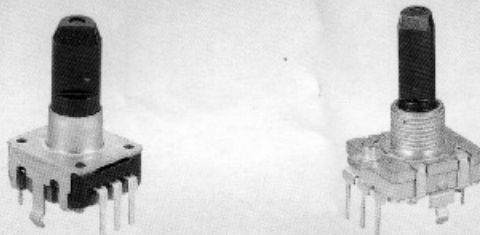


INSULATED SHAFT ENCODERS



■ Features

- High-precision sliding type encoder.
- Compact design, long life and high reliability.
- Low cost as compared with optical type.
- Available in a wide variety of lineup to meet all user needs.

■ Applications

- All kinds of level control, tuning and timer setting in audio-visual equipment, ordinary household electric appliances, radio equipment, communications equipment, etc.

■ Products Line

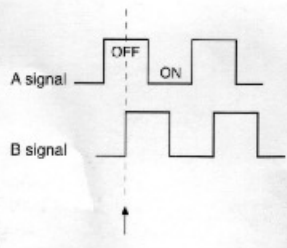
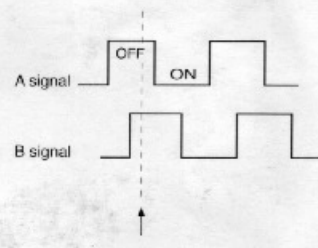
Size	Model	pulses /rotation		Output signal	Rotational angle	Rotational life(cycles)	Mounting method	Other
		With detent	With out detent					
12 mm	ED 12	12	12	phase difference in output of 2 signals. A and B	360° (Endless)	30,000	With collar /snap-in	Insulated shaft With push-on switch
		24	24					
16 mm	ED 16	12	12	phase difference in output of 2 signals. A and B	360° (Endless)	100,000	Fastened with bushing unit /snap-in	Insulated shaft With push-on switch
		24	24					

INSULATED SHAFT ENCODERS

■ Mechanical characteristics

Item	ED 12	ED 16
Total rotational angle	360°	360°
Rotational torque	3 ~ 20 mN.m 30 ~ 200gf.cm	3 ~ 24 mN.m 30 ~ 240gf.cm
Shaft push-pull strength	50N / 5.1kgf max.	

■ Electrical characteristics


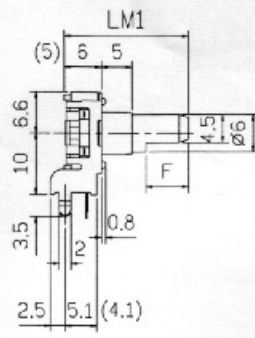
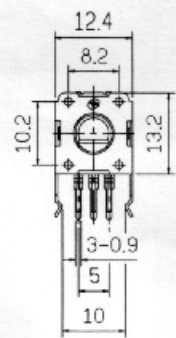
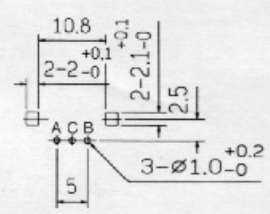
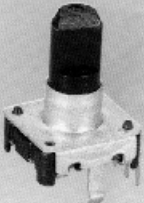
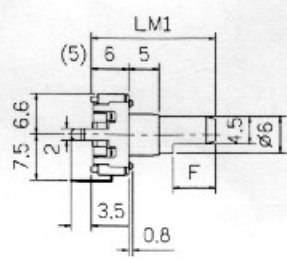
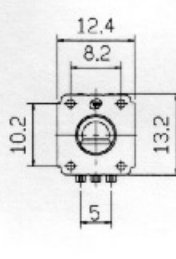
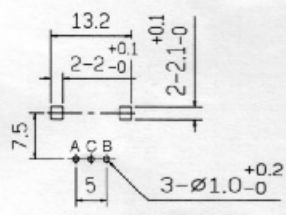
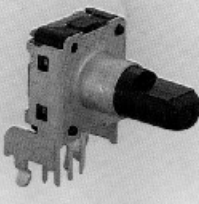
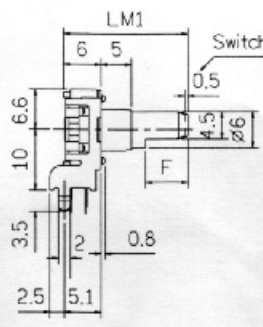
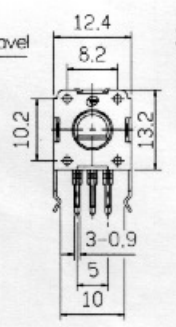
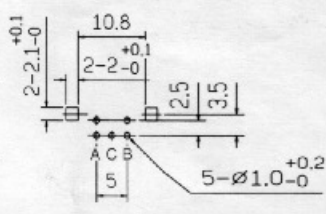

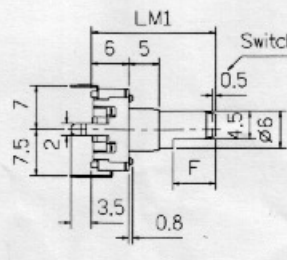
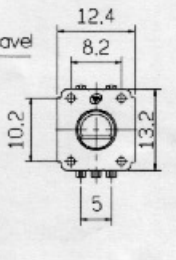
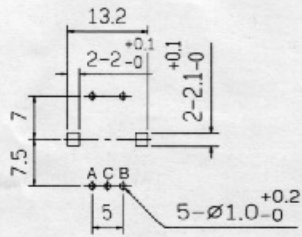
Ratings power	5V DC. 0.5mA (Each Bit)	
Phase-difference	$\Delta T = 0.08T$ min.	$\Delta T = 0.15T \pm 0.1T$ or $0.25T \pm 0.1T$
Insulation resistance	50V DC 100M Ω min	
Voltage proof	50V AC	
Sliding noise	$t_1, t_3 \leq 3\text{ms}$ $t_2 \leq 2\text{ms}$ (Test conditions 360°/s)	
Output signal and rotational direction	 <p>Detent stability point CW direction</p>	 <p>Detent stability point CW direction</p>

■ Push-on switch specifications

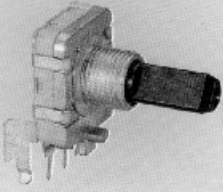
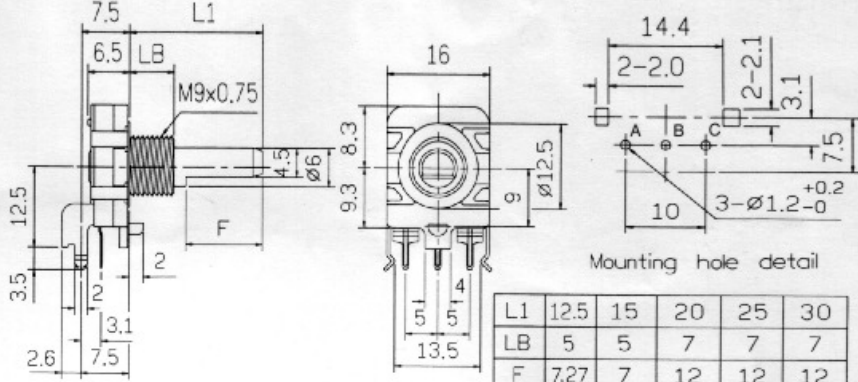

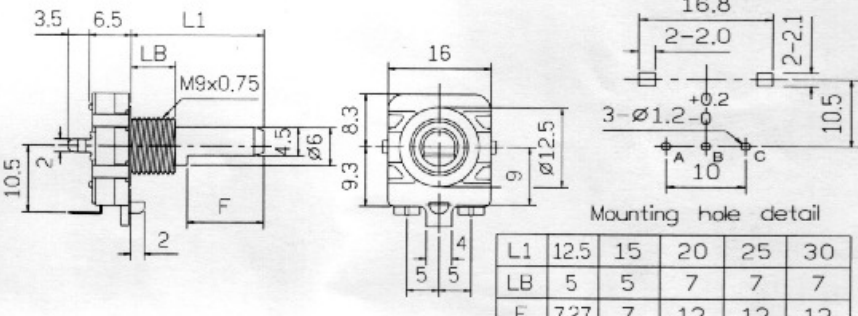
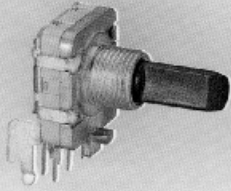
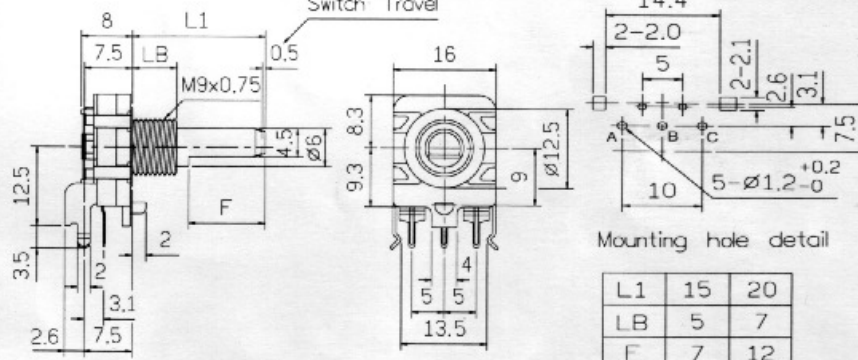
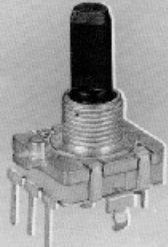
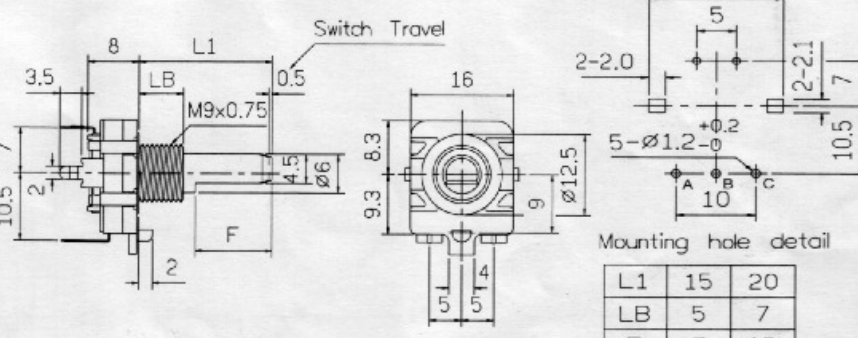
Switch circuit	Single pole and single throw (push on)
Travel of switch (mm)	$0.5 \begin{matrix} +0.4 \\ -0.3 \end{matrix}$
Operating force of switch	$3 \begin{matrix} +1.5 \\ -1.0 \end{matrix} \text{ N} / 360 \begin{matrix} +150 \\ -100 \end{matrix} \text{ gf}$
Ratings power	DC 5V 10mA (minimum ratings DC 5V 1mA)
Contact resistance	First period: 100m Ω , 200m Ω after the end of useful life is reached
Operating life	20,000 cycles min.

INSULATED SHAFT ENCODERS

■ 12mm Size Snap-in Insulated Shaft Encoder

Model	Dimensions												
<p>ED1211 (3) 12mm Size Horizontal Type Encoder</p> 			 <p>Mounting hole detail</p> <table border="1" data-bbox="1157 739 1388 806"> <tr> <td>LM1</td> <td>17.5</td> <td>20</td> <td>25</td> </tr> <tr> <td>F</td> <td>5.0</td> <td>7</td> <td>12</td> </tr> </table>	LM1	17.5	20	25	F	5.0	7	12		
LM1	17.5	20	25										
F	5.0	7	12										
<p>ED1212 (4) 12mm Size Vertical Type Encoder</p> 			 <p>Mounting hole detail</p> <table border="1" data-bbox="1157 1153 1388 1220"> <tr> <td>LM1</td> <td>17.5</td> <td>20</td> <td>25</td> </tr> <tr> <td>F</td> <td>5.0</td> <td>7</td> <td>12</td> </tr> </table>	LM1	17.5	20	25	F	5.0	7	12		
LM1	17.5	20	25										
F	5.0	7	12										
<p>ED1211S 12mm Size Horizontal Type Encoder With Push-on Switch</p> 			 <p>Mounting hole detail</p> <table border="1" data-bbox="1109 1556 1388 1624"> <tr> <td>LM1</td> <td>17.5</td> <td>20</td> <td>25</td> <td>30</td> </tr> <tr> <td>F</td> <td>5.0</td> <td>7</td> <td>12</td> <td>12</td> </tr> </table>	LM1	17.5	20	25	30	F	5.0	7	12	12
LM1	17.5	20	25	30									
F	5.0	7	12	12									
<p>ED1212S 12mm Size Vertical Type Encoder With Push-on Switch</p> 			 <p>Mounting hole detail</p> <table border="1" data-bbox="1109 1971 1388 2038"> <tr> <td>LM1</td> <td>17.5</td> <td>20</td> <td>25</td> <td>30</td> </tr> <tr> <td>F</td> <td>5.0</td> <td>7</td> <td>12</td> <td>12</td> </tr> </table>	LM1	17.5	20	25	30	F	5.0	7	12	12
LM1	17.5	20	25	30									
F	5.0	7	12	12									

■ 16mm Size Snap-in Insulated Shaft Encoder

Model	Dimensions																		
<p>ED1611 16mm Size Horizontal Type Encoder</p> 	 <table border="1" data-bbox="1037 739 1404 840"> <tr> <td>L1</td> <td>12.5</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> </tr> <tr> <td>LB</td> <td>5</td> <td>5</td> <td>7</td> <td>7</td> <td>7</td> </tr> <tr> <td>F</td> <td>7.27</td> <td>7</td> <td>12</td> <td>12</td> <td>12</td> </tr> </table>	L1	12.5	15	20	25	30	LB	5	5	7	7	7	F	7.27	7	12	12	12
L1	12.5	15	20	25	30														
LB	5	5	7	7	7														
F	7.27	7	12	12	12														
<p>ED1612 16mm Size Vertical Type Encoder</p> 	 <table border="1" data-bbox="1037 1142 1404 1243"> <tr> <td>L1</td> <td>12.5</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> </tr> <tr> <td>LB</td> <td>5</td> <td>5</td> <td>7</td> <td>7</td> <td>7</td> </tr> <tr> <td>F</td> <td>7.27</td> <td>7</td> <td>12</td> <td>12</td> <td>12</td> </tr> </table>	L1	12.5	15	20	25	30	LB	5	5	7	7	7	F	7.27	7	12	12	12
L1	12.5	15	20	25	30														
LB	5	5	7	7	7														
F	7.27	7	12	12	12														
<p>ED1611S 16mm Size Horizontal Type Encoder With Push-on Switch</p> 	 <table border="1" data-bbox="1149 1568 1356 1668"> <tr> <td>L1</td> <td>15</td> <td>20</td> </tr> <tr> <td>LB</td> <td>5</td> <td>7</td> </tr> <tr> <td>F</td> <td>7</td> <td>12</td> </tr> </table>	L1	15	20	LB	5	7	F	7	12									
L1	15	20																	
LB	5	7																	
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<p>ED1612S 16mm Size Vertical Type Encoder With Push-on Switch</p> 	 <table border="1" data-bbox="1149 1971 1356 2072"> <tr> <td>L1</td> <td>15</td> <td>20</td> </tr> <tr> <td>LB</td> <td>5</td> <td>7</td> </tr> <tr> <td>F</td> <td>7</td> <td>12</td> </tr> </table>	L1	15	20	LB	5	7	F	7	12									
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