



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

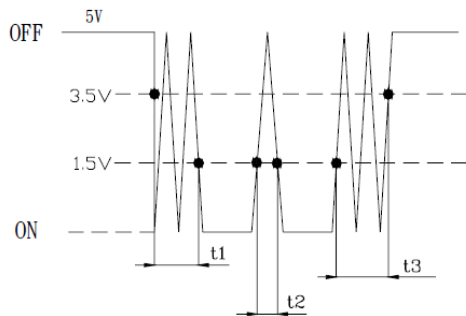


Figure 1: Contact Bounce/Chatter

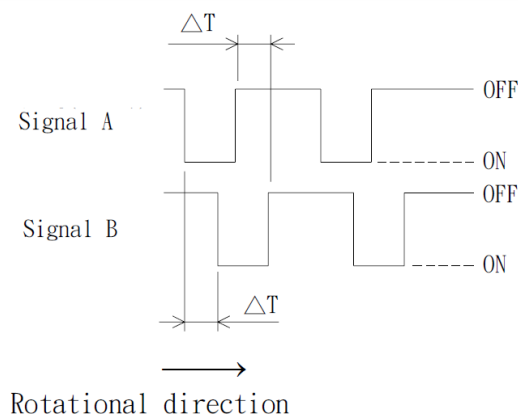


Figure 2: Phase Difference

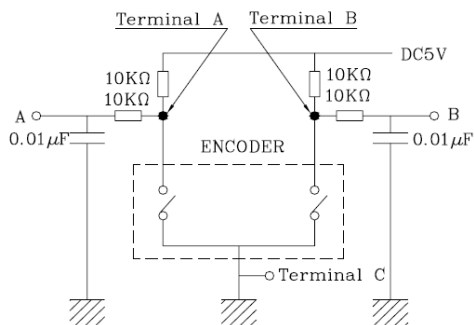
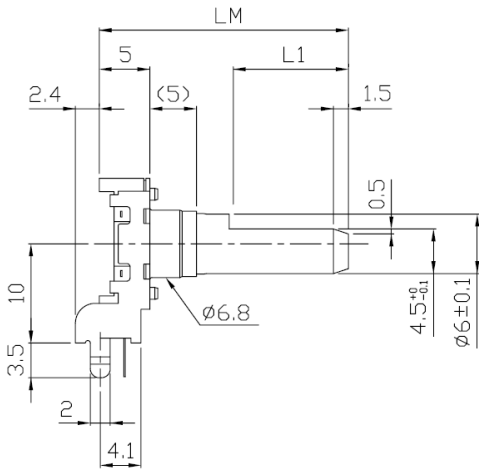


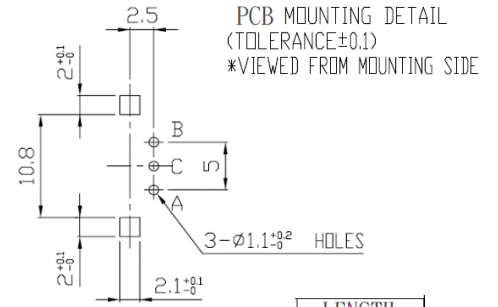
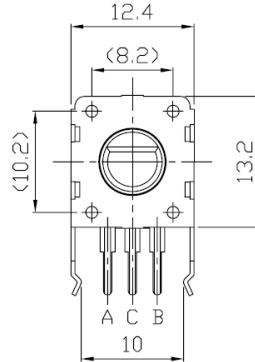
Figure 3: Suggested Filter Circuit

Mechanical Specifications

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

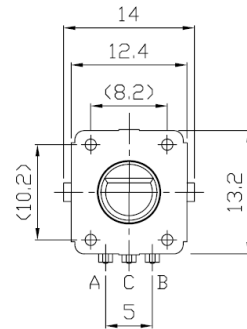
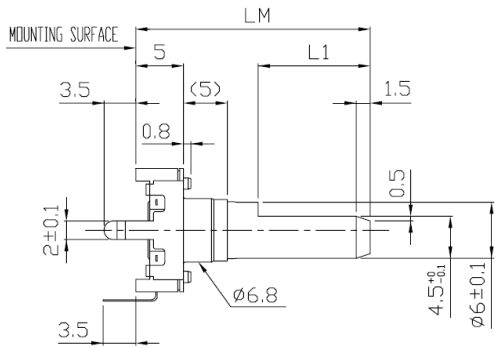


SHAFT FLAT HAS RANDOM ORIENTATION

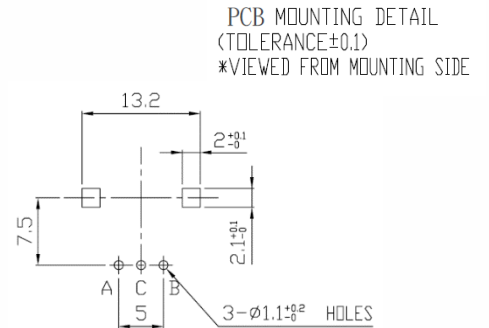


| LENGTH | |
|--------|------|
| L1 | LM |
| 5 | 17.5 |
| 7 | 20 |
| 12 | 25 |
| 12 | 30 |

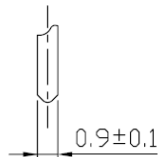
Series 11CE Vertical/Rear Mount Sleeve Bushing (No Switch)



SHAFT FLAT HAS RANDOM ORIENTATION



Unit: mm



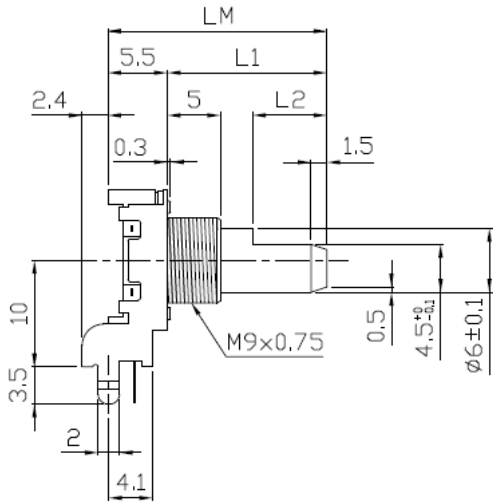
TERMINAL DETAIL

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

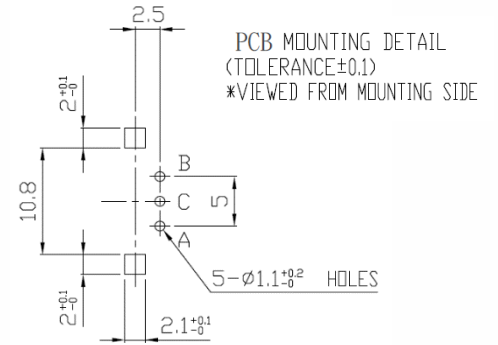
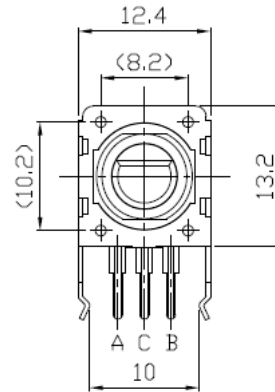
| LENGTH | |
|--------|------|
| L1 | LM |
| 5 | 17.5 |
| 7 | 20 |
| 12 | 25 |
| 12 | 30 |

Mechanical Specifications

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

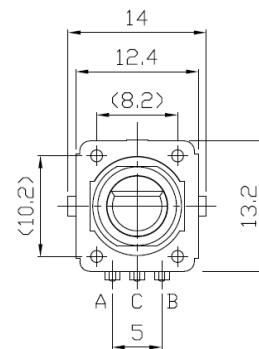
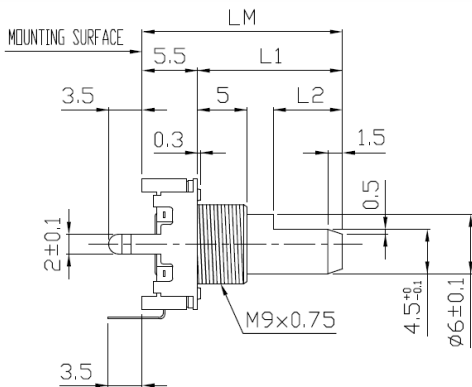


SHAFT FLAT HAS RANDOM ORIENTATION

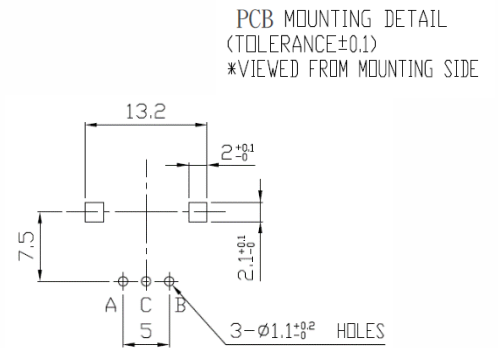


| LENGTH | | |
|--------|------|------|
| L2 | L1 | LM |
| 5 | 12 | 17.5 |
| 7 | 14.5 | 20 |
| 12 | 19.5 | 25 |
| 12 | 24.5 | 30 |

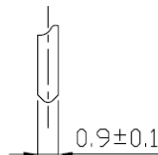
Series 11CE Vertical/Rear Mount with Threaded Bushing (No Switch)



SHAFT FLAT HAS RANDOM ORIENTATION



Unit: mm



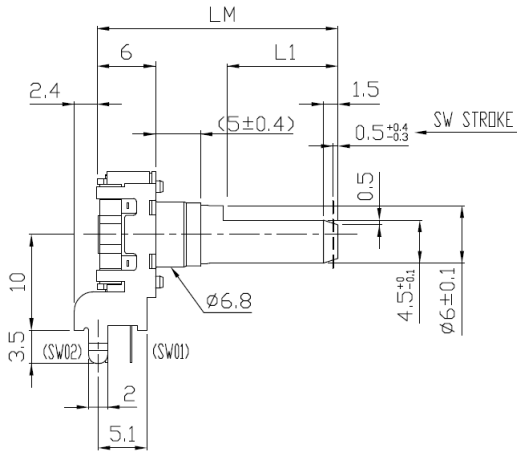
TERMINAL DETAIL

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

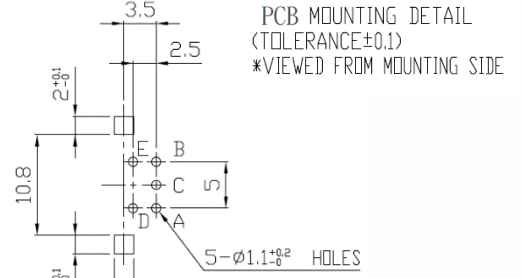
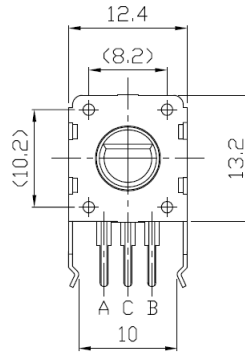
| LENGTH | | |
|--------|------|------|
| L2 | L1 | LM |
| 5 | 12 | 17.5 |
| 7 | 14.5 | 20 |
| 12 | 19.5 | 25 |
| 12 | 24.5 | 30 |

Mechanical Specifications

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



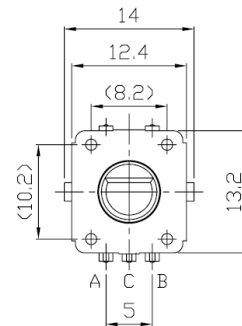
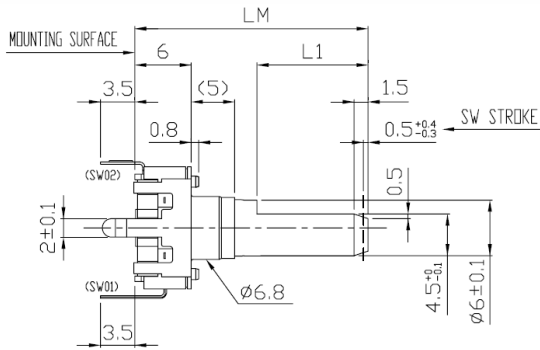
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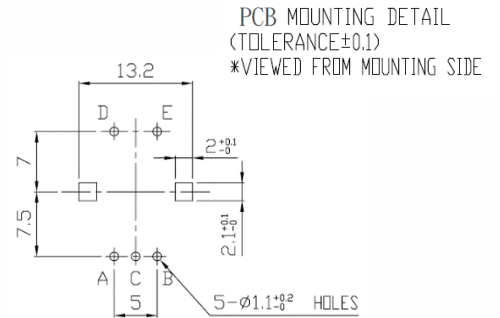
PCB MOUNTING DETAIL
(TOLERANCE±0.1)
*VIEWED FROM MOUNTING SIDE

| LENGTH | |
|--------|------|
| L1 | LM |
| 5 | 17.5 |
| 7 | 20 |
| 12 | 25 |
| 12 | 30 |

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

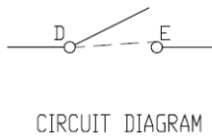
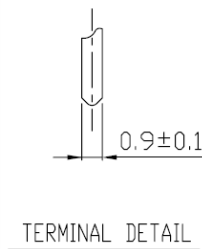


SHAFT FLAT HAS RANDOM ORIENTATION



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

Unit: mm



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

| LENGTH | |
|--------|------|
| L1 | LM |
| 5 | 17.5 |
| 7 | 20 |
| 12 | 25 |
| 12 | 30 |