PEL12D - 12 mm Encoder with Switch and Illuminated Shaft

Features
- Compact design, long life and high reliability
- Vertical and horizontal mount versions
- Momentary switch
- Dual LED design
- Flatted and knurled shaft styles
- Bushing and bushingless options

PEL12D - 4 0 21 F - S 1 024

Electrical Characteristics
- Output: 2-bit quadrature code
- Closed Circuit Resistance: 3 ohms maximum
- Contact Rating: 0.5 mA @ 5 VDC
- Insulation Resistance: 100 megoohms @ 250 VDC
- Dielectric Withstanding Voltage: ±200 gf (15.9 ±7.0 oz.)
- Switch Actuation Force: 450 ± 200 gf (15.9 ±7.0 oz.)
- Switch Travel: 0.5 +0.0/-0.3 mm
- Contact Resistance: 100 milliohms
- Power Rating (Resistive Load): 10 mA at 5 V DC
- Terminals: Printed circuit board terminals
- Soldering Condition: Sn95.5/Aga2.0/Cu0.7 solder with no-clean flux: 260 °C max. for 5 ± 1 seconds
- Hardware: One flat washer and one mounting nut supplied with each encoder with bushing

Environmental Characteristics
- Operating Temperature Range: -10 °C to +70 °C (+14 °F to +158 °F)
- Storage Temperature Range: -40 °C to +85 °C (-40 °F to +185 °F)
- Operating Humidity: 25 % to 85 % R.H.
- Rotational Life: 30,000 cycles minimum
- Switch Life: 20,000 cycles minimum
- IP Rating: IP 40

Mechanical Characteristics
- Mechanical Angle: 360 ° continuous
- Detent Torque: 30 to 200 g-cm (0.42 to 2.77 oz.-in.)
- Running Torque: 50 g-cm (0.69 oz.-in.) maximum
- Shaft Strength (Push): 5 kgf (11.0 lbs.)
- Shaft Strength (Pull): 10 kgf (22.0 lbs.)
- Weight: 3 gm (0.1 oz.) maximum
- Terminals: Printed circuit board terminals
- Switch Type: Contact Push ON Momentary SPST
- Power Rating (Resistive Load): 10 mA at 5 V DC
- Contact Resistance: 100 milliohms
- Switch Travel: 0.5 +0.0/-0.3 mm
- Switch Actuation Force: 450 ± 200 gf (15.9 ±7.0 oz.)

How To Order

Model

Terminal Configuration
- Model: PEL12D - 4 0 21 F - S 1 024
- Terminal Configuration:
  - 2 = Vertical Mount/Side Exit PC Pin
  - 4 = Horizontal Mount/Rear Exit PC Pin
- 0 = No Detents
- 2 = 24 Detents
- Standard Shaft Length
  - Flatted: 16 = 16.0 mm, 28 = 26.0 mm, 25 = 25.0 mm
  - Knurled: 18 = 18.5 mm, 31 = 31.0 mm
- Shaft Style
  - F = Insulated Flatted Shaft
  - G = Insulated Flatted Shaft w/Bushing
  - S = Insulated Knurled Shaft (18 Teeth)
  - T = Insulated Knurled Shaft (18 Teeth) w/Bushing
- Switch Configuration
  - S = Push Momentary Switch
- LED Color
  - Dual:
    - 1 = Blue/Orange
    - 2 = Green/Red
    - 3 = Blue/Green
- Resolution
  - 024 = 24 Pulses per 360 ° Rotation

*** Available in 18.5, 21 and 26 mm shaft lengths

* 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
- Musical instrumentation
- Communications equipment

PEL12D - 12 mm Encoder with Switch and Illuminated Shaft

Product Dimensions

PEL12D-4xxxS-Sxxxx (Horizontal Mount w/Dual LED & Switch, Knurled Shaft)

PEL12D-4xxxF-Sxxxx (Horizontal Mount w/Dual LED & Switch, Flatted Shaft)

Dual LED Circuit

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Product Dimensions

PEL12D-2xxxS-Sxxxx (Vertical Mount w/Dual LED & Switch, Knurled Shaft)

Dimensions: MM (INCHES)

PEL12D-2xxxF-Sxxxx (Vertical Mount w/Dual LED & Switch, Flatted Shaft)

Dimensions: MM (INCHES)

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Downloaded from Arrow.com.
### LED Characteristics (Dual)

<table>
<thead>
<tr>
<th>LED Color</th>
<th>Power Dissipation (mW)</th>
<th>DC Forward Current (mA)</th>
<th>Forward Voltage (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blue/Orange</strong></td>
<td>Blue</td>
<td>105</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Orange</td>
<td>75</td>
<td>30</td>
</tr>
<tr>
<td><strong>Green/Red</strong></td>
<td>Green</td>
<td>120</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>75</td>
<td>30</td>
</tr>
<tr>
<td><strong>Blue/Green</strong></td>
<td>Blue</td>
<td>120</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>120</td>
<td>30</td>
</tr>
<tr>
<td><strong>Red/Green</strong></td>
<td>Red</td>
<td>75</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td>120</td>
<td>30</td>
</tr>
</tbody>
</table>

**Notes:**
- Reverse Current: 10 μA
- Reverse Voltage: 5 VDC
- Test Condition (IF): 20 mA

### Quadrature Output Table

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

### Suggested Filter Circuit

```
5 VDC
10K OHMS 10K OHMS
TERMINAL A
TERMINAL C
TERMINAL B
0.01 μF
0.01 μF
ENCODER
```

### LED Terminal Decoder

<table>
<thead>
<tr>
<th>Code</th>
<th>Color</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blue / Orange</td>
<td>① ② / ① ③</td>
</tr>
<tr>
<td>2</td>
<td>Green / Red</td>
<td>① ② / ① ③</td>
</tr>
<tr>
<td>3</td>
<td>Blue / Green</td>
<td>① ② / ① ③</td>
</tr>
</tbody>
</table>

### Specifications

- **LED Color** and **Terminals**
- **Power Dissipation** and **DC Forward Current**
- **Forward Voltage** (Typ. and Max.)

**Notes:**
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