat washer and one mounting nut supplied with each encoder           |

### Switch Characteristics

|                                    |  |
|------------------------------------|--|
| Switch Type .....                  | Contact Push ON Momentary SPST         |
| Power Rating (Resistive Load)..... | 10 mA at 5 V DC                        |
| Switch Travel .....                | 0.5 +0.4/-0.3 mm                       |
| Switch Actuation Force.....        | 360 +153/-102 gf (5 +2.1/-1.4 oz.-in.) |

### How To Order

**PEC16 - 4 0 20 F - S 0012**

|                              |  |
|------------------------------|--|
| Model .....                  | PEC16 - 4 0 20 F - S 0012  |
| Terminal Configuration ..... | 2 = PC Pin Vertical/Down Facing    4 = PC Horizontal/Rear Facing                     |
| Detent Option .....          | 0 = No Detents    1 = 12 Detents    2 = 24 Detents                                   |
| Standard Shaft Length .....  | 15 = 15 mm    25 = 25.0 mm <sup>1</sup><br>20 = 20.0 mm    30 = 30.0 mm <sup>1</sup> |
| Shaft Style .....            | F = Insulated Flatted Shaft  |
| Switch Configuration .....   | S = Push Momentary Switch    N = No Switch   |
| Resolution .....             | 0012 = 12 Pulses per 360 ° Rotation    0024 = 24 Pulses per 360 ° Rotation           |

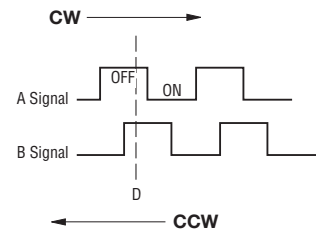
<sup>1</sup> Not available with switch.

### Additional Information

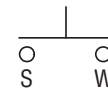
Click these links for more information:



### Quadrature Output Table



### Switch Circuit



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**WARNING**  
**Cancer and Reproductive Harm**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.  
\*\*Devices are tested using standard noise reduction filters. For optimum performance, designers should use noise reduction filters in their circuits. Specifications are subject to change without notice. Users should verify actual device performance in their specific applications. The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).



#### CAUTION

Do not store product in high temperature and humidity, direct sunlight and/or places where corrosive gases may be generated. Please use product within 6 months from the date of delivery and promptly after unpacking.

## Applications

Level control, tuning and timer settings in:

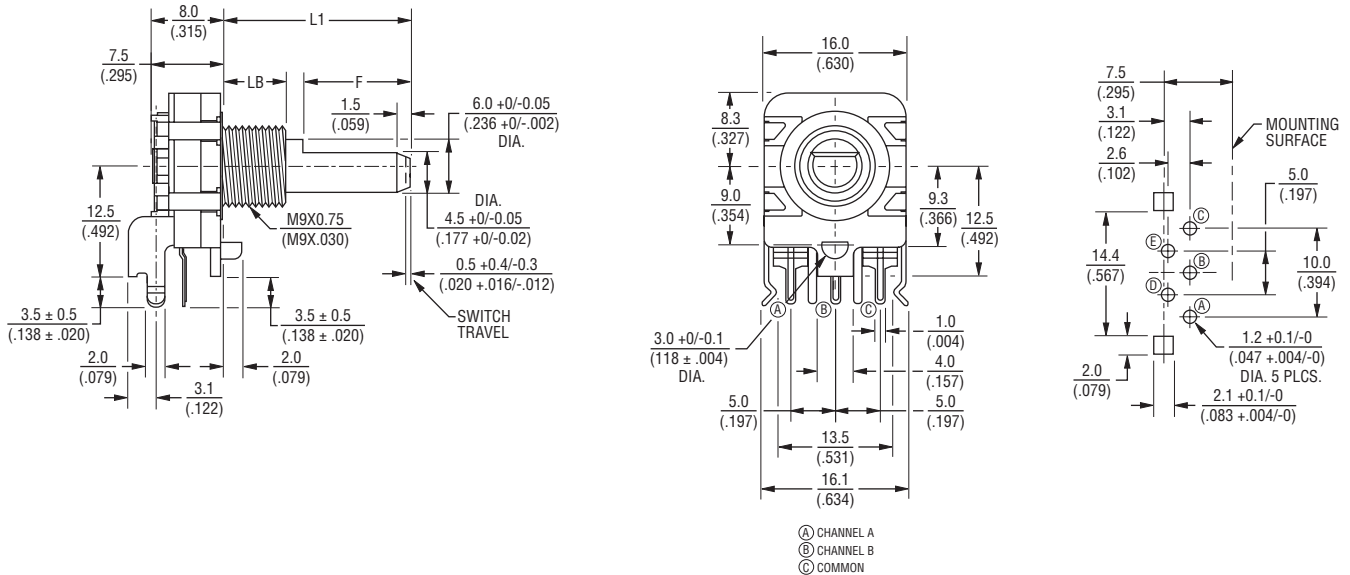
- Audio-visual equipment
- Consumer electric appliances
- Radios
- Musical instrumentation
- Communications equipment

# PEC16 - 16 mm Incremental Encoder

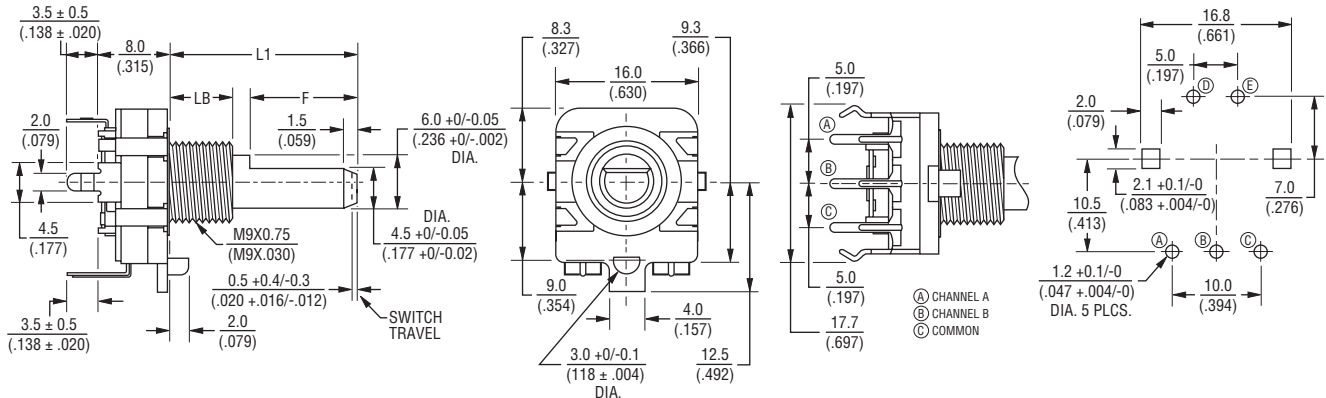
# BOURNS®

## Product Dimensions

### PEC16-2xxxF-Sxxxx



### PEC16-4xxxF-Sxxxx



|    | 15.0<br>(.591) | 20.0<br>(.787) | 25.0<br>(.984) | 30.0<br>(1.181) |
|----|----------------|----------------|----------------|-----------------|
| L1 | 15.0<br>(.591) | 20.0<br>(.787) | 25.0<br>(.984) | 30.0<br>(1.181) |
| LB | 5.0<br>(.197)  | 7.0<br>(.276)  | 7.0<br>(.276)  | 7.0<br>(.276)   |
| F  | 7.0<br>(.276)  | 12.0<br>(.472) | 12.0<br>(.472) | 12.0<br>(.472)  |

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

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

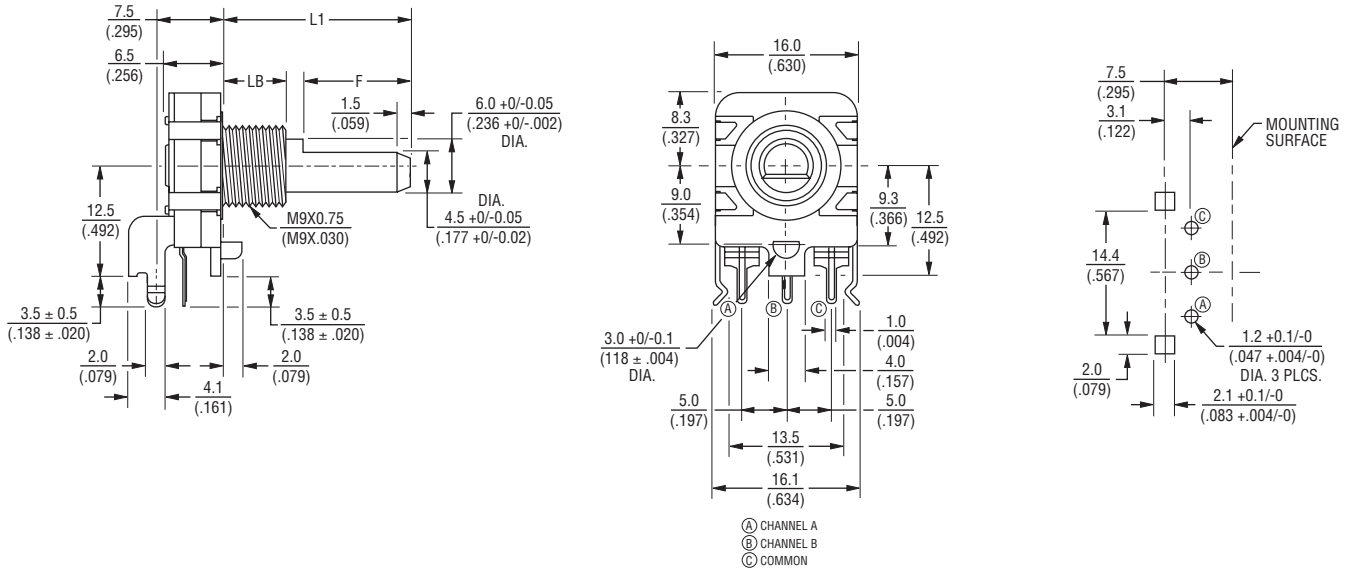
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# PEC16 - 16 mm Incremental Encoder

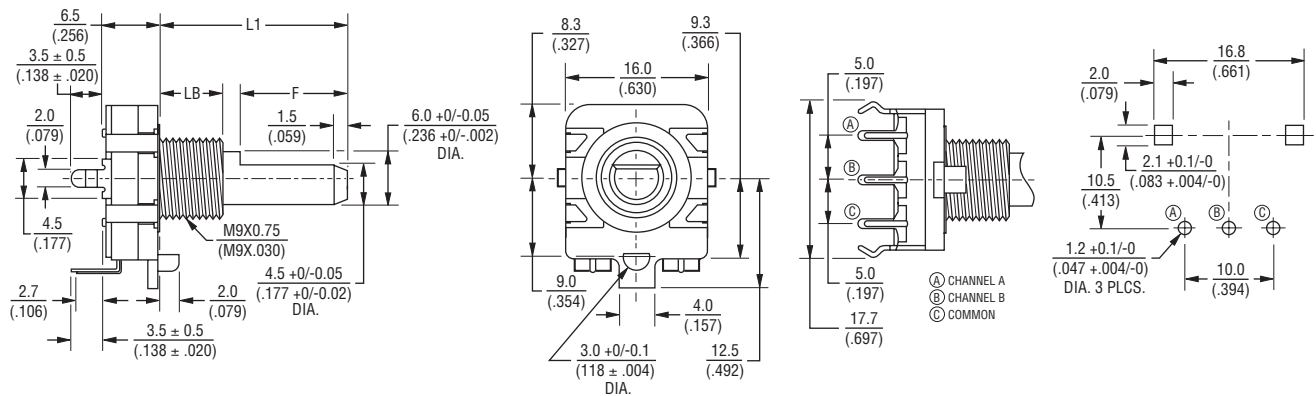
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## Product Dimensions

### PEC16-2xxxF-Nxxxx



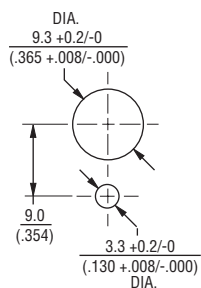
### PEC16-4xxxF-Nxxxx



|    |                |                |                |                 |
|----|----------------|----------------|----------------|-----------------|
| L1 | 15.0<br>(.591) | 20.0<br>(.787) | 25.0<br>(.984) | 30.0<br>(1.181) |
| LB | 5.0<br>(.197)  | 7.0<br>(.276)  | 7.0<br>(.276)  | 7.0<br>(.276)   |
| F  | 7.0<br>(.276)  | 12.0<br>(.472) | 12.0<br>(.472) | 12.0<br>(.472)  |

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

### Panel Hole Detail



REV. 01/22

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