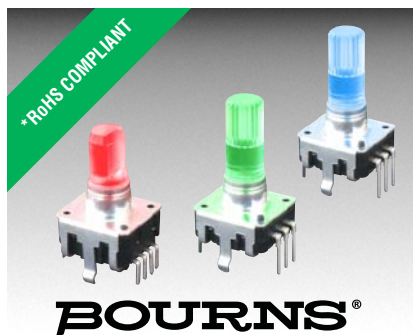




Features

- 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.)

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	25 = 25.0 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

*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.

Customers should verify actual device performance in their specific applications.

Applications

Level control, tuning and timer settings in:

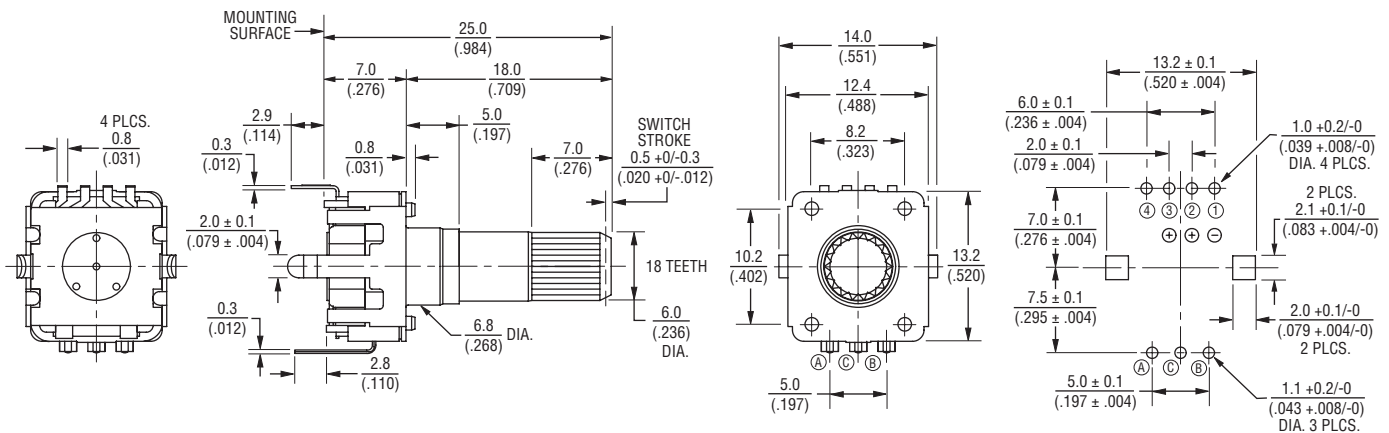
- Audio-visual equipment
- Consumer electric appliances
- Musical instrumentation
- Communications equipment

PEL12D - 12 mm Encoder with Switch and Illuminated Shaft

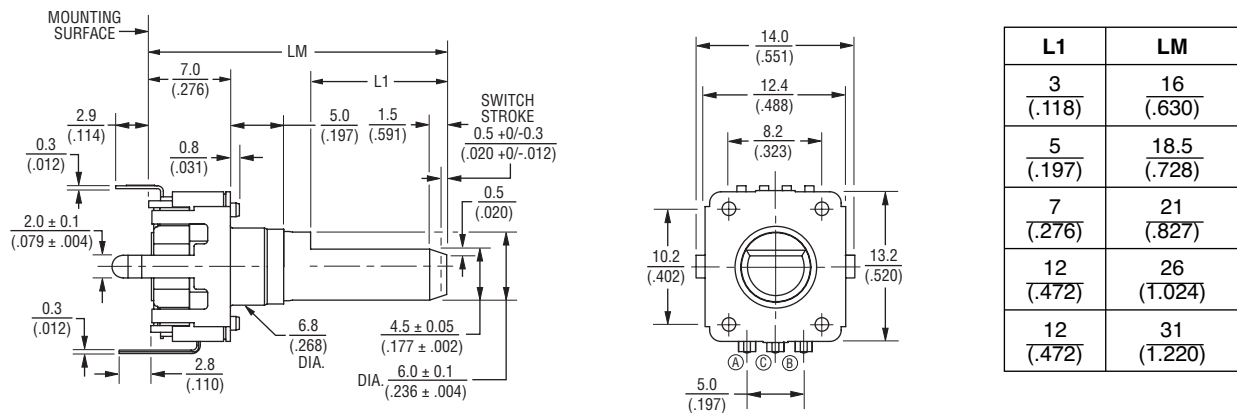
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Product Dimensions

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



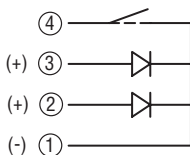
PEL12D-4xxxF-Sxxxx (Horizontal Mount w/Dual LED & Switch, Flatted Shaft)



L1	LM
3 (.118)	16 (.630)
5 (.197)	18.5 (.728)
7 (.276)	21 (.827)
12 (.472)	26 (1.024)
12 (.472)	31 (1.220)

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

Dual LED Circuit



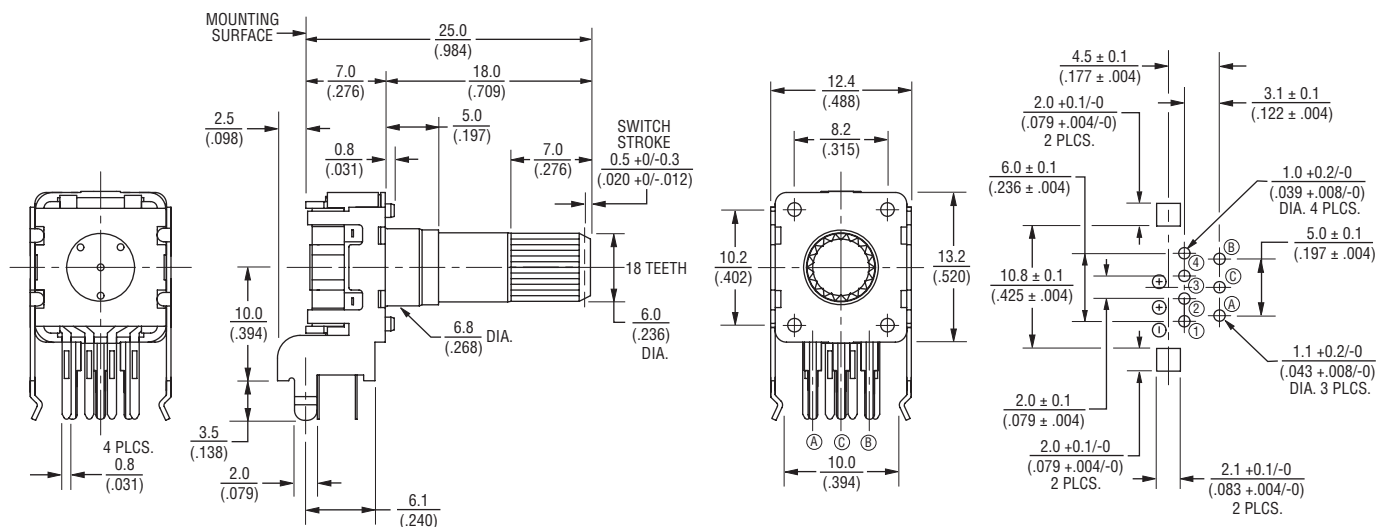
TOLERANCES:
 UNDER $\frac{10.0}{(.394)} = \frac{\pm 0.3}{(\pm 0.012)} \quad \frac{10.0 \sim 100}{(.394 \sim 3.937)} = \frac{\pm 0.5}{(\pm 0.020)}$

PEL12D - 12 mm Encoder with Switch and Illuminated Shaft

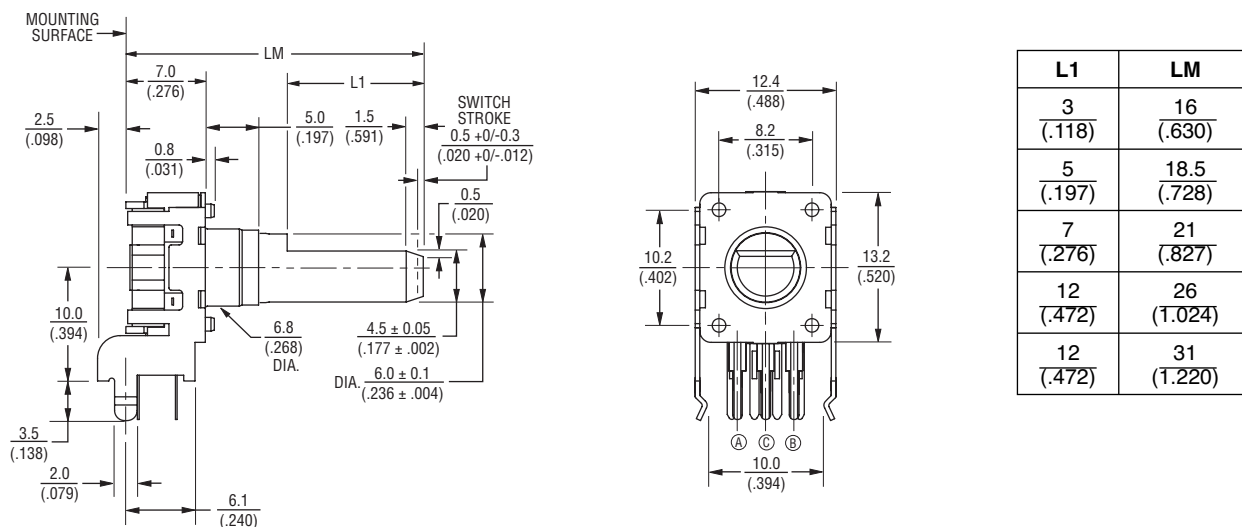
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Product Dimensions

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



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



L1	LM
3 (.118)	16 (.630)
5 (.197)	18.5 (.728)
7 (.276)	21 (.827)
12 (.472)	26 (1.024)
12 (.472)	31 (1.220)

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

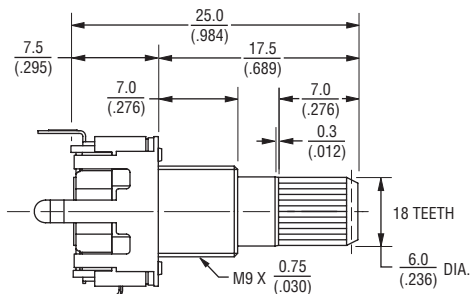
TOLERANCES:
 UNDER $\frac{10.0}{(.394)} = \frac{+0.3}{(\pm 0.012)} \quad \frac{10.0 \sim 100}{(.394 \sim 3.937)} = \frac{+0.5}{(\pm 0.020)}$

PEL12D - 12 mm Encoder with Switch and Illuminated Shaft

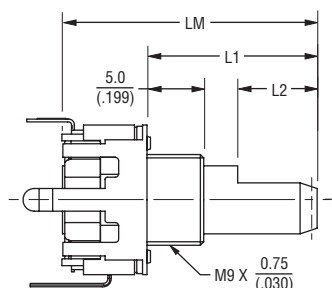
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Product Dimensions

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)

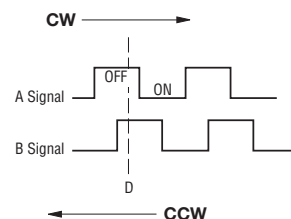


DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

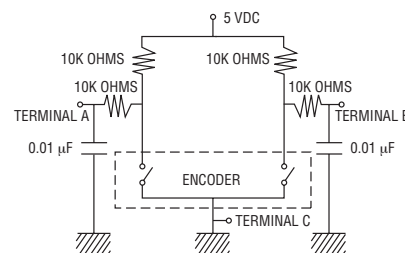
TOLERANCES:
 UNDER $\frac{10.0}{(.394)} = \frac{\pm 0.3}{(\pm .012)}$ $\frac{10.0 - 100}{(.394 - 3.937)} = \frac{\pm 0.5}{(\pm .020)}$

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)

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

LED Characteristics (Dual)

LED Color		Power Dissipation (mW)	DC Forward Current (mA)	Forward Voltage (V)	
				Typ.	Max.
Blue/ Orange	Blue	105	30	3.3	4.0
	Orange	75	30	2.1	2.5
Green/ Red	Green	120	30	3.2	4.0
	Red	75	30	1.95	2.5
Blue/ Green	Blue	120	30	3.3	4.0
	Green	120	30	3.2	4.0
Red/ Green	Red	75	30	1.95	2.5
	Green	120	30	3.2	4.0

Notes:

Reverse Current: 10 μ A
 Reverse Voltage: 5 VDC
 Test Condition (IF): 20 mA

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