

## Features

- Push switch option
- Compact, rugged design
- High reliability
- Metal bushing/shaft
- RoHS compliant\*

## PEC11R Series - 12 mm Incremental Encoder

### Electrical Characteristics

Output ..... 2-bit quadrature code  
 Contact Rating ..... 10 mA @ 5 VDC  
 Insulation Resistance  
 ..... 100 megohms @ 250V DC  
 Dielectric Withstanding Voltage  
 Sea Level ..... 300 VAC min.  
 Electrical Travel ..... Continuous  
 Contact Bounce (15 RPM) ..... 2.0 ms max.\*\*  
 RPM (Operating) ..... 60 max.\*\*

### 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  
 IP Rating ..... IP 40

### Mechanical Characteristics

Mechanical Angle ..... 360 ° Continuous  
 Torque  
 Detent .. 30 to 90 gf-cm (0.41 to 1.25 oz.-in.)  
 Running ... 10-70 gf-cm (0.14 to 0.97 oz.-in.)  
 Mounting ..... 10.2 kgf-cm (8.83 lb.-in.) max.  
 Shaft Side Load (Static)  
 ..... 2.04 kgf (4.5 lbs.) min.  
 Weight ..... 5 gm (0.17 oz.) max.  
 Terminals ..... Printed circuit board terminals  
 Soldering Condition  
 Wave Soldering ..... Sn95.5/Ag2.8/Cu0.7  
 solder with no-clean flux: 260 °C max. for  
 3 ± 1 sec.  
 Hand Soldering ..... Not recommended  
 Hardware .. One flat washer and one mounting  
 nut supplied with each encoder  
 Rotational Life ..... 30,000 cycles min.  
 Switch Life ..... 20,000 cycles min.

### Switch Characteristics

Switch Type  
 ..... Contact Push ON Momentary SPST  
 Power Rating (Resistive Load)  
 ..... 10 mA at 5 VDC  
 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

**CALIFORNIA WARNING:** Can expose you to lead, a carcinogen and reproductive toxicant. See [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).

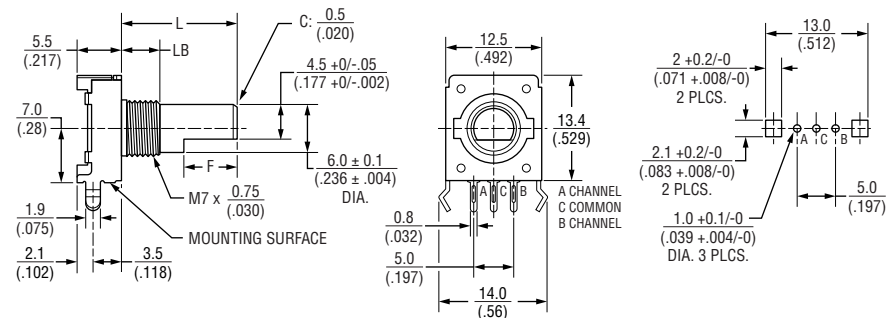
### Additional Information

Click these links for more information:

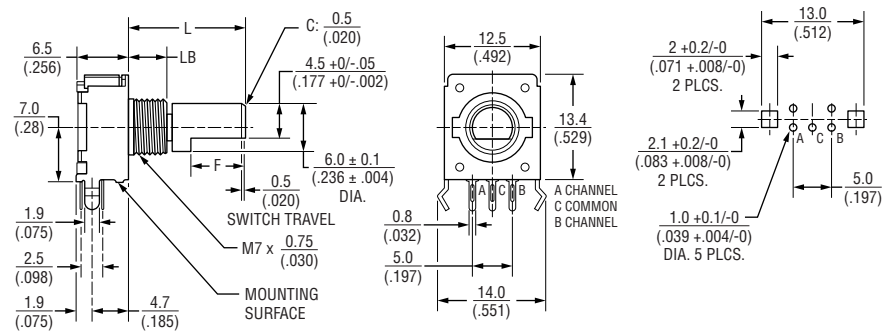


### Product Dimensions

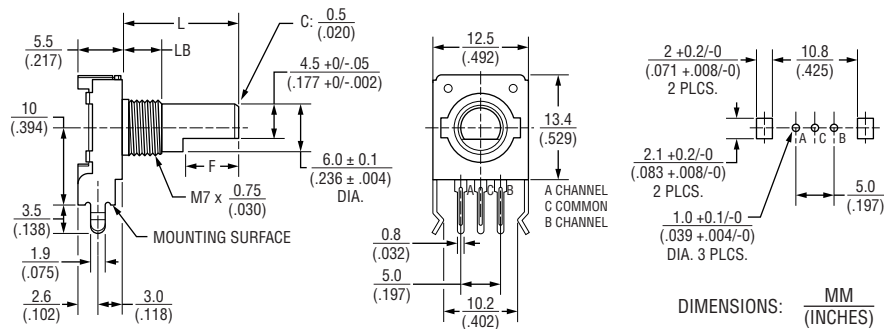
#### PEC11R-1xxxF-Nxxxx



#### PEC11R-1xxxF-Sxxxx



#### PEC11R-2xxxF-Nxxxx



DIMENSIONS: MM (INCHES)

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



### 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:

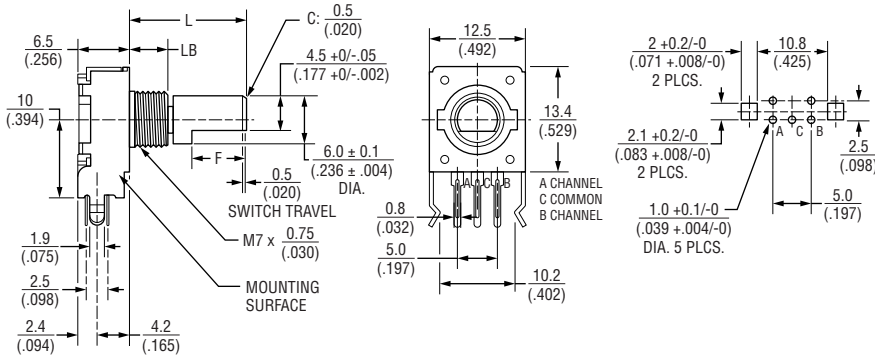
- Audio-visual equipment
- Consumer electric appliances
- Radios
- Musical instrumentation
- Communications equipment

## PEC11R Series - 12 mm Incremental Encoder

**BOURNS®**

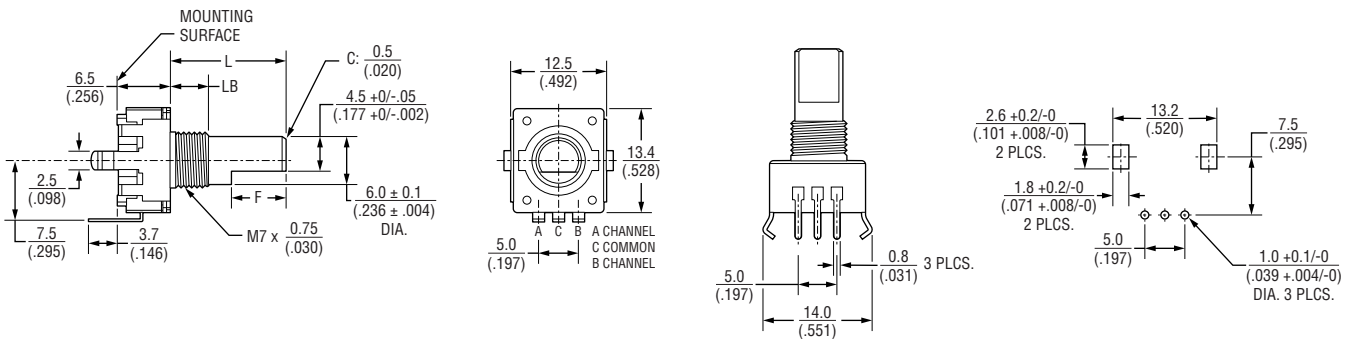
### Product Dimensions (continued)

#### PEC11R-2xxxF-Sxxxx

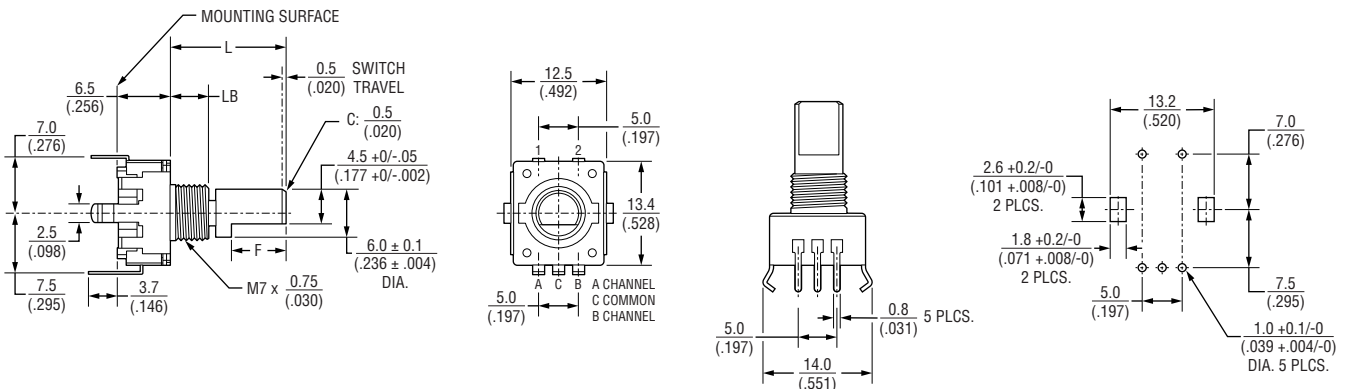


|             |   |
|-------------|---|
| DIMENSIONS: | $\frac{\text{MM}}{\text{(INCHES)}}$                         |
| TOLERANCE:  | $\frac{<10}{(<.400)} = \frac{\pm 0.3}{(\pm 0.012)}$         |
|             | $\frac{\geq 10}{(\geq .400)} = \frac{\pm 0.5}{(\pm 0.020)}$ |

#### PEC11R-4xxxF-Nxxxx



#### PEC11R-4xxxF-Sxxxx



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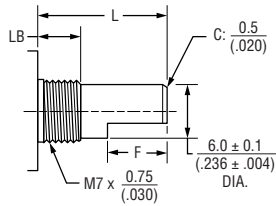
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# PEC11R Series - 12 mm Incremental Encoder



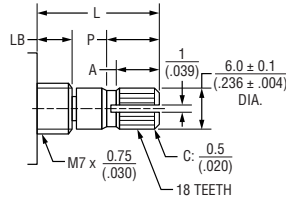
## Shaft Dimensions

### Flatted Shaft



| L             | LB          | F            |
|---------------|-------------|--------------|
| 15<br>(.591)  | 5<br>(.197) | 7<br>(.276)  |
| 20<br>(.787)  | 7<br>(.276) | 10<br>(.394) |
| 25<br>(.984)  | 7<br>(.276) | 12<br>(.472) |
| 30<br>(1.181) | 7<br>(.276) | 12<br>(.472) |

### Knurled Shaft



### Knurled Shaft Without Switch

| L             | LB          | P            | A            |
|---------------|-------------|--------------|--------------|
| 15<br>(.591)  | 5<br>(.197) | 8<br>(.315)  | 6<br>(.236)  |
| 20<br>(.787)  | 7<br>(.276) | 7<br>(.276)  | 6<br>(.236)  |
| 25<br>(.984)  | 7<br>(.276) | 12<br>(.472) | 10<br>(.394) |
| 30<br>(1.181) | 7<br>(.276) | 16<br>(.630) | 12<br>(.472) |

### Knurled Shaft With Switch

| L             | LB          | P            | A            |
|---------------|-------------|--------------|--------------|
| 15<br>(.591)  | 5<br>(.197) | 7<br>(.276)  | 6<br>(.236)  |
| 20<br>(.787)  | 7<br>(.276) | 7<br>(.276)  | 6<br>(.236)  |
| 25<br>(.984)  | 7<br>(.276) | 12<br>(.472) | 10<br>(.394) |
| 30<br>(1.181) | 7<br>(.276) | 16<br>(.630) | 12<br>(.472) |

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

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

## How To Order

PEC11R 4 0 20 F - S 0012

Model \_\_\_\_\_

Terminal Configuration \_\_\_\_\_  
 1 = PC Pin Vertical / Side Facing 7 mm    4 = PC Pin Horizontal / Rear Facing  
 2 = PC Pin Vertical / Side Facing 10 mm

Detent Option \_\_\_\_\_  
 0 = No Detents (12, 18, 24 pulses)    2 = 24 Detents (12, 24 pulses)  
 1 = 18 Detents (18 pulses)    3 = 12 Detents (12, 24 pulses)

Standard Shaft Length \_\_\_\_\_  
 15 = 15.0 mm    25 = 25.0 mm  
 20 = 20.0 mm    30 = 30.0 mm

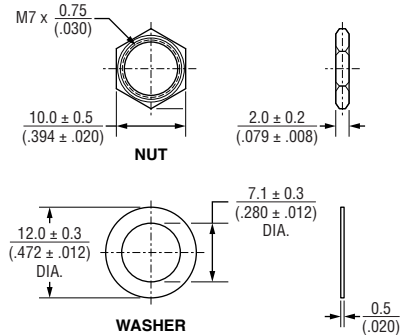
Shaft Style \_\_\_\_\_  
 F = Metal Flatted Shaft    K = Metal Knurled Shaft<sup>1</sup>

Switch Configuration \_\_\_\_\_  
 S = Push Momentary Switch    N = No Switch

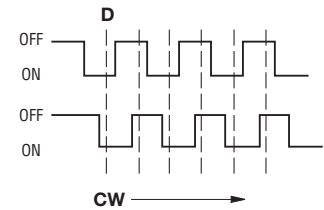
Resolution \_\_\_\_\_  
 0012 = 12 Pulses per 360 ° Rotation    0024 = 24 Pulses per 360 ° Rotation  
 0018 = 18 Pulses per 360 ° Rotation

<sup>1</sup>Metal knurled shaft without switch is available in 15, 20 and 30 mm shaft lengths.  
 Metal knurled shaft with push momentary switch is available in 15 and 20 mm shaft lengths.

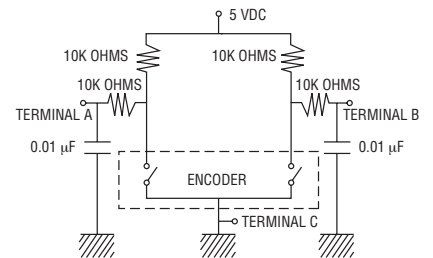
## Hardware



## Quadrature Output Table



## Suggested Filter Circuit



## Switch Circuit



REV. 04/26

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