

## Features

- Compact design, long life and high reliability
- Momentary push switch option
- Available in a wide variety of configurations to meet many user requirements



## PEC12R - 12 mm Incremental Encoder

### Electrical Characteristics

|                                 |                       |
|---------------------------------|-----------------------|
| Output .....                    | 2-bit quadrature code |
| Contact Rating .....            | 10 mA @ 5 VDC         |
| Insulation Resistance .....     | 10 megohms @ 250 VDC  |
| Dielectric Withstanding Voltage |                       |
| Sea Level .....                 | 50 VAC minimum        |
| Electrical Travel .....         | Continuous            |
| Contact Bounce (15 RPM) .....   | 2.0 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 .....             | 30,000 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 1.25 oz-in)                                          |
| Running .....                  | 10 to 70 gf-cm (0.14 to 0.97 oz-in)                                          |
| Mounting .....                 | 10.2 kgf.cm (8.83 lb.-in.) maximum                                           |
| Shaft Side Load (Static) ..... | 2.04 kgf (4.5 lbs.) minimum                                                  |
| Weight .....                   | 3 gm (0.1 oz.) maximum                                                       |
| Terminals .....                | Printed circuit board terminals                                              |
| Terminals .....                | Printed circuit board terminals                                              |
| Soldering Condition            |                                                                              |
| Wave Soldering .....           | Sn95.5/Ag2.8/Cu0.7 solder with no-clean flux:<br>260 °C max. for 3 ± 1 sec.  |
| Hand Soldering .....           | Not recommended                                                              |
| Hardware .....                 | One flat washer and one mounting nut supplied with each encoder with bushing |

### Switch Characteristics

|                                     |                                    |
|-------------------------------------|------------------------------------|
| Switch Type .....                   | Contact Push ON Momentary SPST     |
| Power Rating (Resistive Load) ..... | 10 mA at 5 V DC                    |
| Switch Travel .....                 | 0.5 ± 0.3 mm                       |
| Switch Actuation Force .....        | 610 ± 306 gf (8.47 ± 4.24 oz.-in.) |
| Contact Resistance .....            | 100 milliohms @ 5 VDC              |

### How To Order

**PEC12R - 4 0 20 F - S 0012**

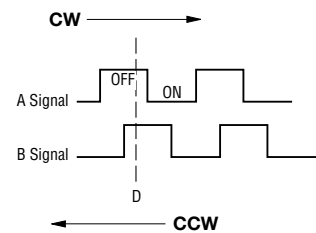
|                                                                                  |              |
|----------------------------------------------------------------------------------|--------------|
| Model _____                                                                      | _____        |
| Terminal/Bushing Configuration _____                                             | _____        |
| 2 = Vertical Mount - Radial PC Pin/No Bushing                                    |              |
| 3 = Horizontal Mount - Axial PC Pin/with Bushing                                 |              |
| 4 = Horizontal Mount - Axial PC Pin/No Bushing                                   |              |
| Detent Option _____                                                              | _____        |
| 0 = No Detents   1 = 12 Detents (available with 12 pulses only)   2 = 24 Detents |              |
| Standard Shaft Length _____                                                      | _____        |
| 15 = 15.0 mm (Horizontal Mount/No Bushing only)                                  | 22 = 22.5 mm |
| 17 = 17.5 mm                                                                     | 25 = 25.0 mm |
| 20 = 20.0 mm                                                                     | 30 = 30.0 mm |
| 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        |              |

### Additional Information

Click these links for more information:



### Quadrature Output Table



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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

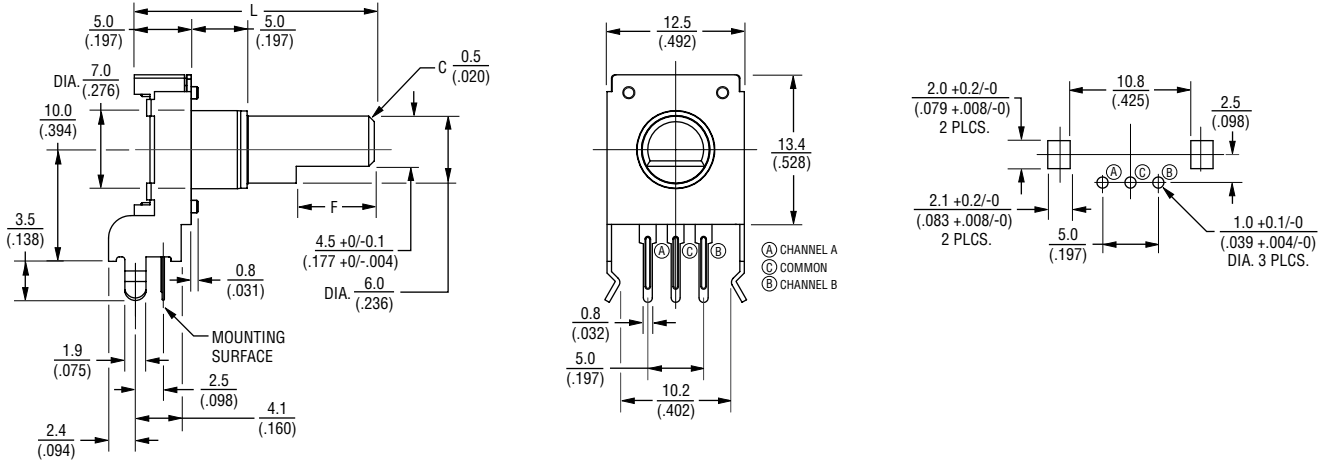
Level control, tuning and timer settings in:

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

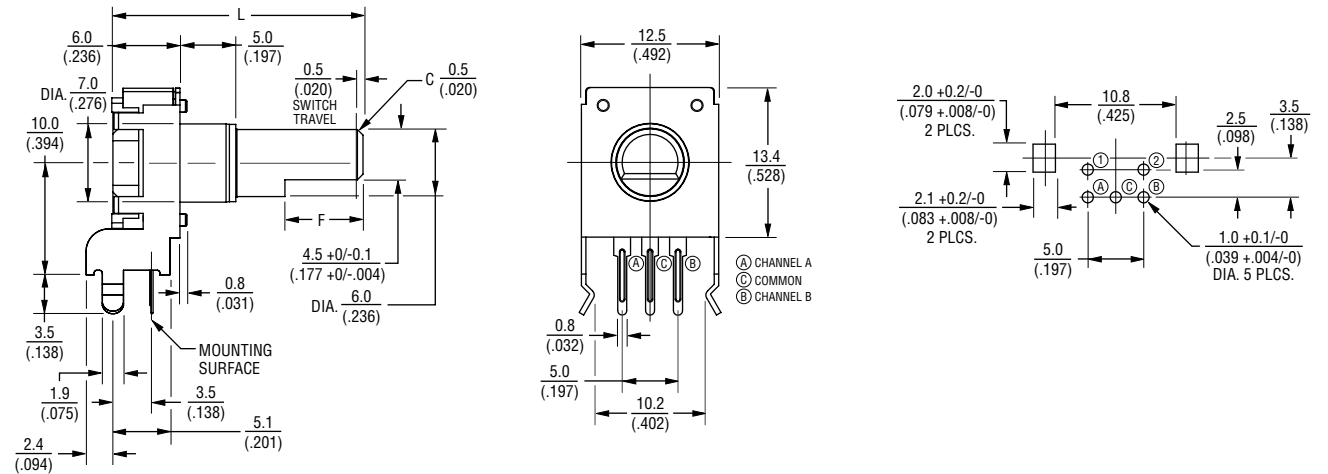
## PEC12R - 12 mm Incremental Encoder **BOURNS®**

### Product Dimensions

#### PEC12R-2xxxF-Nxxxx (Vertical Mount - Radial PC Pin/No Bushing, No Switch)



#### PEC12R-2xxxF-Sxxxx (Vertical Mount - Radial PC Pin/No Bushing, Push Momentary Switch)



|   |                |                |                |                |                 |
|---|----------------|----------------|----------------|----------------|-----------------|
| L | 17.5<br>(.688) | 20.0<br>(.787) | 22.5<br>(.886) | 25.0<br>(.984) | 30.0<br>(1.181) |
| F | 5.0<br>(.197)  | 7.0<br>(.276)  | 7.0<br>(.276)  | 12.0<br>(.472) | 12.0<br>(.472)  |

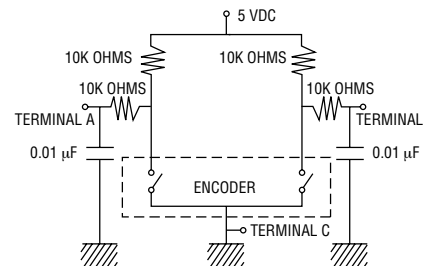
DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

TOLERANCE:  $\frac{<10}{(<.400)} = \frac{\pm 0.3}{(\pm .012)}$   
 $\frac{\geq 10}{(\geq .400)} = \frac{\pm 0.5}{(\pm .020)}$

#### Switch Circuit



#### Suggested Filter Circuit



Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

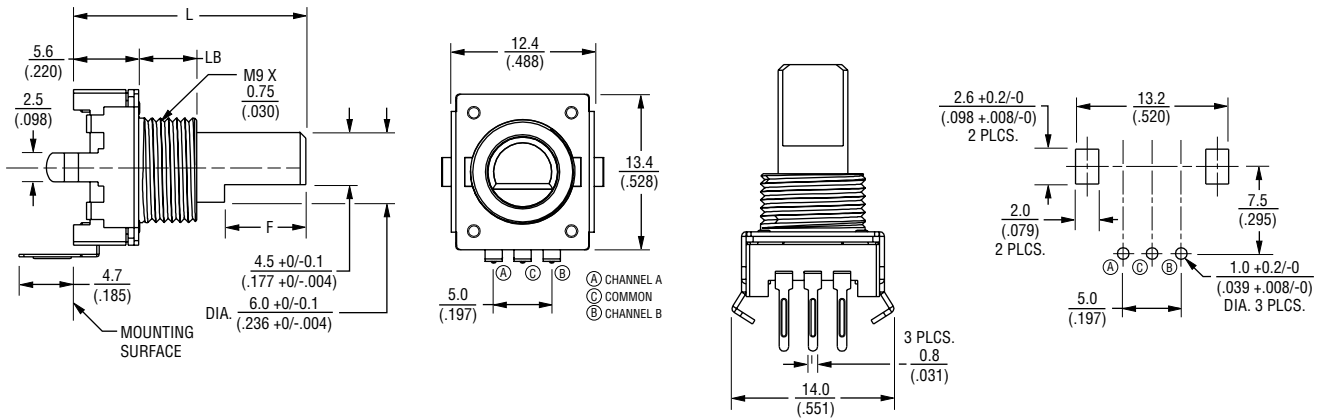
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# PEC12R - 12 mm Incremental Encoder

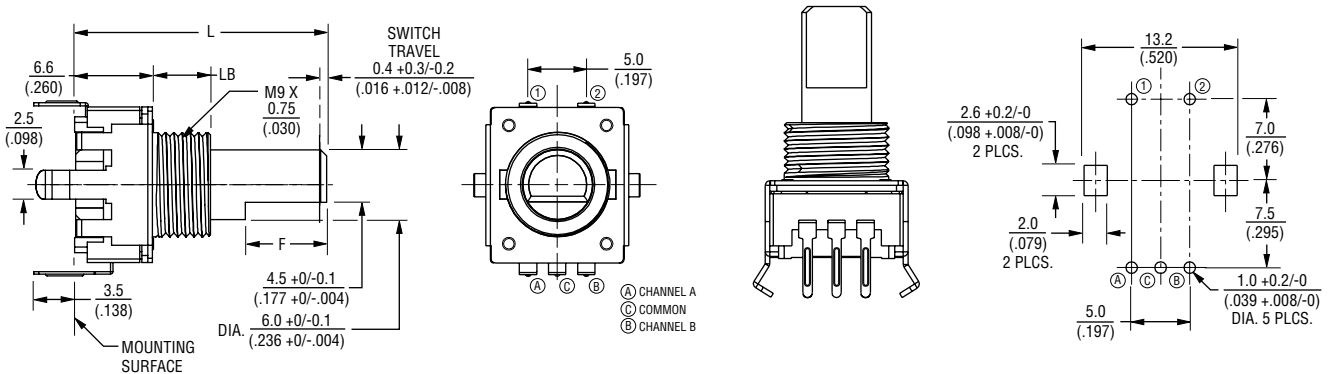
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## Product Dimensions

### PEC12R-3xxxF-Nxxxx (Horizontal Mount - Axial PC Pin/with Bushing, No Switch)



### PEC12R-3xxxF-Sxxxx (Horizontal Mount - AxialPC Pin/with Bushing, Push Momentary Switch)



|    |                |                |                |                |                 |
|----|----------------|----------------|----------------|----------------|-----------------|
| L  | 17.5<br>(.688) | 20.0<br>(.787) | 22.5<br>(.886) | 25.0<br>(.984) | 30.0<br>(1.181) |
| LB | 5.0<br>(.197)  | 5.0<br>(.197)  | 7.0<br>(.276)  | 7.0<br>(.276)  | 7.0<br>(.276)   |
| F  | 5.0<br>(.197)  | 7.0<br>(.276)  | 7.0<br>(.276)  | 12.0<br>(.472) | 12.0<br>(.472)  |

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

TOLERANCE:  $\frac{<10}{(<.400)} = \frac{\pm 0.3}{(\pm .012)}$

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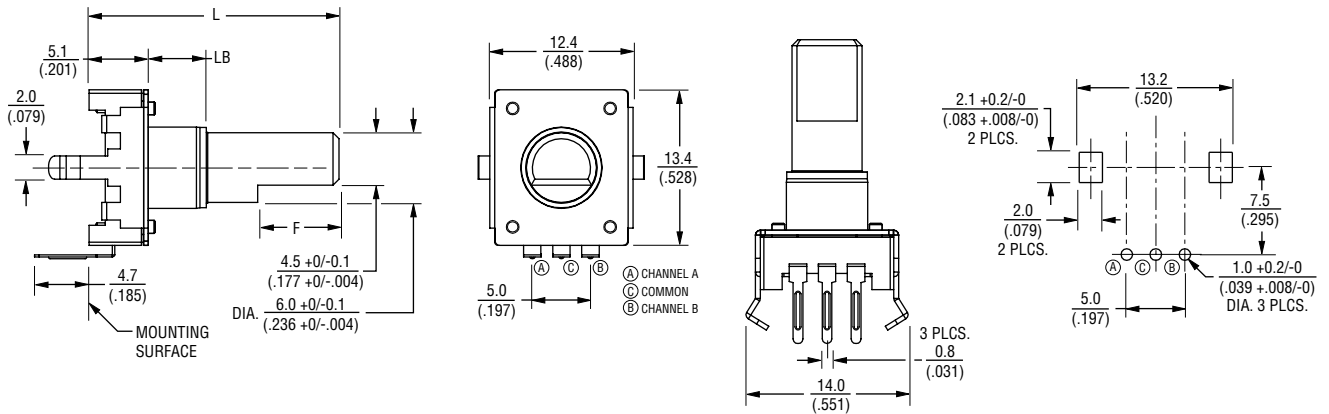
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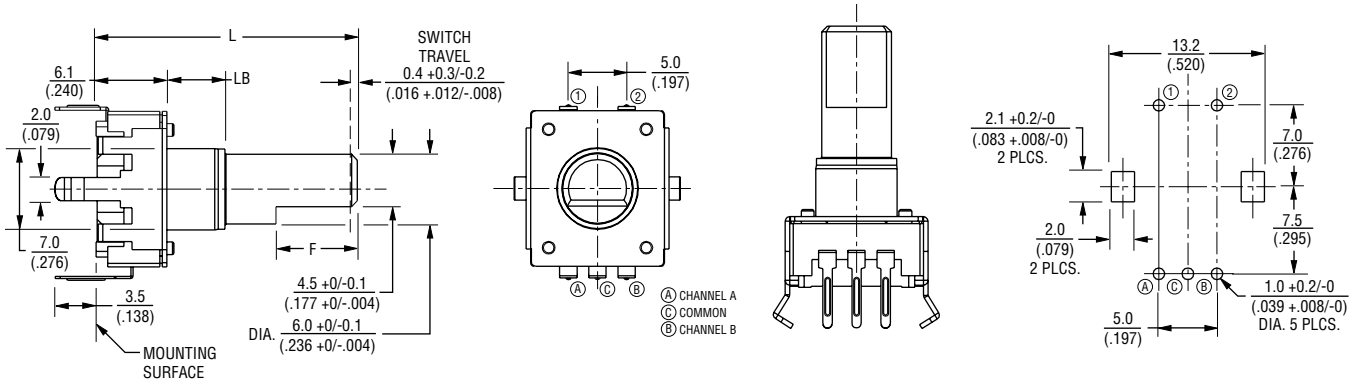
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## Product Dimensions

### PEC12R-4xxxF-Nxxxx (Horizontal Mount - Axial PC Pin/No Bushing, No Switch)



### PEC12R-4xxxF-Sxxxx (Horizontal Mount - Axial PC Pin/No Bushing, Push Momentary Switch)



|    |                |                |                |                |                |                 |
|----|----------------|----------------|----------------|----------------|----------------|-----------------|
| L  | 15.0<br>(.591) | 17.5<br>(.688) | 20.0<br>(.787) | 22.5<br>(.886) | 25.0<br>(.984) | 30.0<br>(1.181) |
| LB | 2.0<br>(.079)  | 5.0<br>(.197)  | 5.0<br>(.197)  | 5.0<br>(.197)  | 5.0<br>(.197)  | 5.0<br>(.197)   |
| F  | 5.0<br>(.197)  | 5.0<br>(.197)  | 7.0<br>(.276)  | 7.0<br>(.276)  | 12.0<br>(.472) | 12.0<br>(.472)  |

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

TOLERANCE:  $\frac{<10}{(<.400)} = \frac{\pm 0.3}{(\pm .012)}$   
 $\frac{\geq 10}{(\geq .400)} = \frac{\pm 0.5}{(\pm .020)}$

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