

## Features

- Compact design, long life and high reliability
- Momentary switch
- Triple LED design
- Flatted and knurled shaft styles
- Bushing and bushingless options



# PEL12T - 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

**PEL12T - 4 0 21 F - S 1 024**

Model \_\_\_\_\_

Terminal Configuration \_\_\_\_\_  
 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 |  |
| 18 = 18.5 mm |              |  |
| 21 = 21.0 mm |              |  |
| 26 = 26.0 mm |              |  |
| 31 = 31.0 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 \_\_\_\_\_  
 Triple:  
 1 = Red/Green/Blue

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

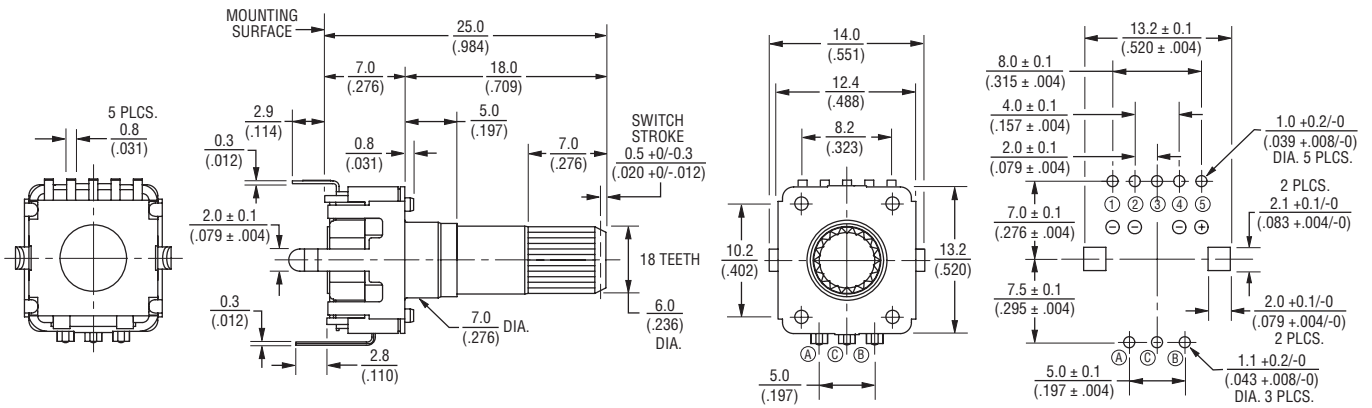
Level control, tuning and timer settings in:

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

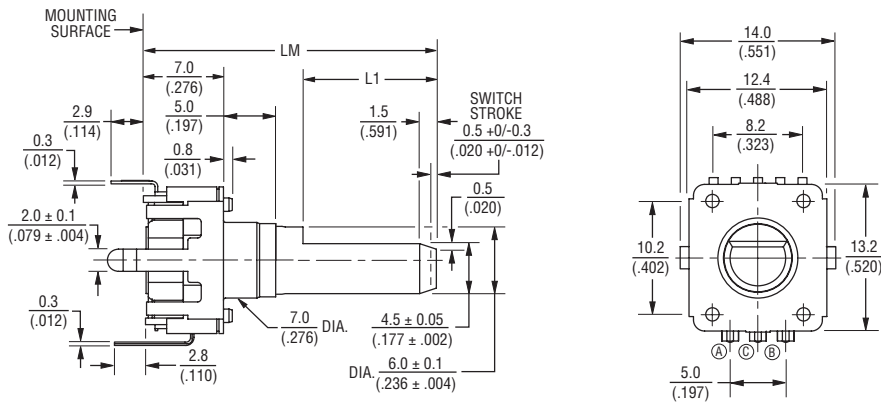
## PEL12T - 12 mm Encoder with Switch and Illuminated Shaft BOURNS®

### Product Dimensions

PEL12T-4xxxS-S1024 (Horizontal Mount w/Triple LED & Switch, Knurled Shaft)



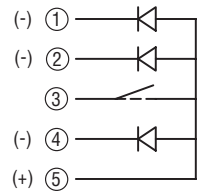
PEL12T-4xxxF-S1024 (Horizontal Mount w/Triple LED & Switch, Flatted Shaft)



| L1                  | LM                    |
|---------------------|-----------------------|
| $\frac{3}{(.118)}$  | $\frac{16}{(.630)}$   |
| $\frac{5}{(.197)}$  | $\frac{18.5}{(.728)}$ |
| $\frac{7}{(.276)}$  | $\frac{21}{(.827)}$   |
| $\frac{12}{(.472)}$ | $\frac{26}{(1.024)}$  |
| $\frac{12}{(.472)}$ | $\frac{31}{(1.220)}$  |

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

### Triple LED Circuit



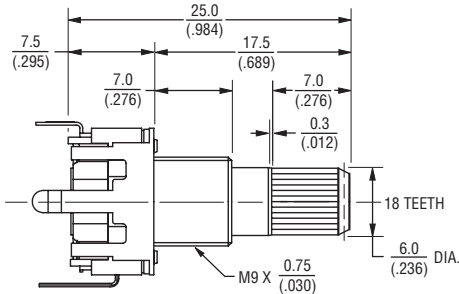
TOLERANCES:  
 UNDER  $\frac{10.0}{(.394)} = \frac{\pm 0.3}{(\pm 0.12)}$      $\frac{10.0 - 100}{(.394 - 3.937)} = \frac{\pm 0.5}{(\pm 0.20)}$

# PEL12T - 12 mm Encoder with Switch and Illuminated Shaft

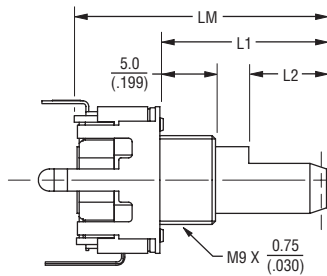


## Product Dimensions

PEL12T-4xxxS-S1024 (Horizontal Mount w/Triple LED & Switch, Knurled Shaft w/Bushing)



PEL12T-4xxxF-S1024 (Horizontal Mount w/Triple LED & Switch, Flatted Shaft w/Bushing)

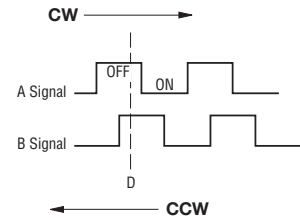


| L2                  | L1                    | LM                    |
|---------------------|-----------------------|-----------------------|
| $\frac{5}{(.197)}$  | $\frac{11}{(.433)}$   | $\frac{18.5}{(.728)}$ |
| $\frac{7}{(.276)}$  | $\frac{13.5}{(.532)}$ | $\frac{21}{(.827)}$   |
| $\frac{12}{(.472)}$ | $\frac{18.5}{(.728)}$ | $\frac{26}{(1.024)}$  |

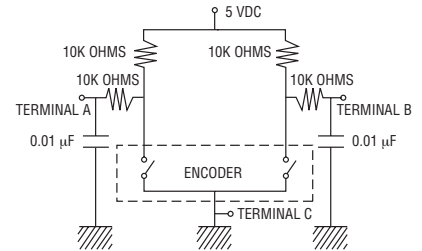
DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

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

## Quadrature Output Table



## Suggested Filter Circuit



## LED Characteristics (Triple)

| LED Color      | Power Dissipation (mW) | DC Forward Current (mA) | Forward Voltage (V) |      |
|----------------|------------------------|-------------------------|---------------------|------|
|                |                        |                         | Typ.                | Max. |
| Red/Green/Blue | Red                    | 25                      | 2.0                 | 2.4  |
|                | Green                  | 25                      | 3.3                 | 3.7  |
|                | Blue                   | 25                      | 3.3                 | 3.7  |

Notes:

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

## LED Terminal Decoder

| Code | Color              | Terminals       |
|------|--------------------|-----------------|
| 1    | Red / Green / Blue | ① ⑤ / ② ⑤ / ④ ⑤ |



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

## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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