

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

Contact Push ON Momentary SPS	Electrical Characteristics	
Joseph J	Output	
100 megohms @ 250 VD Delectric Withstanding Voltage 300 VAC minimum 300 VAC		
100 megohms @ 250 VD Delectric Withstanding Voltage 300 VAC minimum 300 VAC	Contact Rating	0.5 mA @ 5 VD0
Sea Level	nsulation Resistance	
Identical Travel	Dielectric Withstanding Voltage	· ·
20 ms. maximum'	Sea Level	
PM (Operating)	ectrical Travel	
Environmental Characteristics	Contact Bounce (15 RPM)	2.0 ms. maximum*
Derating Temperature Range	RPM (Operating)`	
Storage Temperature Range		
Derating Humidity 25 % to 85 % R.H. 30,000 cycles minimum Notational Life 30,000 cycles minimum Pating 20,000 cycles m	Operating Temperature Range	10 °C to +70 °C (+14 °F to +158 °F
Mechanical Characteristics	Storage Temperature Range	40 °C to +85 °C (-40 °F to +185 °F
Mechanical Characteristics 360 continuou 19 4	Operating Humidity	
P Alting	Rotational Life	
Mechanical Characteristics		
Mechanical Angle	P Rating	IP 40
Select Torque 30 to 200 g-cm (0.42 to 2.77 oz -in.) maximum that Strength (Push) 50 g-cm (0.69 oz -in.) maximum that Strength (Push) 5 kgf (1.10 lbs.) 5 kgf (1.10 lbs.) 5 kgf (1.10 lbs.) 6 kgf (2.20 lbs.) 7 kgf		
Sunning Torque		
Shaft Strength (Push)	•	• (
## Shaft Strength (Pull)		
Veight	Shaft Strength (Push)	5 kgf (11.0 lbs
reminals Printed circuit board terminal Soldering Condition Wave Soldering. Sn95.5/Ag2.8/Cu0.7 solder with no-clean flux: 260 °C max. for 5 ± 1 second Hand Soldering. Not recommende Hardware. One flat washer and one mounting nut supplied with each encoder with bushin Switch Characteristics Switch Characteristics Switch Type Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentary SPS' Ower Rating (Resistive Load). 10 mA at 5 V DO Contact Push ON Momentar		
Soldering Condition Wave Soldering		
Wave Soldering Sn95.5/Ag2.8/Cu0.7 solder with no-clean flux: 260 °C max. for 5 ± 1 second Hand Soldering Not recommended and wave One flat washer and one mounting nut supplied with each encoder with bushing Switch Characteristics Switch Characteristics Switch Type Contact Push ON Momentary SPS' Power Rating (Resistive Load) 10 mA at 5 V D0 contact Resistance 100 millions witch Travel 10.5 ± 0.0 for 3 millions witch Travel 10.5 ± 0.0 for 3 millions witch Travel 10.5 ± 0.0 for 3 millions witch Actuation Force 450 gt (15.9 ± 7.0 oz.) How To Order PEL12D - 4 0 21 F - S 1 02 Model Perminal 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 25 = 25.0 mm 18 = 18.5 mm 31 = 31.0 mm 21 = 21.0 mm Shaft Style F = Insulated Flatted Shaft Style Sex Push Momentary Switch Sex Push		Printed circuit board terminal:
Hand Soldering	Soldering Condition	
Ardware	Wave Soldering	
Switch Characteristics Switch Type		
Switch Type	Hardware	One flat washer and one mounting nut supplied with each encoder with bushing
20 ma at 5 V DC	Switch Characteristics	
Contact Resistance	Switch Type	
Switch Travel	Power Rating (Resistive Load)	10 mA at 5 V DC
How To Order PEL12D - 4 0 21 F - S 1 02	Contact Resistance	
How To Order PEL12D - 4 0 21 F - S 1 02	Switch Travel	
Model Terminal Configuration —	Switch Actuation Force	450 ± 200 gf (15.9 ±7.0 oz.
Model Terminal Configuration —	How To Order	
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: 16 = 16.0 mm 26 = 26.0 mm 25 = 25.0 mm 18 = 18.5 mm 31 = 31.0 mm 21 = 21.0 mm Shaft Style F = Insulated Flatted Shaft		PEL12D - 4 0 21 F - S 1 02
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: 16 = 16.0 mm 26 = 26.0 mm 25 = 25.0 mm 18 = 18.5 mm 31 = 31.0 mm 21 = 21.0 mm Shaft Style F = Insulated Flatted Shaft Syle G = Insulated Flatted Shaft w/Bushing*** S = 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		
Detent Option 0 = No Detents		4 - Horizontal Mount/Rear Evit PC Pin
0 = No Detents 2 = 24 Detents Standard Shaft Length Flatted: 16 = 16.0 mm 26 = 26.0 mm 25 = 25.0 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*** S = 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		T = 10120/flat Modify 164 Ext 1 0 1 m
Flatted: Knurled: 16 = 16.0 mm 26 = 26.0 mm 25 = 25.0 mm 18 = 18.5 mm 31 = 31.0 mm 21 = 21.0 mm Shaft Style		
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18 = 18.5 mm 31 = 31.0 mm 21 = 21.0 mm Shaft Style F = Insulated Flatted Shaft 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	Flatted:	Manual and
21 = 21.0 mm Shaft Style		
Shaft Style F = Insulated Flatted Shaft G = Insulated Flatted Shaft w/Bushing*** S = Insulated Knurled Shaft (18 Teeth) S = Push Momentary Switch LED Color Dual: 1 = Blue/Orange 2 = Green/Red 3 = Blue/Green	16 = 16.0 mm 26 = 26.0 mm	
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	16 = 16.0 mm 26 = 26.0 mm 18 = 18.5 mm 31 = 31.0 mm	
G = Insulated Flatted Shaft w/Bushing*** T = Insulated Knurled Shaft (18 Teeth) w/Bushing Switch Configuration S = Push Momentary Switch ED Color Dual: 1 = Blue/Orange 2 = Green/Red 3 = Blue/Green	16 = 16.0 mm 26 = 26.0 mm 18 = 18.5 mm 31 = 31.0 mm 21 = 21.0 mm	
Switch Configuration S = Push Momentary Switch LED Color Dual: 1 = Blue/Orange 2 = Green/Red 3 = Blue/Green	16 = 16.0 mm 26 = 26.0 mm 18 = 18.5 mm 31 = 31.0 mm 21 = 21.0 mm Shaft Style	25 = 25.0 mm
S = Push Momentary Switch LED Color	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	25 = 25.0 mm S = Insulated Knurled Shaft (18 Teeth)
ED Color Dual: 1 = Blue/Orange 2 = Green/Red 3 = Blue/Green	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 G = Insulated Flatted Shaft w/Bushing***	25 = 25.0 mm S = Insulated Knurled Shaft (18 Teeth)
Dual: 1 = Blue/Orange 2 = Green/Red 3 = Blue/Green	16 = 16.0 mm	25 = 25.0 mm S = Insulated Knurled Shaft (18 Teeth)
1 = Blue/Orange 2 = Green/Red 3 = Blue/Green	16 = 16.0 mm	25 = 25.0 mm S = Insulated Knurled Shaft (18 Teeth)
2 = Green/Red 3 = Blue/Green	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 G = Insulated Flatted Shaft w/Bushing*** Switch Configuration S = Push Momentary Switch LED Color	25 = 25.0 mm S = Insulated Knurled Shaft (18 Teeth)
	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 G = Insulated Flatted Shaft w/Bushing*** Switch Configuration S = Push Momentary Switch LED Color Dual:	25 = 25.0 mm S = Insulated Knurled Shaft (18 Teeth)
Resolution	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 G = Insulated Flatted Shaft w/Bushing*** Switch Configuration S = Push Momentary Switch LED Color Dual: 1 = Blue/Orange 2 = Green/Red	25 = 25.0 mm S = Insulated Knurled Shaft (18 Teeth)
	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 G = Insulated Flatted Shaft w/Bushing*** Switch Configuration S = Push Momentary Switch LED Color Dual: 1 = Blue/Orange 2 = Green/Red	25 = 25.0 mm S = Insulated Knurled Shaft (18 Teeth)
*** A	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 G = Insulated Flatted Shaft w/Bushing*** Switch Configuration S = Push Momentary Switch ED Color Dual: 1 = Blue/Orange 2 = Green/Red 3 = Blue/Green	25 = 25.0 mm S = Insulated Knurled Shaft (18 Teeth)

^{***} 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.

Applications

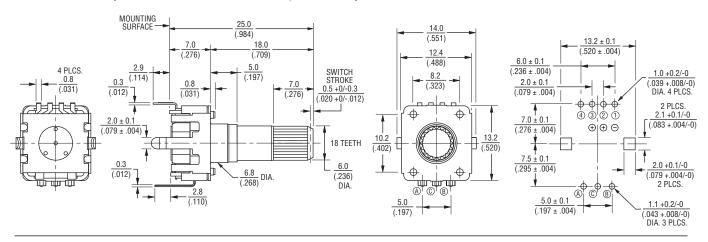
Level control, tuning and timer settings in:

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

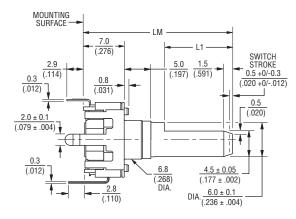
PEL12D - 12 mm Encoder with Switch and Illuminated Shaft **FOURNS**

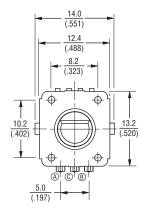
Product Dimensions

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



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



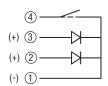


L1	LM
3	16
(.118)	(.630)
<u>5</u>	18.5
(.197)	(.728)
7	21
(.276)	(.827)
12	26
(.472)	(1.024)
12	31
(.472)	(1.220)

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

Dual LED Circuit

 $\label{eq:UNDER} \begin{array}{c} \text{TOLERANCES:} \\ \text{UNDER} \, \frac{10.0}{(.394)} = \frac{\pm 0.3}{(\pm .012)} & \frac{10.0 \sim 100}{(.394 \sim 3.937)} = \frac{\pm 0.5}{(\pm .020)} \end{array}$

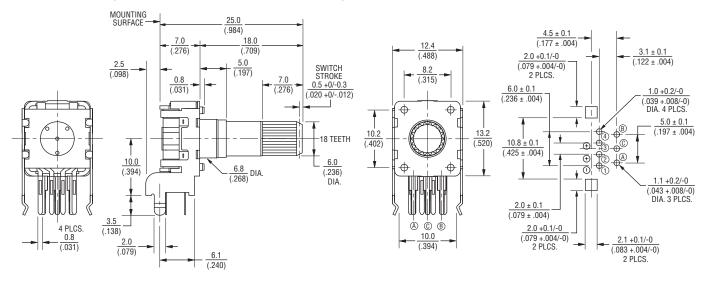


PEL12D - 12 mm Encoder with Switch and Illuminated Shaft

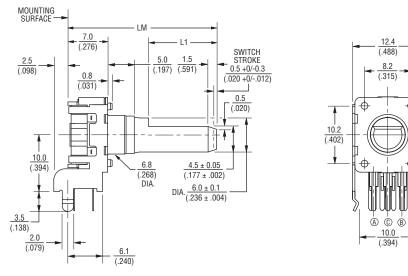
BOURNS

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	16
(.118)	(.630)
<u>5</u>	18.5
(.197)	(.728)
7	21
(.276)	(.827)
12	26
(.472)	(1.024)
12	31
(.472)	(1.220)

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

Ф

ф

(.520)

 $\begin{aligned} & & \text{TOLERANCES:} \\ & \text{UNDER} \frac{10.0}{(.394)} = \frac{\pm 0.3}{(\pm .012)} & \frac{10.0 \sim 100}{(.394 \sim 3.937)} = \frac{\pm 0.5}{(\pm .020)} \end{aligned}$

PEL12D - 12 mm Encoder with Switch and Illuminated Shaft

L2

(.197)

(.276)

12

(.472)

L1

11

(.433)

13.5

(.532)

18.5

(.728)

LM

18.5

(.728)

(.827)

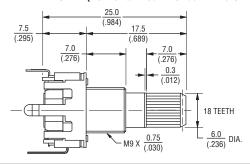
26

(1.024)

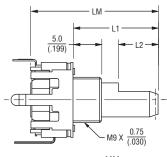
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Product Dimensions

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



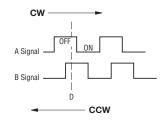
PEL12D-4xxxG-Sxxxx (Horizontal Mount w/Dual LED & Switch, Flatted Shaft w/Bushing)



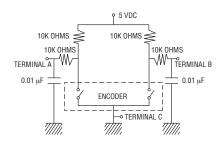
).) ^{A 6101}
DIMENSIONS:	MM
DIIVIENSIONS.	(INCHES)

 $\begin{aligned} & & & \text{TOLERANCES:} \\ & \text{UNDER} \, \frac{10.0}{(.394)} = \frac{\pm 0.3}{(\pm .012)} \quad \frac{10.0 \sim 100}{(.394 \sim 3.937)} = \frac{\pm 0.5}{(\pm .020)} \end{aligned}$

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)

		_	DC	Forward Voltage (V)	
LED Color		Power Dissipation (mW)	Forward Current (mA)	Тур.	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:

 $\begin{array}{lll} \mbox{Reverse Current:} & 10 \ \mu\mbox{A} \\ \mbox{Reverse Voltage:} & 5 \ \mbox{VDC} \\ \mbox{Test Condition (IF):} & 20 \ \mbox{mA} \end{array}$

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