

## Features

- Push switch option
- Compact, rugged design
- High reliability
- Metal bushing/shaft



## PEC11R Series - 12 mm Incremental Encoder

### Electrical Characteristics

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

### Mechanical Characteristics

|                               |   |
|-------------------------------|---|
| Mechanical Angle.....         | 360 ° continuous  |
| Torque                        |   |
| Running.....                  | 50 to 200 gf.cm (0.68 to 2.7 oz.-in.)                                   |
| Mounting.....                 | 10.2 kgf.cm (8.83 lb.-in.) maximum                                      |
| Shaft Side Load (Static)..... | 2.04 kgf (4.5 lbs.) minimum   |
| Weight.....                   | 5 gm (0.17 oz.) maximum   |
| 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         |

### 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              |

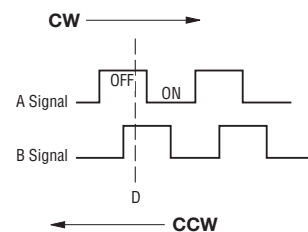
### How To Order

**PEC11R - 4 0 20 F - S 0012**

|                                      |  |
|--------------------------------------|--|
| Model.....                           |  |
| Terminal Configuration.....          |  |
| 4 = PC Pin Horizontal/Rear Facing    |  |
| Detent Option.....                   |  |
| 0 = No Detents (12, 18, 24 pulses)   |  |
| 1 = 18 Detents (18 pulses)           |  |
| 2 = 24 Detents (12, 24 pulses)       |  |
| 3 = 12 Detents (12, 24 pulses)       |  |
| Standard Shaft Length.....           |  |
| 15 = 15.0 mm                         |  |
| 20 = 20.0 mm                         |  |
| 25 = 25.0 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  |  |
| 0018 = 18 Pulses per 360 ° Rotation  |  |
| 0024 = 24 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.

### Quadrature Output Table



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

\*\*Devices are tested using standard noise reduction filters. For optimum performance, designers should use noise reduction filters in their circuits.

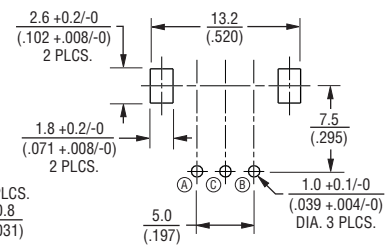
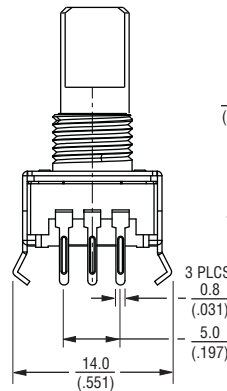
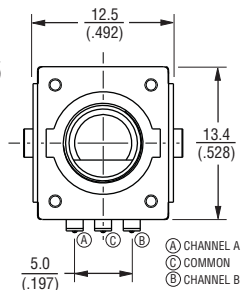
Specifications are subject to change without notice.

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.

Level control, tuning and timer settings in:

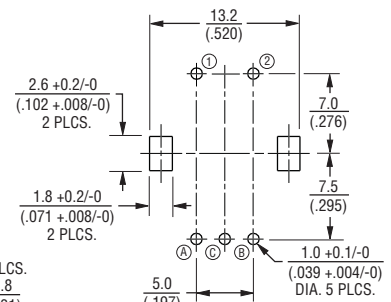
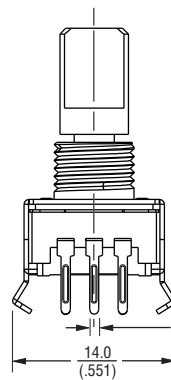
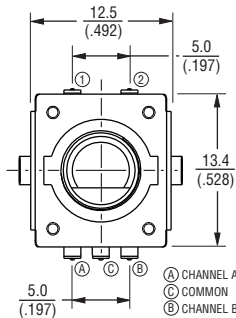
- ## PEC11R Series - 12 mm Incremental Encoder

## Product Dimensions

[illegible]

Technical drawing of a switch assembly showing dimensions and labels:

- Dimensions:**
  - 6.5 (.256)
  - 7.0 (.276)
  - 7.5 (.295)
  - 2.5 (.098)
  - 3.7 (.146)
  - LB
  - L
  - 0.5 (.020)
  - 0.5 (.020)
  - 0.5 (+0/-0.002) (.177 +0/-0.002)
  - 4.5 (+0/-0.05) (.177 +0/-0.002)
  - 6.0 (.236)
  - F
  - P
  - C
- Labels:**
  - SWITCH TRAVEL
  - M7 X 0.75 (.030)
  - DIA.
  - MOUNTING SURFACE



## Switch Circuit



The diagram shows a 5VDC supply connected to a bridge of four 10K OHMS resistors. The bridge outputs are connected to TERMINAL A, TERMINAL B, and TERMINAL C. Each output line has a 0.01 μF capacitor to ground. The encoder is connected to the bridge outputs and ground.

TOLERANCES:  $< \frac{10}{(.394)} = \pm \frac{0.3}{(.012)}$   
 $\geq \frac{10}{(.394)} = \pm \frac{0.5}{(.020)}$

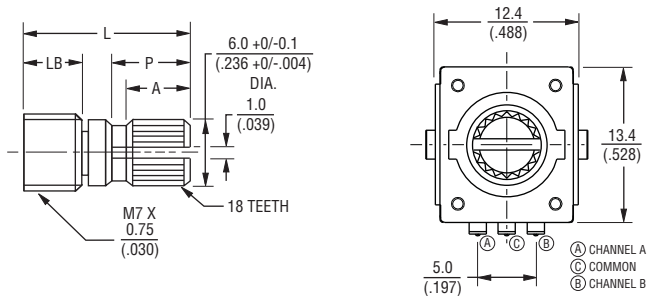
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

# PEC11R Series - 12 mm Incremental Encoder

**BOURNS®**

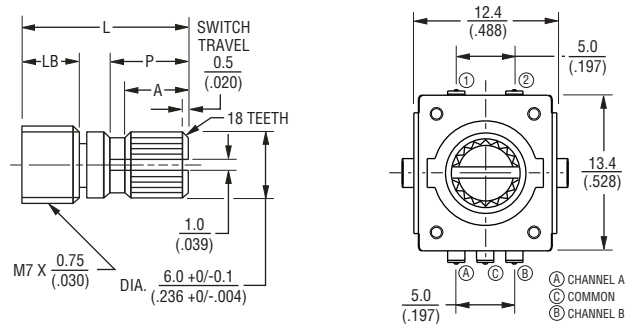
## Product Dimensions

### PEC11R-4xxxK-Nxxxx



| L             | LB            | P              | A              |
|---------------|---------------|----------------|----------------|
| 15<br>(.591)  | 5.0<br>(.197) | 7.0<br>(.276)  | 6.0<br>(.236)  |
| 20<br>(.787)  | 7.0<br>(.276) | 7.0<br>(.276)  | 6.0<br>(.236)  |
| 30<br>(1.181) | 7.0<br>(.276) | 16.0<br>(.630) | 12.0<br>(.472) |

### PEC11R-4xxxK-Sxxxx



| L            | LB            | P             | A             |
|--------------|---------------|---------------|---------------|
| 15<br>(.591) | 5.0<br>(.197) | 7.0<br>(.276) | 6.0<br>(.236) |
| 20<br>(.787) | 7.0<br>(.276) | 7.0<br>(.276) | 6.0<br>(.236) |

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

TOLERANCES:  $< \frac{10}{(.394)} = \pm \frac{0.3}{(.012)}$   
 $\geq \frac{10}{(.394)} = \pm \frac{0.5}{(.020)}$

**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)

REV. 07/14

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.