

## 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 - 12 mm Encoder with Switch and Illuminated Shaft

### Electrical Characteristics

Output.....	2-bit quadrature code
Closed Circuit Resistance .....	3 ohms maximum
Contact Rating.....	0.5 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) .....	100 maximum**

### 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
Soldering Condition	
Wave Soldering.....	Sn95.5/Ag2.8/Cu0.7 solder with no-clean flux: 260 °C max. for 5 ± 1 seconds
Hand Soldering .....	Not recommended
Hardware .....	No hardware supplied

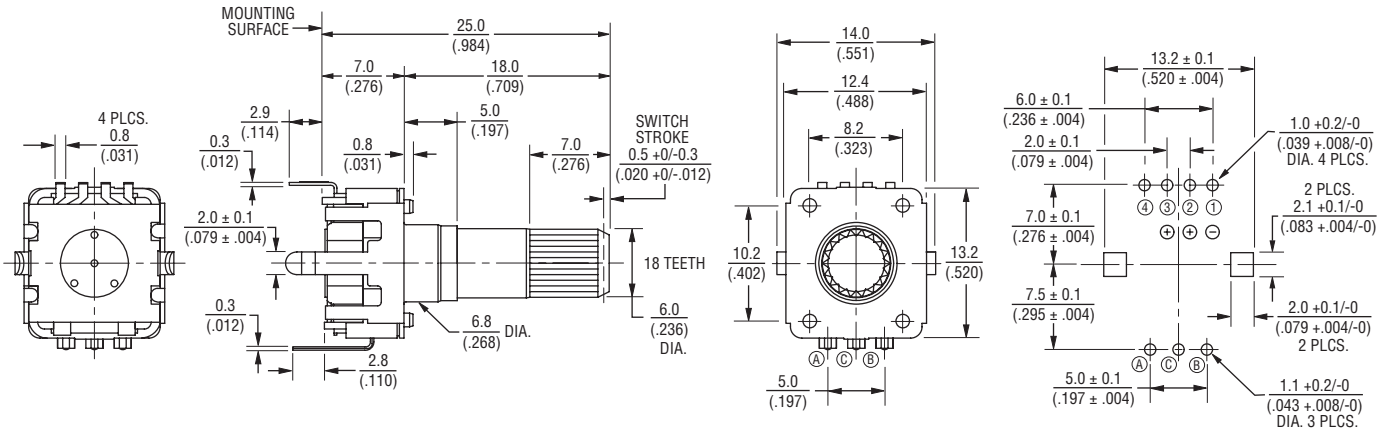
### Switch Characteristics

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.)

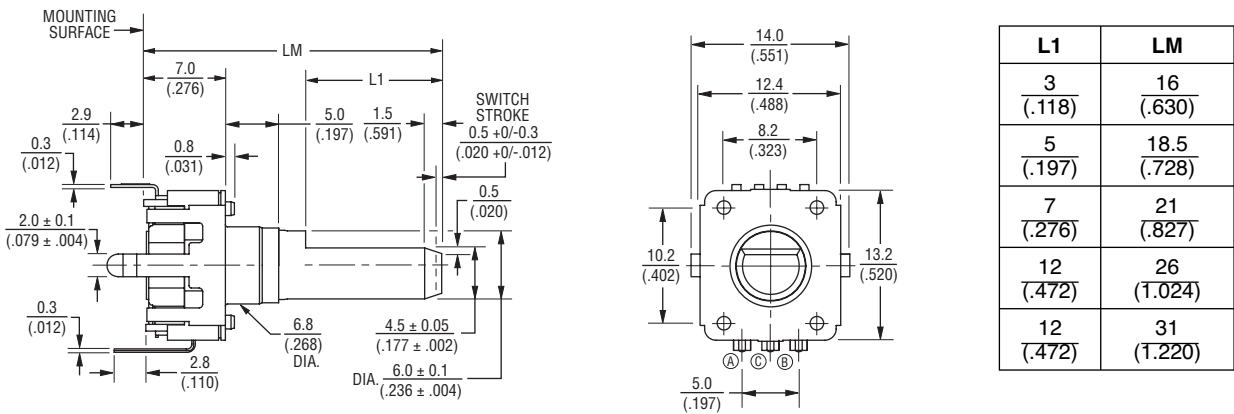
\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

## Product Dimensions

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



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



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

Specifications are subject to change without notice. Customers should verify actual device performance in their specific applications.

TOLERANCES:  
 UNDER  $\frac{10.0}{.394} = \frac{+0.3}{(\pm .012)}$   $\frac{10.0 - 100}{.394 - 3.937} = \frac{+0.5}{(\pm .020)}$

## How To Order

**PEL12D - 4 0 21 F - S 1 024**

Model \_\_\_\_\_

Terminal Configuration \_\_\_\_\_  
 2 = Vertical Mount/Side Exit PC Pin      4 = Horizontal Mount/Rear Exit PC Pin

Detent Option \_\_\_\_\_  
 0 = No Detents      2 = 24 Detents

Standard Shaft Length \_\_\_\_\_  
 Flatted:      Knurled:  
 16 = 16.0 mm      26 = 26.0 mm  
 18 = 18.5 mm      31 = 31.0 mm  
 21 = 21.0 mm

Shaft Style \_\_\_\_\_  
 F = Insulated Flatted Shaft      S = Insulated Knurled Shaft (18 Teeth)  
 G = Insulated Flatted Shaft w/Bushing\*\*\*      T = Insulated Knurled Shaft (18 Teeth) w/Bushing

Switch Configuration \_\_\_\_\_  
 S = Push Momentary Switch

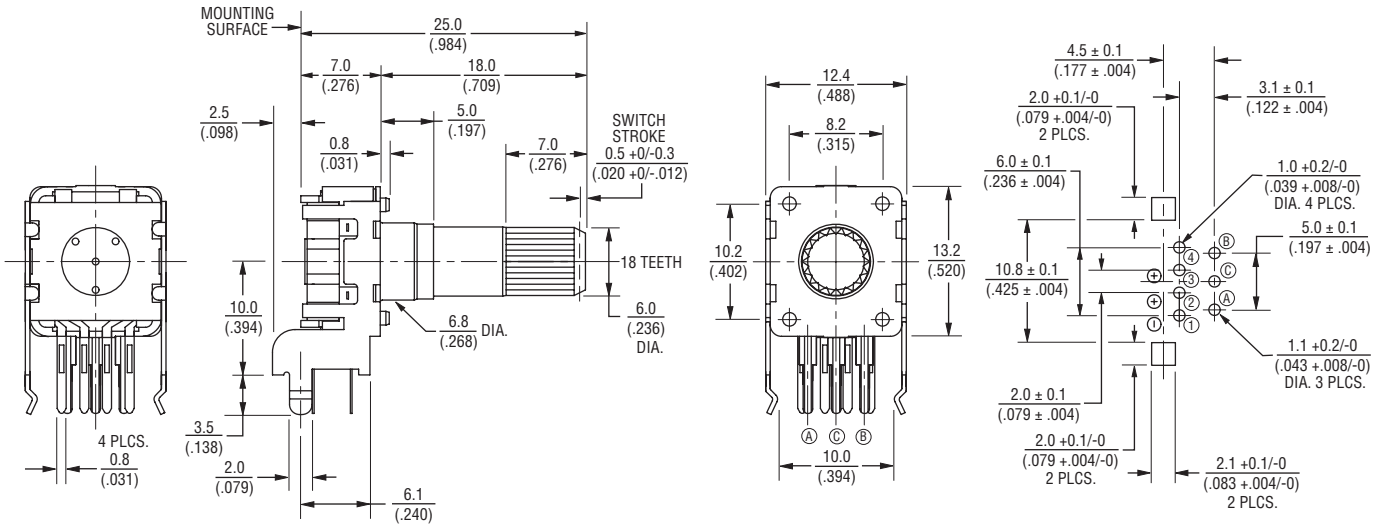
LED Color \_\_\_\_\_  
 Dual:  
 1 = Blue/Orange  
 2 = Green/Red  
 3 = Blue/Green

Resolution \_\_\_\_\_  
 024 = 24 Pulses per 360 ° Rotation

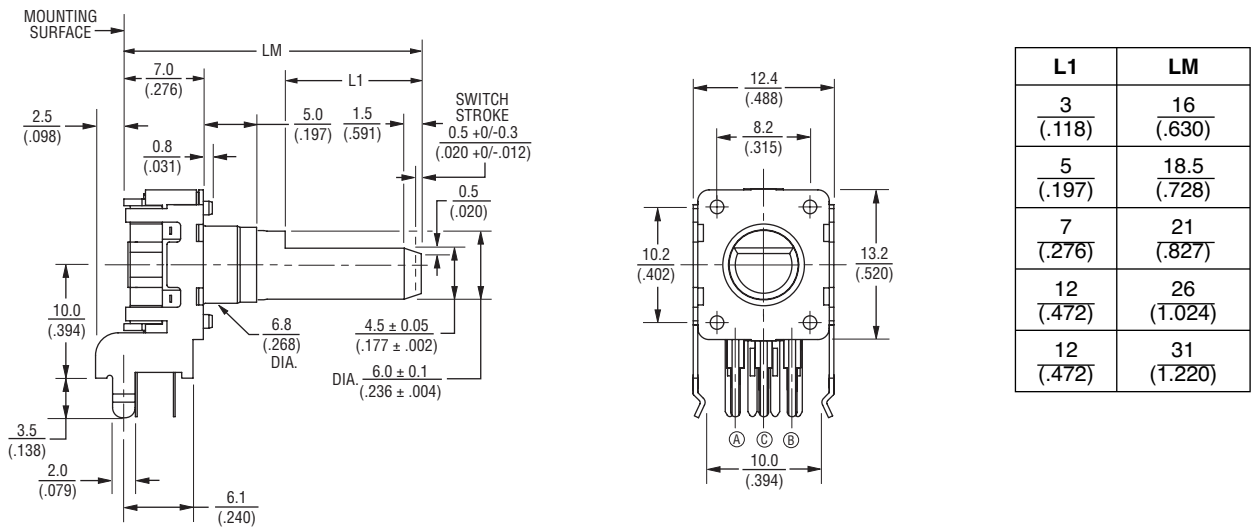
\*\*\* Available in 18.5, 21 and 26 mm shaft lengths

**Product Dimensions**

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



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



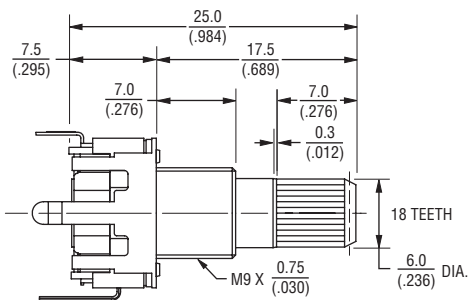
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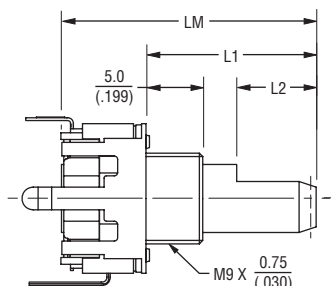
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## Product Dimensions

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



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

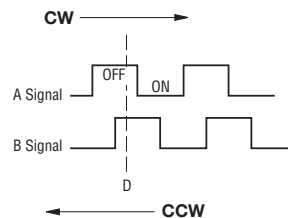


L2	L1	LM
5 (.197)	11 (.433)	18.5 (.728)
7 (.276)	13.5 (.532)	21 (.827)
12 (.472)	18.5 (.728)	26 (1.024)

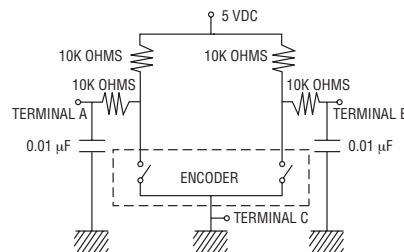
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## Quadrature Output Table



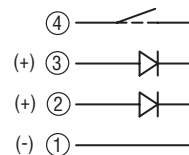
## Suggested Filter Circuit



## LED Terminal Decoder

Code	Color	Terminals
1	Blue / Orange	① ② / ① ③
2	Green / Red	① ② / ① ③
3	Blue / Green	① ② / ① ③

## Dual LED Circuit



## Applications

Level control, tuning and timer settings in:

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

### Notes:

Reverse Current: 10  $\mu$ A  
 Reverse Voltage: 5 VDC  
 Test Condition (IF): 20 mA

REV. 05/12

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For more information about this product, visit our website at:

[www.potentiometers.com](http://www.potentiometers.com)