



# Series 11CE

## 12mm Rotary Encoder

- Compact 12 mm package size
- Rotational life (30,000 cycles)
- Wide temperature range (-10°C to +70°C)
- Momentary switch option
- Bushing and mounting style options

### Applications

- Consumer portable electronics
- Commercial appliances
- Instrument amplifiers and guitar effects
- Keyboards and synthesizers
- Communications equipment



### Ordering Information

Series	Terminal Configuration	Shaft Length	Shaft Trim	Resolution	Detent Option	Switch Option
11CE	H	20	F	12	2	A

Code	Spec.
M	Horizontal/Side Mount Sleeve Bushing, PC Pins, 10mm Height
H	Vertical/Rear Mount Thread Bushing, PC Pins
K	Vertical/Rear Mount Sleeve Bushing, PC Pins
Y	Horizontal/Side Mount Thread Bushing, PC Pins, 10mm Height

Code	Spec.
F	Flatted

Code	Spec.
12	12 PPR
24	24 PPR

Code	Spec.
A	No switch
B	Momentary switch

Code	Spec.*
17	17.5 mm
20	20 mm
25	25 mm
30	30 mm

Code	Spec.
1	No Detents
2	12 Detents*
3	24 Detents**

\*Available w/12 PPR only  
\*\*Available w/12 & 24 PPR

\* See outline drawings for shaft length (LM) availability by configuration.



## Encoder Specifications

		Min	Typical	Max	Unit
Voltage Rating	@ 0.5 mA	–	+5.0	–	VDC
Output	2-bit quadrature				
Insulation Resistance	100 MΩ min. @ 250 VDC				
Dielectric Strength	300 VAC for 1 min., no arcing				
Resolution	12 or 24 PPR (pulses per revolution)				
Contact Bounce/Chatter	(See Fig. 1)				
t1, t3	≤ 3 ms				
t2	≤ 2 ms				
Phase Difference	(See Fig. 2)				
12 PPR	ΔT ≥ 4 ms (A leads B by 90° in the CW direction)				
24 PPR	ΔT ≥ 3.5 ms (A leads B by 90° in the CW direction)				
Total Mechanical Travel	360° continuous				
Operating Torque	50 gf-cm (non-detent option only)				
Detent Position					
12 detents	30° ± 3°				
24 detents	15° ± 3°				
Detent Torque	30 to 200 gf-cm				
Detent Position Play	4° max.				
Shaft Wobble	1.0 x L/30mm p-p max.; L = Shaft Length				
Shaft Push-Pull Strength	5 kgf for 10 sec.				
Shaft Static Side Load	2 kgf max.				
Terminal Strength	300 gf max.				
Rotational Life	30,000 cycles				

## Switch Specifications

		Min	Typical	Max	Unit
Voltage Rating	@ 0.5 mA	–	+5.0	–	VDC
Contact Resistance	100 mΩ max.				
Contact Arrangement	SPST Momentary				
Chatter	10 ms max.				
Switch Travel	0.5mm +0.4mm, -0.3mm				
Actuation Force	300 gf +150 gf/-100 gf				
Insulation Resistance	100 MΩ min. @ 250 VDC				
Dielectric Strength	300 VAC for 1 min., no arcing				
Operating Life	20,000 actuations				
IP Rating	40				
Packaging	Tray				
Weight	3.2 grams				

## Environmental Specifications

	Min	Typical	Max	Unit
Operating Temperature	-10	–	+70	°C
Storage Temperature	-40	–	+85	°C
Soldering Conditions				
Wave Solder	Preheat: 100°C max for 2 min max; Solder temperature: 260°C ± 5°C for 5 sec max.; No clean foam flux recommended			
Manual Solder	350°C ± 5°C for 3 sec max.; Sn95Ag5 no clean solder			
Wash	Not recommended			
Moisture Sensitivity Level	1			
ESD Classification (HBM)	Not applicable			

All testing is performed at room ambient conditions except as noted. Users should verify device actual performance in their specific applications  
 This product is compliant to RoHS3 Directive 2015/863 Amendments of Annex II on 31 March 2015, and REACH SVHC Directive EC 1907/2006 Amendments of Annex XIV & Annex XVII on 15 January 2018.  
 Custom and value-added options available on request. Please contact your sales representative for additional information.

## Electrical Specifications

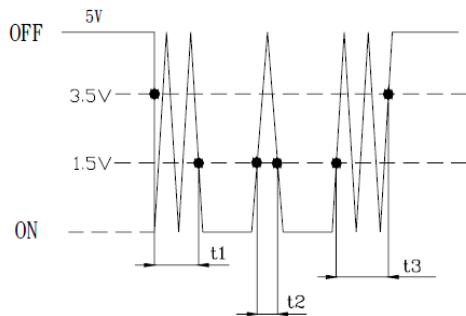


Figure 1: Contact Bounce/Chatter

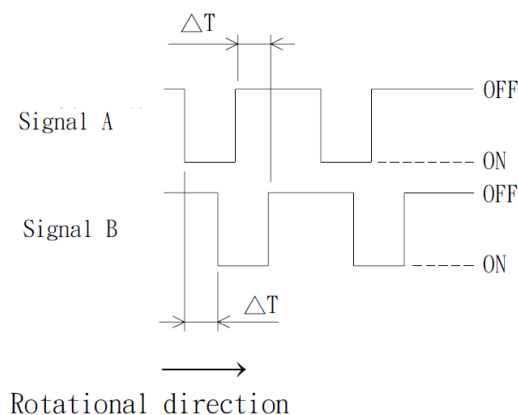


Figure 2: Phase Difference

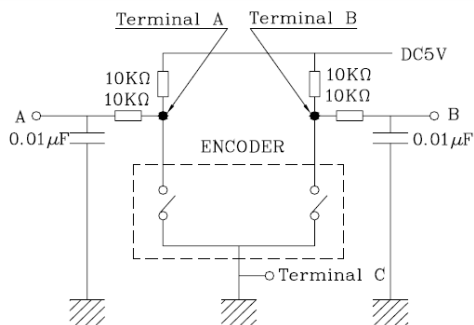
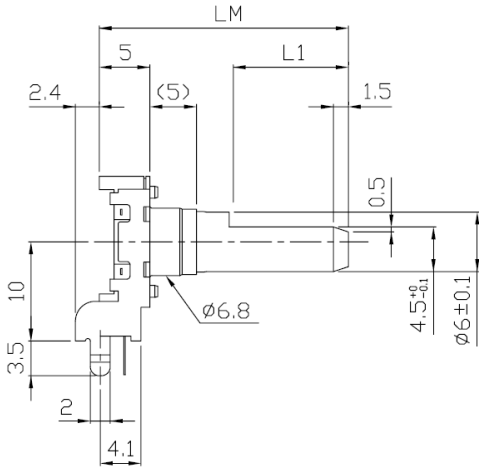


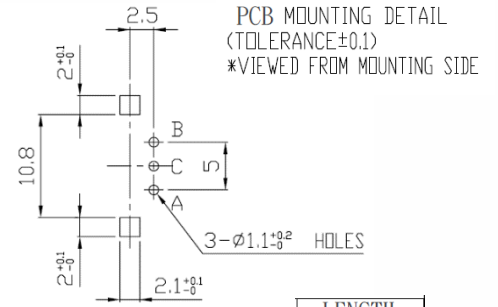
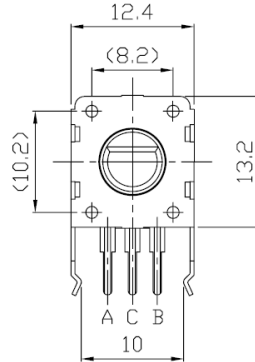
Figure 3: Suggested Filter Circuit

### Mechanical Specifications

#### Series 11CE Horizontal/Side Mount Sleeve Bushing (No Switch)

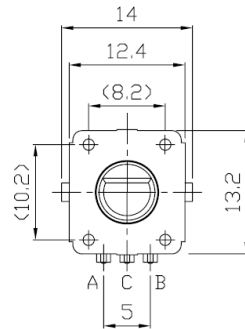
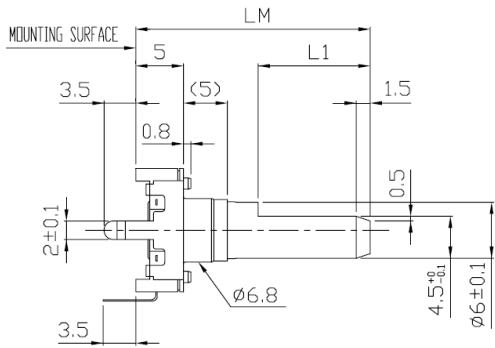


SHAFT FLAT HAS RANDOM ORIENTATION

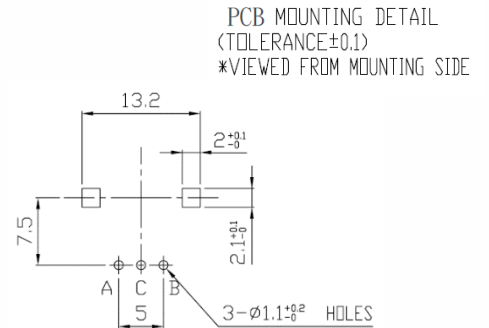


LENGTH	
L1	LM
5	17.5
7	20
12	25
12	30

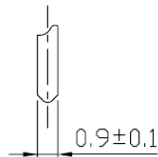
#### Series 11CE Vertical/Rear Mount Sleeve Bushing (No Switch)



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Unit: mm



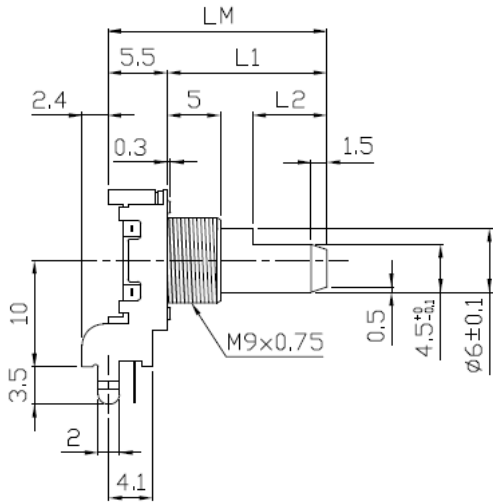
TERMINAL DETAIL

TOLERANCES UNLESS OTHERWISE SPEC	
$L \leq 10$	$\pm 0.3$
$10 < L \leq 100$	$\pm 0.5$
$100 < L$	$\pm 0.8$
ANGULAR DIMENSION	$\pm 5^\circ$

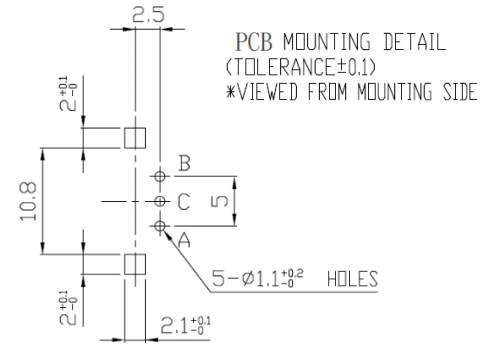
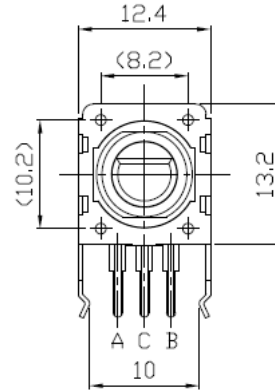
LENGTH	
L1	LM
5	17.5
7	20
12	25
12	30

### Mechanical Specifications

#### Series 11CE Horizontal/Side Mount with Threaded Bushing (No Switch)

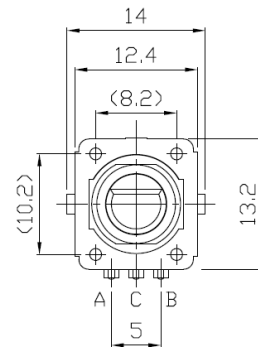
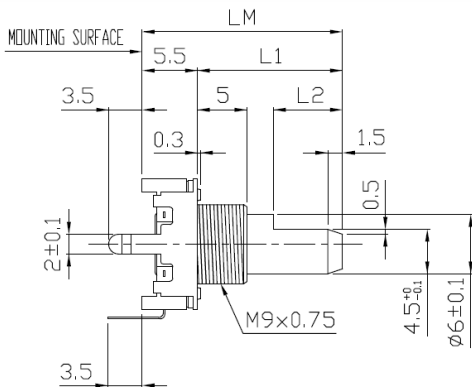


SHAFT FLAT HAS RANDOM ORIENTATION

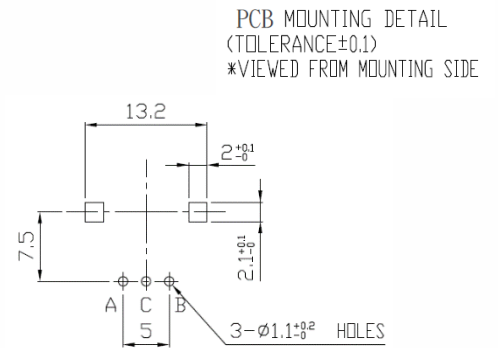


LENGTH		
L2	L1	LM
5	12	17.5
7	14.5	20
12	19.5	25
12	24.5	30

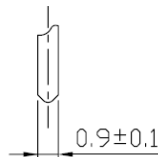
#### Series 11CE Vertical/Rear Mount with Threaded Bushing (No Switch)



SHAFT FLAT HAS RANDOM ORIENTATION



Unit: mm



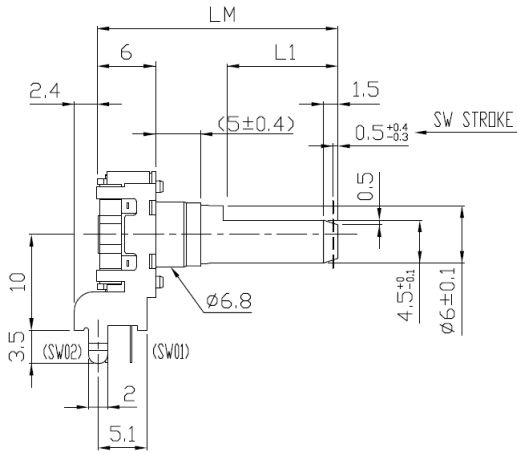
TERMINAL DETAIL

TOLERANCES UNLESS OTHERWISE SPEC	
L ≤ 10	±0.3
10 < L ≤ 100	±0.5
100 < L	±0.8
ANGULAR DIMENSION	±5°

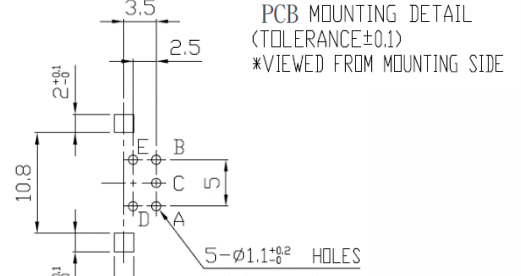
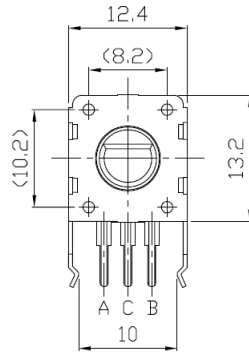
LENGTH		
L2	L1	LM
5	12	17.5
7	14.5	20
12	19.5	25
12	24.5	30

### Mechanical Specifications

#### Series 11CE Horizontal/Side Mount Sleeve Bushing (With Switch)



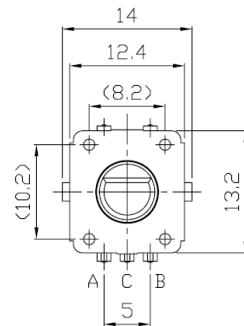
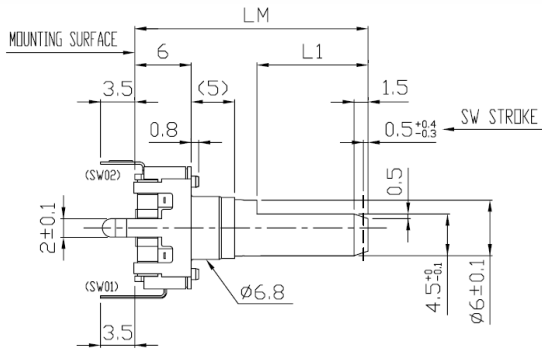
SHAFT FLAT HAS RANDOM ORIENTATION



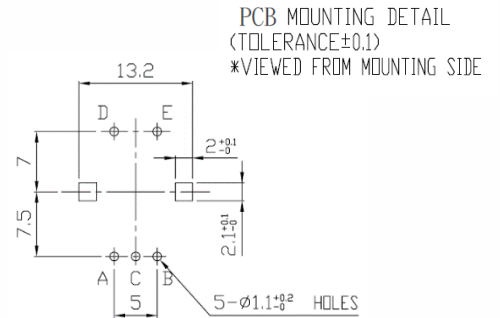
PCB MOUNTING DETAIL  
(TOLERANCE±0.1)  
\*VIEWED FROM MOUNTING SIDE

LENGTH	
L1	LM
5	17.5
7	20
12	25
12	30

#### Series 11CE Vertical/Rear Mount Sleeve Bushing (With Switch)

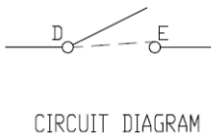
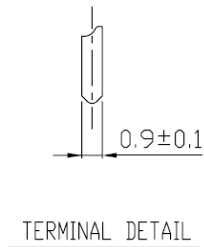


SHAFT FLAT HAS RANDOM ORIENTATION



PCB MOUNTING DETAIL  
(TOLERANCE±0.1)  
\*VIEWED FROM MOUNTING SIDE

Unit: mm

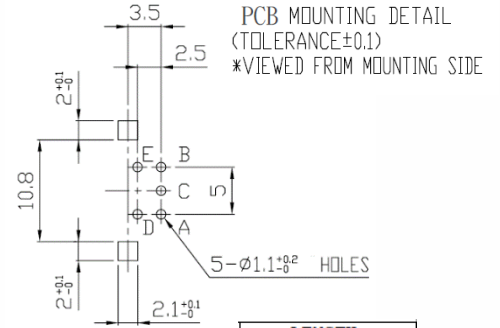
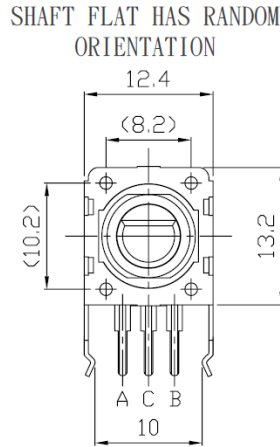
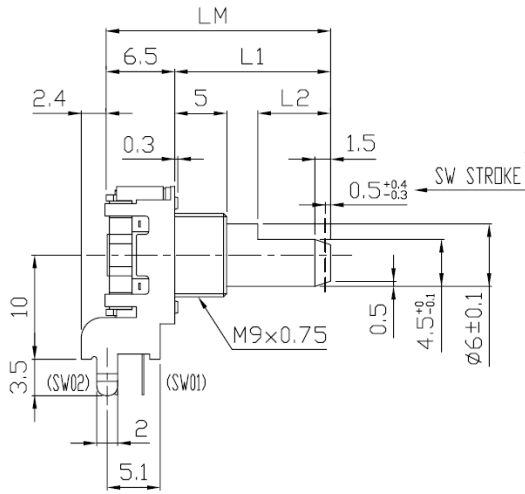


TOLERANCES UNLESS OTHERWISE SPEC	
$L \leq 10$	±0.3
$10 < L \leq 100$	±0.5
$100 < L$	±0.8
ANGULAR DIMENSION	±5°

LENGTH	
L1	LM
5	17.5
7	20
12	25
12	30

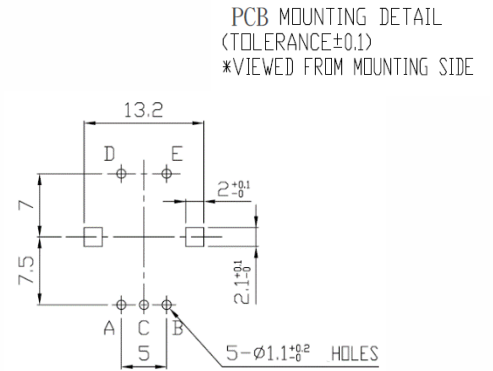
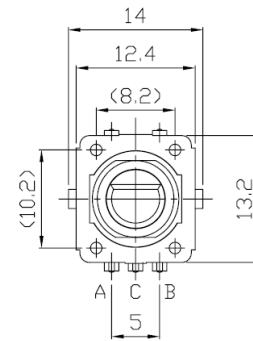
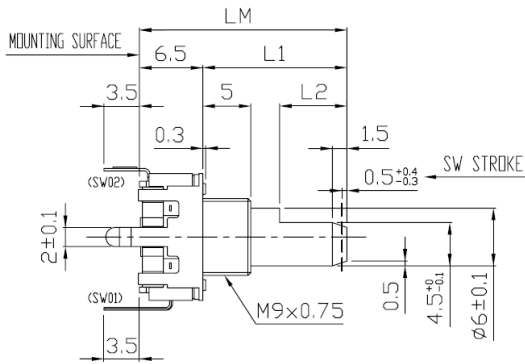
### Mechanical Specifications

#### Series 11CE Horizontal/Side Mount with Threaded Bushing (With Switch)



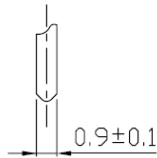
LENGTH		
L2	L1	LM
5	12	17.5
7	14.5	20
12	19.5	25
12	24.5	30

#### Series 11CE Vertical/Rear Mount with Threaded Bushing (With Switch)



SHAFT FLAT HAS RANDOM ORIENTATION

Unit: mm



TERMINAL DETAIL



CIRCUIT DIAGRAM

TOLERANCES UNLESS OTHERWISE SPEC	
L ≤ 10	±0.3
10 < L ≤ 100	±0.5
100 < L	±0.8
ANGULAR DIMENSION	±5°

LENGTH		
L2	L1	LM
5	12	17.5
7	14.5	20
12	19.5	25
12	24.5	30

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