PEC12R - 12 mm Incremental Encoder

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

**Electrical Characteristics**
- Output: 2-bit quadrature code
- Contact Rating: 10 mA @ 5 V DC
- Insulation Resistance: 10 megohms @ 250 V DC
- Dielectric Withstanding Voltage: 50 VAC minimum
- Sea Level: MIL-STD-202, Method 103B, Condition B
- Shock: 10-55-10 Hz / 1 min. / Amplitude 1.5 mm
- Rotational Life: 30,000 cycles minimum
- Switch Life: 20,000 cycles minimum
- IP Rating: IP 40
- Moisture Sensitivity Level: N/A
- ESD Classification (HBM): 1
- Contact Push ON Momentary SPST
- Voltage: 50 VAC minimum
- Current: 10 mA @ 5 VDC
- Temperature Range: -40 °C to +85 °C (-40 °F to +185 °F)
- Humidity: 93% maximum**
- Torque: 100 G
- Metal flat: 5/Ag2
- Sn95.5/Au2.8/Cu0.7 solder with no-clean flux:
  - 260 °C max. for 3 ± 1 sec.
- Wave Soldering: Not recommended

**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)
- Relative Humidity: Sea Level: 93% maximum**
- Temperature Range: -30 °C to +70 °C (-22 °F to +158 °F)
- Humidity: 93% maximum**
- Torque: 100 G
- Metal flat: 5/Ag2
- Sn95.5/Au2.8/Cu0.7 solder with no-clean flux:
  - 260 °C max. for 3 ± 1 sec.
- Wave Soldering: Not recommended

**Mechanical Characteristics**
- Mechanical Angle: 360 ° continuous
- Torque: 2.04 kgf-cm (4.5 lbs-in.) minimum
- Running: 10 to 70 gf-cm (0.14 to 0.97 oz-in)
- Shaft Side Load (Static): 3 gm (0.1 oz.) maximum
- Weight: 2 kgf-cm (8.83 lb-in.) maximum
- Terminals: Printed circuit board terminals
- Terminals: Printed circuit board terminals
- Soldering Condition: N/A
- Wave Soldering: Sn95.5/Au2.8/Cu0.7 solder with no-clean flux:
  - 260 °C max. for 3 ± 1 sec.
- Hand Soldering: Not recommended

**Switch Characteristics**
- Switch Type: Contact Push ON Momentary SPST
- Power Rating (Resistive Load): 10 mA @ 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**

<table>
<thead>
<tr>
<th>Model</th>
<th>Terminal/Bushing Configuration</th>
<th>Detent Option</th>
<th>Standard Shaft Length</th>
<th>Shaft Style</th>
<th>Switch Configuration</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEC12R - 4 0 20 F - S 0012</td>
<td>2 = Vertical Mount - Radial PC Pin/No Bushing</td>
<td>0 = No Detents</td>
<td>15 = 15.0 mm (Horizontal Mount/No Bushing only)</td>
<td>F = Insulated Flatted Shaft</td>
<td>S = Push Momentary Switch</td>
<td>0012 = 12 Pulses per 360 ° Rotation</td>
</tr>
<tr>
<td></td>
<td>3 = Horizontal Mount - Axial PC Pin/With Bushing</td>
<td>1 = 12 Detents (available with 12 pulses only)</td>
<td>17 = 17.5 mm</td>
<td>22 = 22.5 mm</td>
<td>N = No Switch</td>
<td>0024 = 24 Pulses per 360 ° Rotation</td>
</tr>
<tr>
<td></td>
<td>4 = Horizontal Mount - Axial PC Pin/No Bushing</td>
<td>2 = 24 Detents</td>
<td>20 = 20.0 mm</td>
<td>25 = 25.0 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 = 30.0 mm</td>
<td>5 ± 0.3 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Additional Information**

- Click these links for more information:
  - PRODUCT
  - TECHNICAL
  - INVENTORY
  - SAMPLES
  - CONTACT

**Quadrate Output Table**

<table>
<thead>
<tr>
<th>CW</th>
<th>A Signal</th>
<th>ON</th>
<th>ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Signal</td>
<td>D</td>
<td>CCW</td>
<td></td>
</tr>
</tbody>
</table>

**Bourns**

Asia-Pacific:
Tel: +886-2 2562-4117
Email: asiacus@bourns.com
Europe:
Tel: +36 88 885 877
Email: eurocus@bourns.com
The Americas:
Tel: +1-951 781-5500
Email: americus@bourns.com
www.bourns.com

**WARNING**
Cancer and Reproductive Harm
www.P65Warnings.ca.gov

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

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)

Switch Circuit

Suggested Filter Circuit

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PEC12R - 12 mm Incremental Encoder

Product Dimensions

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

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

<table>
<thead>
<tr>
<th>L</th>
<th>17.5</th>
<th>20.0</th>
<th>22.5</th>
<th>25.0</th>
<th>30.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>17.5</td>
<td>20.0</td>
<td>22.5</td>
<td>25.0</td>
<td>30.0</td>
</tr>
<tr>
<td>LB</td>
<td>5.0</td>
<td>5.0</td>
<td>7.0</td>
<td>7.0</td>
<td>7.0</td>
</tr>
<tr>
<td>F</td>
<td>5.0</td>
<td>7.0</td>
<td>7.0</td>
<td>12.0</td>
<td>12.0</td>
</tr>
</tbody>
</table>

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PEC12R - 12 mm Incremental Encoder

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)

<table>
<thead>
<tr>
<th>DIMENSIONS:</th>
<th>MM (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>15.0 (.591)</td>
</tr>
<tr>
<td>LB</td>
<td>2.0 (.079)</td>
</tr>
<tr>
<td>F</td>
<td>5.0 (.197)</td>
</tr>
</tbody>
</table>

TOLERANCE:  

\[
\begin{align*}
\text{<10} & \quad \pm 0.3 \quad (\pm 0.012) \\
\text{>10} & \quad \pm 0.5 \quad (\pm 0.020)
\end{align*}
\]

REV. 07/21
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