



Features

- Compact design, long life and high reliability
- Low cost compared to optical type encoders
- Available in a wide variety of configurations to meet many user requirements



PEC16 - 16 mm Incremental Encoder

Electrical Characteristics

Output.....	2-bit quadrature code
Closed Circuit Resistance	3 ohms maximum
Contact Rating	1 mA @ 5 VDC
Insulation Resistance	10 megohms @ 50 VDC
Dielectric Withstanding Voltage	
Sea Level.....	50 VAC minimum
Electrical Travel.....	Continuous
Contact Bounce (15 RPM).....	5.0 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.....	100,000 cycles minimum
Switch Life	20,000 cycles minimum
IP Rating.....	IP 40

Mechanical Characteristics

Mechanical Angle	360 ° continuous
Torque	
Running	30.6 to 204 g-cm (0.42 to 2.83 oz.-in)
Mounting	10.2 kgf. cm (8.83 lb.-in.) maximum
Shaft Side Load (Static).....	3.06 kgf (6.7 lbs.) minimum
Weight	8 gm (0.28 oz.) maximum
Terminals	Printed circuit board terminals
Terminals	Printed circuit board terminals
Soldering Condition	
Wave Soldering	Sn95.5/Ag2.8/Cu0.7 solder with no-clean flux: 260 °C max. for 3-5 seconds
Hand Soldering	Not recommended
Hardware	One flat washer and one mounting nut supplied with each encoder.

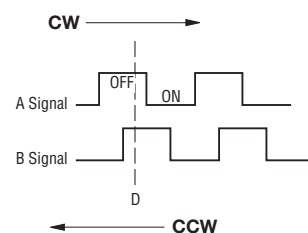
Switch Characteristics

Switch Type	Contact Push ON Momentary SPST
Power Rating (Resistive Load).....	10 mA at 5 V DC
Switch Travel	0.5 +0.4/-0.3 mm
Switch Actuation Force	360 +153/-102 gf (5 +2.1/-1.4 oz.-in.)

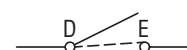
How To Order

Model	PEC16 - 4 0 20 F - S 0012
Terminal Configuration	
2 = PC Pin Vertical/Down Facing	
4 = PC Horizontal/Rear Facing	
Detent Option	
0 = No Detents	
1 = 12 Detents	
2 = 24 Detents	
Standard Shaft Length	
15 = 15 mm	
20 = 20.0 mm	
25 = 25.0 mm ¹	
30 = 30.0 mm ¹	
Shaft Style	
F = Insulated Flatted Shaft	
Switch Configuration	
S = Push Momentary Switch	
N = No Switch	
Resolution	
0012 = 12 Pulses per 360 ° Rotation	
0024 = 24 Pulses per 360 ° Rotation	

Quadrature Output Table



Switch Circuit



¹ Not available with switch

*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.

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:

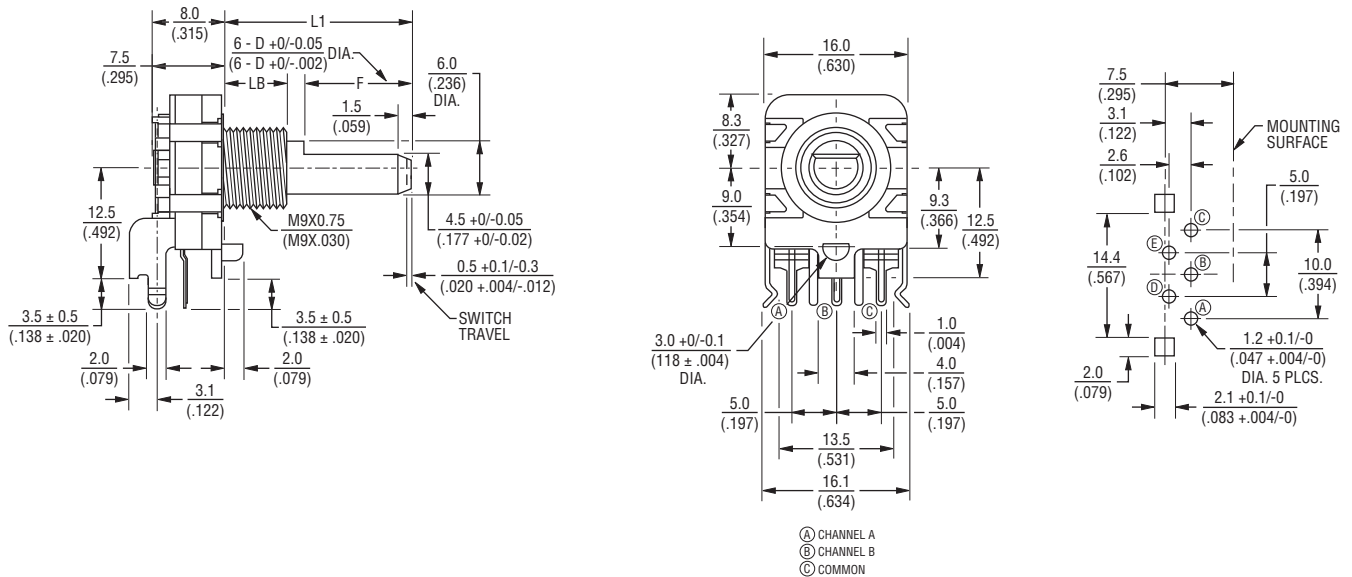
- Audio-visual equipment
- Consumer electric appliances
- Radios
- Musical instrumentation
- Communications equipment

PEC16 - 16 mm Incremental Encoder

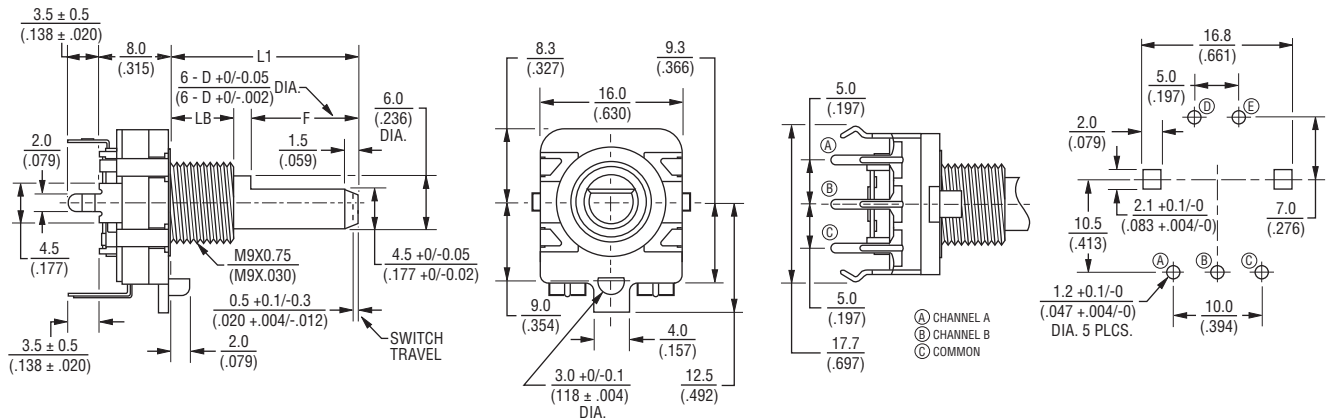
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Product Dimensions

PEC16-2xxxF-Sxxxx



PEC16-4xxxF-Sxxxx



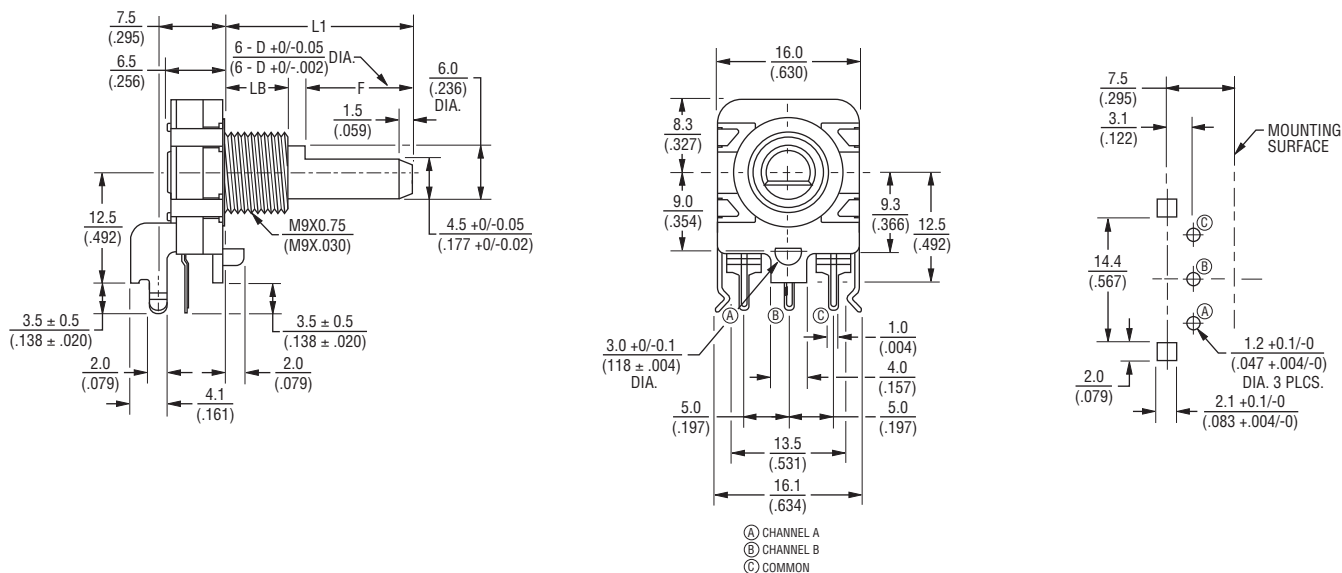
L1	15.0 (.591)	20.0 (.787)
LB	5.0 (.197)	7.0 (.276)
F	7.0 (.276)	12.0 (.472)

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

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.

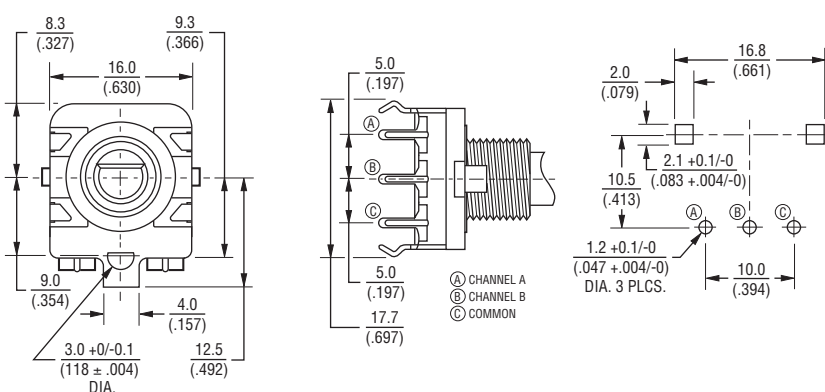
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PEC16-2xxxF-Nxxxx



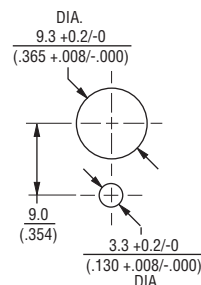
Technical drawing of a screw with the following dimensions and specifications:

- Overall length: $L1$
- Head diameter: $6 - D + 0.005$ ($6 - D + 0.002$) DIA.
- Head length: LB
- Thread length: F
- Thread pitch: $M9X0.75$ ($M9X.030$)
- Thread diameter: 6.0 ($.236$) DIA.
- Thread start diameter: 1.5 ($.059$)
- Thread end diameter: 4.5 ($.177$)
- Thread end diameter tolerance: 4.5 ± 0.005 ($.177 \pm 0.002$)
- Thread end diameter tolerance: 2.7 ($.106$)
- Thread end diameter tolerance: 2.0 ($.079$)
- Thread end diameter tolerance: 3.5 ± 0.5 ($.138 \pm .020$)
- Thread end diameter tolerance: 6.5 ($.256$)
- Thread end diameter tolerance: 3.5 ± 0.5 ($.138 \pm .020$)
- Thread end diameter tolerance: 2.0 ($.079$)
- Thread end diameter tolerance: 4.5 ($.177$)
- Thread end diameter tolerance: 2.7 ($.106$)
- Thread end diameter tolerance: 2.0 ($.079$)
- Thread end diameter tolerance: 3.5 ± 0.5 ($.138 \pm .020$)



L1	$\frac{15.0}{(.591)}$	$\frac{20.0}{(.787)}$	$\frac{25.0}{(.984)}$	$\frac{30.0}{(1.181)}$
LB	$\frac{5.0}{(.197)}$	$\frac{7.0}{(.276)}$	$\frac{7.0}{(.276)}$	$\frac{7.0}{(.276)}$
F	$\frac{7.0}{(.276)}$	$\frac{12.0}{(.472)}$	$\frac{12.0}{(.472)}$	$\frac{12.0}{(.472)}$

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



Users should verify actual device performance in their specific applications.

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