

## Features

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



## PEC12R - 12 mm Incremental Encoder

### Electrical Characteristics

Output .....	2-bit quadrature code
Contact Rating .....	10 mA @ 5 VDC
Insulation Resistance .....	10 megohms @ 250 VDC
Dielectric Withstanding Voltage	
Sea Level .....	50 VAC minimum
Electrical Travel .....	Continuous
Contact Bounce (15 RPM) .....	2.0 ms. maximum**
RPM (Operating) .....	100 maximum**

### 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 .....	3 gm (0.1 oz.) maximum
Terminals .....	Printed circuit board terminals
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 with bushing

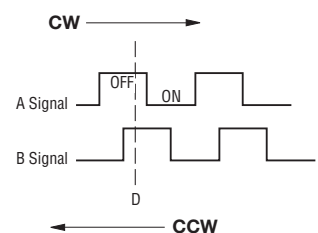
### Switch Characteristics

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

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

### 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. Users should verify actual device performance in their specific applications.

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**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

# Applications

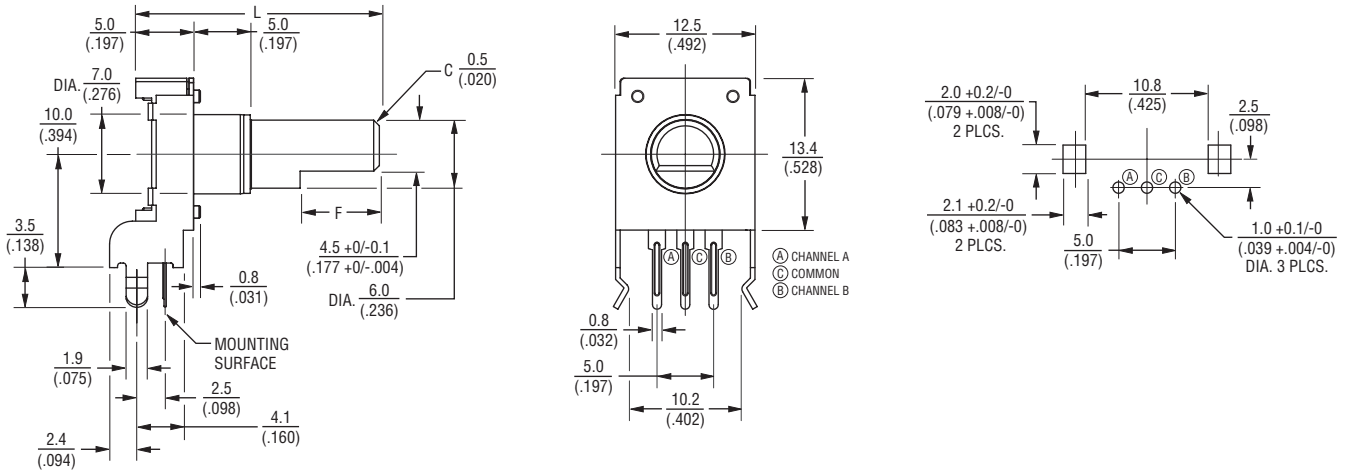
Level control, tuning and timer settings in:

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

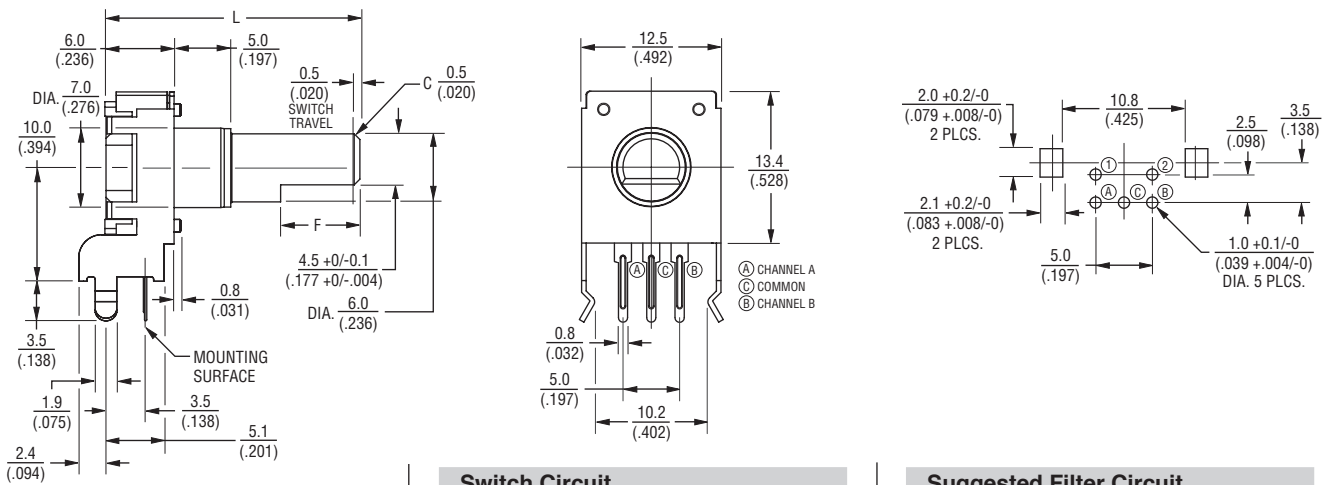
## PEC12R - 12 mm Incremental Encoder **BOURNS**®

### 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)



L	17.5 (.688)	20.0 (.787)	22.5 (.886)	25.0 (.984)	30.0 (1.181)
F	5.0 (.197)	7.0 (.276)	7.0 (.276)	12.0 (.472)	12.0 (.472)

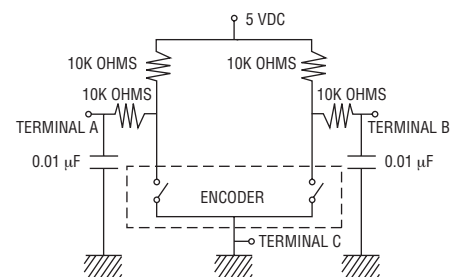
DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

TOLERANCE:  $\frac{<10}{(<.400)} = \pm 0.3$   
 $\frac{>=10}{(>=400)} = \pm 0.5$

#### Switch Circuit



#### Suggested Filter Circuit



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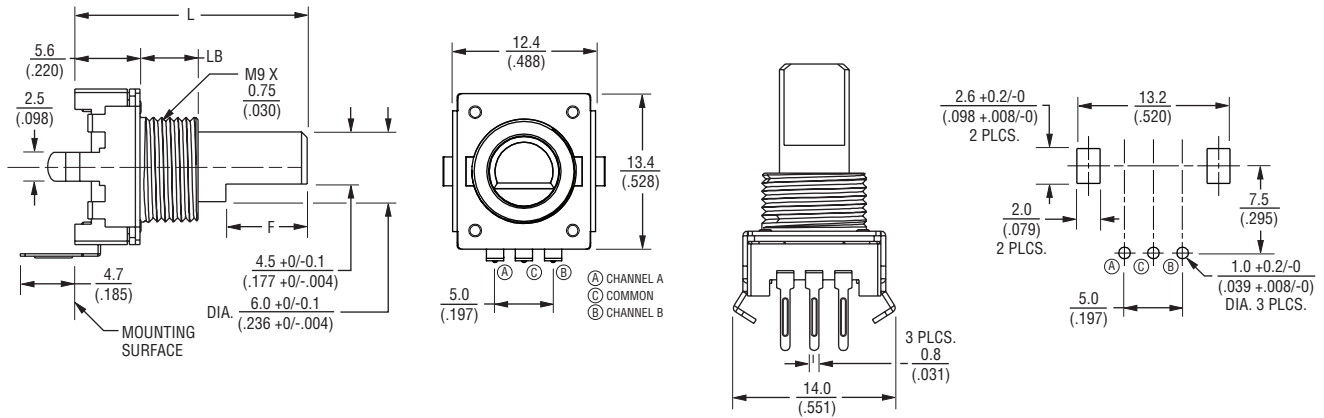
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# PEC12R - 12 mm Incremental Encoder

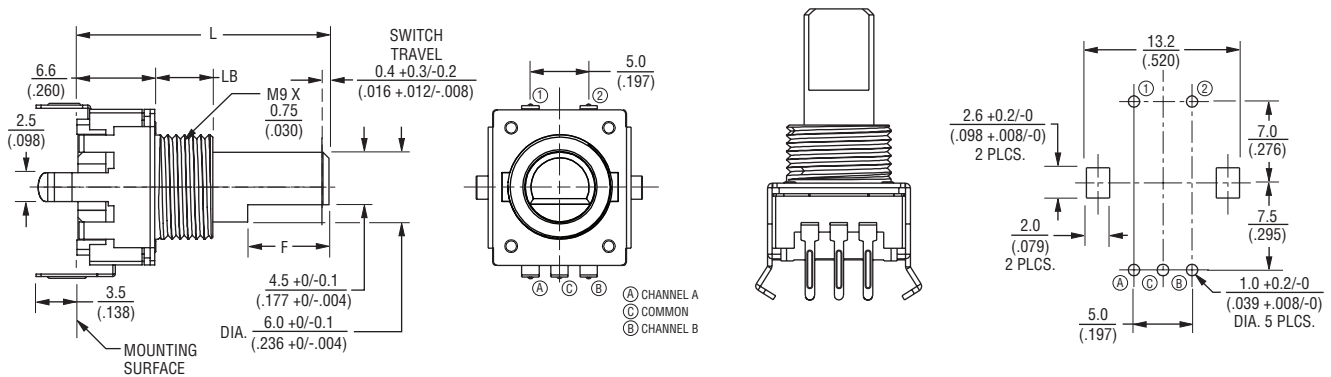
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## Product Dimensions

### 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)



L	$\frac{17.5}{(.688)}$	$\frac{20.0}{(.787)}$	$\frac{22.5}{(.886)}$	$\frac{25.0}{(.984)}$	$\frac{30.0}{(1.181)}$
LB	$\frac{5.0}{(.197)}$	$\frac{5.0}{(.197)}$	$\frac{7.0}{(.276)}$	$\frac{7.0}{(.276)}$	$\frac{7.0}{(.276)}$
F	$\frac{5.0}{(.197)}$	$\frac{7.0}{(.276)}$	$\frac{7.0}{(.276)}$	$\frac{12.0}{(.472)}$	$\frac{12.0}{(.472)}$

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

TOLERANCE:  $\frac{<10}{(<.400)} = \frac{\pm 0.3}{(\pm .012)}$

$\frac{\geq 10}{(\geq .400)} = \frac{\pm 0.5}{(\pm .020)}$

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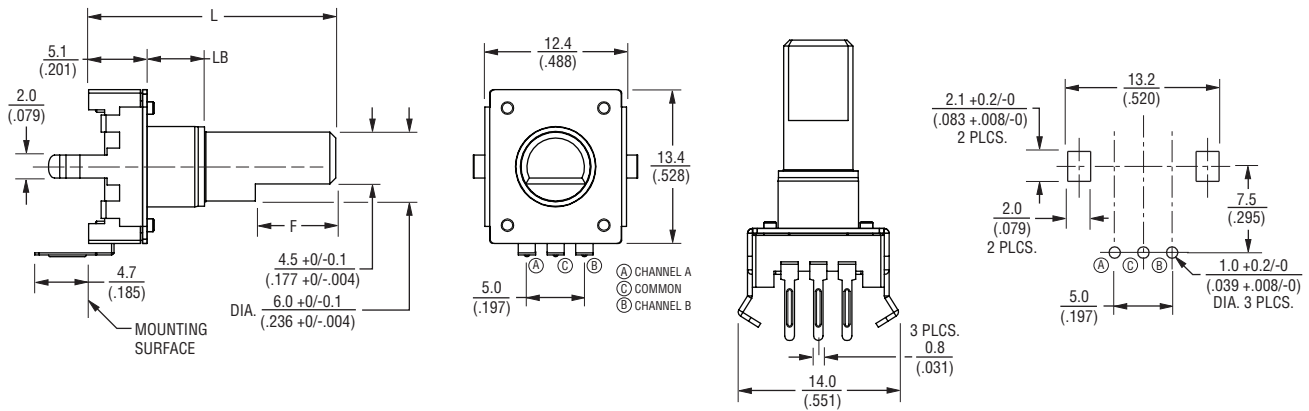
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# PEC12R - 12 mm Incremental Encoder

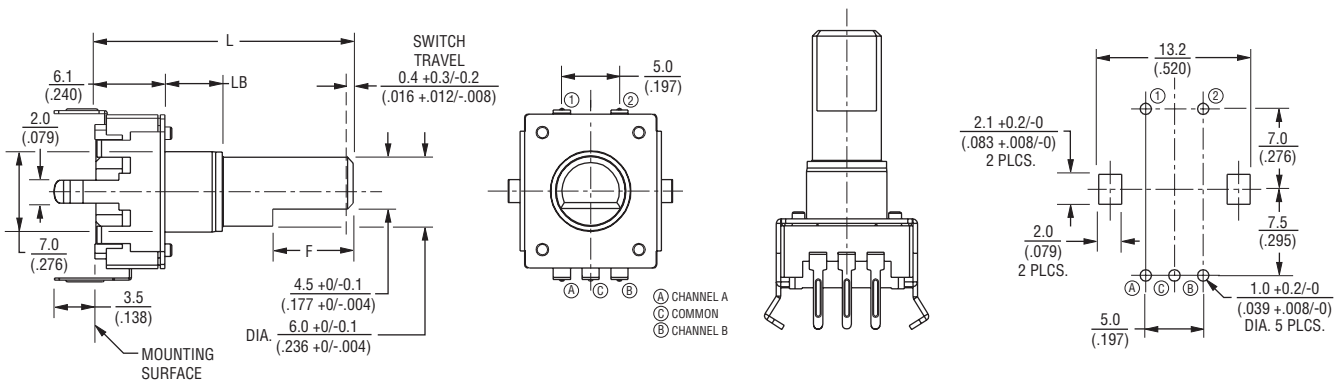
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## Product Dimensions

### 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)



L	15.0 (.591)	17.5 (.688)	20.0 (.787)	22.5 (.886)	25.0 (.984)	30.0 (1.181)
LB	2.0 (.079)	5.0 (.197)	5.0 (.197)	5.0 (.197)	5.0 (.197)	5.0 (.197)
F	5.0 (.197)	5.0 (.197)	7.0 (.276)	7.0 (.276)	12.0 (.472)	12.0 (.472)

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

TOLERANCE:  $\frac{<10}{(<.400)} = \pm 0.3$   
 $\frac{(\pm .012)}$   
 $\frac{\geq 10}{(\ge .400)} = \pm 0.5$   
 $\frac{(\pm .020)}$

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