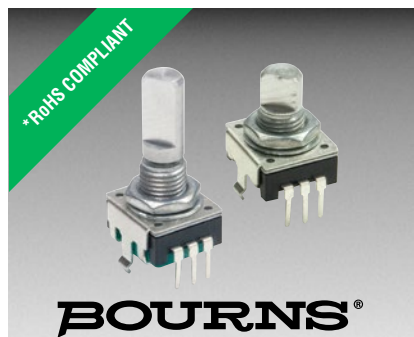




## Features

- 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..... | 300 VAC minimum       |
| Sea Level.....                       | Continuous            |
| Electrical Travel.....               | 2.0 ms maximum**      |
| Contact Bounce (15 RPM).....         | 60 maximum**          |
| RPM (Operating).....                 |                       |

### 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.....                   |                                                                         |
| 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.....                   | 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

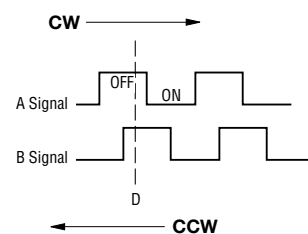
|                                    |                                    |
|------------------------------------|------------------------------------|
| Switch Type.....                   | Contact Push ON Momentary SPST     |
| Power Rating (Resistive Load)..... | 10 mA at 5 V DC                    |
| 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

|                             |                                                                                                                                      |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Model.....                  | PEC11R - 4 0 20 F - S 0012                                                                                                           |
| Terminal Configuration..... | 4 = PC Pin Horizontal/Rear Facing                                                                                                    |
| Detent Option.....          | 0 = No Detents (12, 18, 24 pulses)<br>1 = 18 Detents (18 pulses)<br>2 = 24 Detents (12, 24 pulses)<br>3 = 12 Detents (12, 24 pulses) |
| Standard Shaft Length.....  | 15 = 15.0 mm<br>20 = 20.0 mm<br>25 = 25.0 mm<br>30 = 30.0 mm                                                                         |
| Shaft Style.....            | F = Metal Flatted Shaft<br>K = Metal Knurled Shaft <sup>1</sup>                                                                      |
| Switch Configuration.....   | S = Push Momentary Switch<br>N = No Switch                                                                                           |
| Resolution.....             | 0012 = 12 Pulses per 360 ° Rotation<br>0018 = 18 Pulses per 360 ° Rotation<br>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.

## Applications

Level control, tuning and timer settings in:

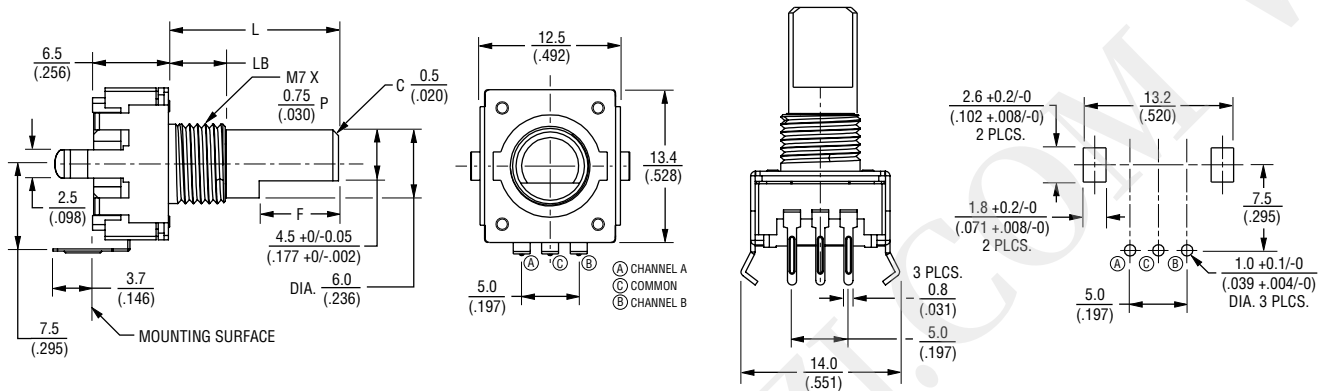
- Audio-visual equipment
- Consumer electric appliances
- Radios
- Musical instrumentation
- Communications equipment

## PEC11R Series - 12 mm Incremental Encoder

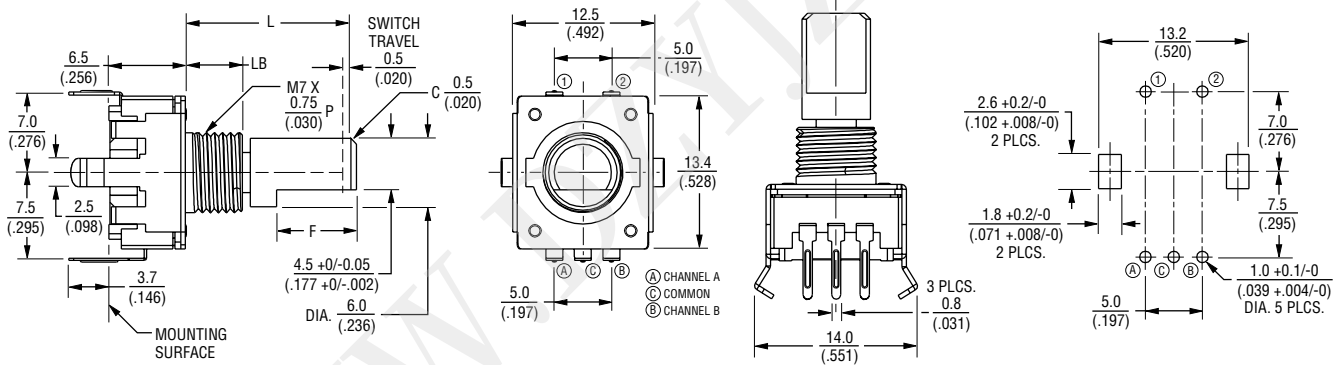
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### Product Dimensions

#### PEC11R-4xxxF-Nxxxx



#### PEC11R-4xxxF-Sxxxx

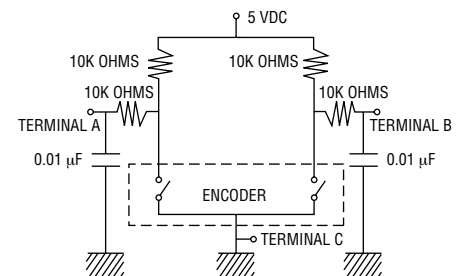


| L             | LB            | F              |
|---------------|---------------|----------------|
| 15<br>(.591)  | 5.0<br>(.197) | 7.0<br>(.276)  |
| 20<br>(.787)  | 7.0<br>(.276) | 10.0<br>(.394) |
| 25<br>(.984)  | 7.0<br>(.276) | 12.0<br>(.472) |
| 30<br>(1.181) | 7.0<br>(.276) | 12.0<br>(.472) |

#### Switch Circuit



#### Suggested Filter Circuit



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

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

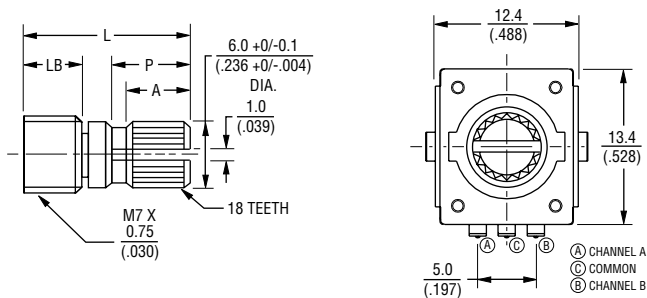
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# PEC11R Series - 12 mm Incremental Encoder

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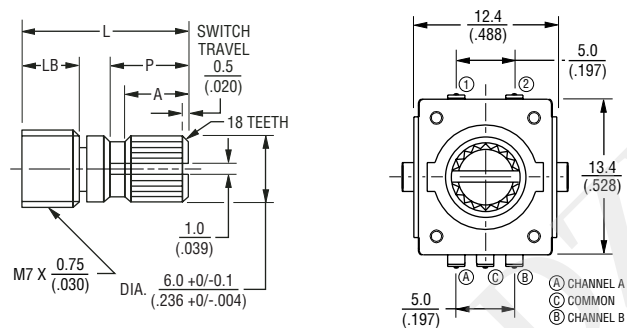
## Product Dimensions

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

REV. 11/16

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