

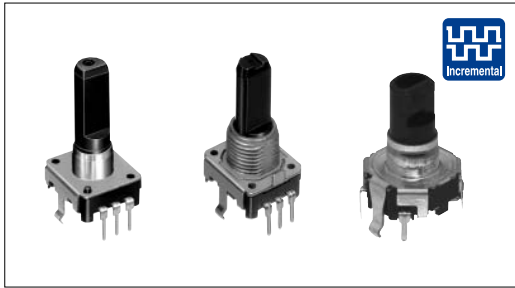
Encoder 12mm Size Insulated Shaft Type

EC12 Series



Insulated shaft type with a wide variety of applications.

- Detector
- Push
- Slide
- Rotary
- Encoders**
- Power
- Dual-in-line Package Type
- TACT Switch™
- Custom-Products
- Incremental Type
- Absolute Type



Typical Specifications

Items		Specifications
Rating		0.5mA 5V DC
Operating life	Without detent	15,000cycles 30,000cycles(Lightest(jog))
	With detent	30,000cycles

Product Line

Actuator length (mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Operating force of switch (N)	Travel of push-on switch (mm)	Minimum order unit (pcs.)	Product No.	Drawing No.
15	Standard 3 to 20	12	12	Vertical	—	—	1,200	EC12E1220407	2
20								EC12E1220406	1
25								EC12E1220405	1
8.5 (Hollow shaft)								EC12E1220301	3
20	Lightest(jog) 3 ± 2	24	24					EC12E1240405	1
25								EC12E1240406	1
8.5 (Hollow shaft)								EC12E1240301	3
15								EC12E24204A2	2
17.5	Standard 3 to 20	24	24					EC12E24204A7	1
20								EC12E24204A8	1
25								EC12E24204A9	1
8.5 (Hollow shaft)								EC12E2420301	3
20	Lightest(jog) 3 ± 2	Without	Without	EC12E24404A8	1				
25				EC12E24404A6	1				
8.5 (Hollow shaft)				EC12E2440301	3				
20				Lightest(jog) 10 max.	Without	EC12E24104A6	1		
25	Standard 25 ± 15	EC12E2430404							
25	EC12E2430401								

Product Line
With Bushing Type

Actuator length(mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Operating force of switch (N)	Travel of push-on switch(mm)	Minimum order unit(pcs.)	Product No.	Drawing No.
25	Standard 3 to 20	12	12	Vertical	—	—	950	EC12E1220813	4
20		24	24					EC12E2420802	
25								EC12E2420801	
30		EC12E2420803							
20	Standard 25 ± 15	Without	24	Vertical	—	—	950	EC12E2430804	4
25								EC12E2430803	
30	Heavy 40 ± 15	Without	24	Vertical	—	—	950	EC12E2460802	4

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Custom-
Products

With Switch Type

Actuator length (mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Operating force of switch (N)	Travel of push-on switch(mm)	Minimum order unit (pcs.)	Product No.	Drawing No.
17.5	5 ± 3	30	15	Vertical	3	0.5	1,280	EC12D1524403	5
	10 ± 5							EC12D1564402	
	5 ± 3				EC12D1524406				
	10 ± 5				EC12D1564404				

Note


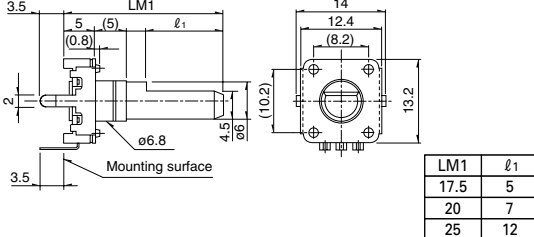
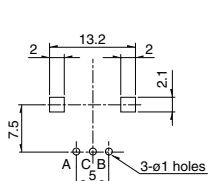

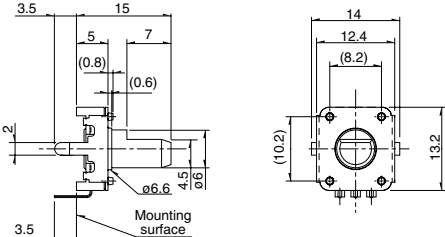
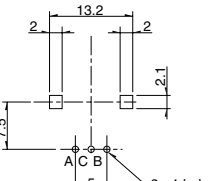
Nuts and washers are not included. If required, please contact us.

Incremental
Type

Absolute
Type

Dimensions


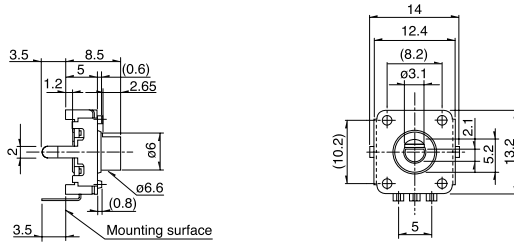
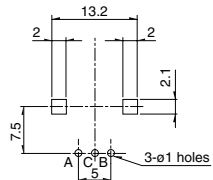

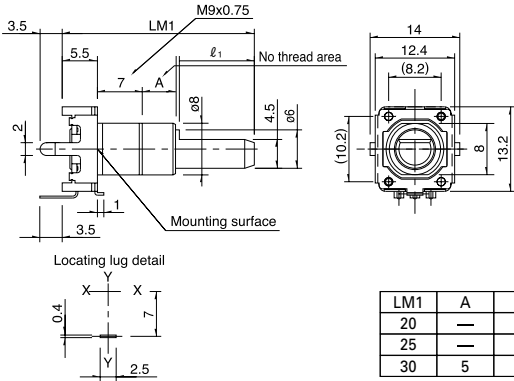
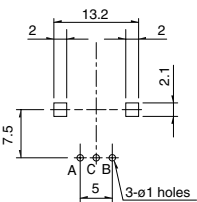


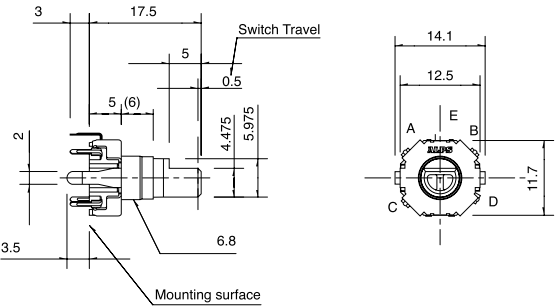
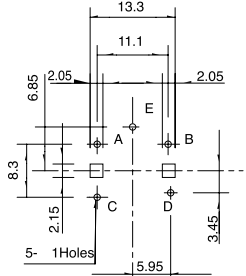
Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting face)								
1		 <table border="1" data-bbox="979 1381 1089 1465"> <tr> <td>LM1</td> <td>ℓ₁</td> </tr> <tr> <td>17.5</td> <td>5</td> </tr> <tr> <td>20</td> <td>7</td> </tr> <tr> <td>25</td> <td>12</td> </tr> </table>	LM1	ℓ ₁	17.5	5	20	7	25	12	
LM1	ℓ ₁										
17.5	5										
20	7										
25	12										
2											

Refer to P.194 for product varieties.

Dimensions

Unit:mm

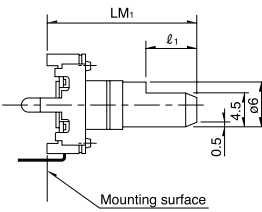
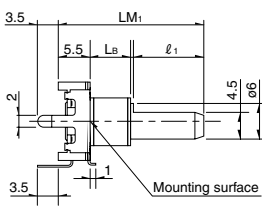
No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)												
3															
4		 <table border="1" data-bbox="925 787 1096 871"> <thead> <tr> <th>LM1</th> <th>A</th> <th>ℓ₁</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>—</td> <td>7</td> </tr> <tr> <td>25</td> <td>—</td> <td>12</td> </tr> <tr> <td>30</td> <td>5</td> <td>12</td> </tr> </tbody> </table>	LM1	A	ℓ ₁	20	—	7	25	—	12	30	5	12	
LM1	A	ℓ ₁													
20	—	7													
25	—	12													
30	5	12													
5	 														

Product Varieties







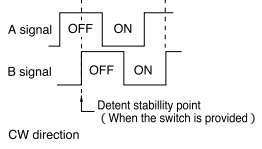
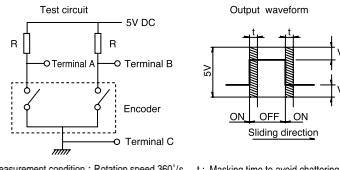
Shaft Dimensions

Flat Type

Unit:mm

<p>With high collar type</p> 	<p>Detailed dimensions</p> <table border="1" data-bbox="1055 1470 1274 1638"> <thead> <tr> <th>LM₁</th> <th>ℓ₁</th> </tr> </thead> <tbody> <tr> <td>17.5</td> <td>5</td> </tr> <tr> <td>20</td> <td>7</td> </tr> <tr> <td>22.5</td> <td>7</td> </tr> <tr> <td>25</td> <td>12</td> </tr> <tr> <td>30</td> <td>12</td> </tr> </tbody> </table>	LM ₁	ℓ ₁	17.5	5	20	7	22.5	7	25	12	30	12			
LM ₁	ℓ ₁															
17.5	5															
20	7															
22.5	7															
25	12															
30	12															
<p>With bushing type</p> 	<p>Detailed dimensions</p> <table border="1" data-bbox="1055 1722 1339 1869"> <thead> <tr> <th>LM₁</th> <th>L_B</th> <th>ℓ₁</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>7</td> <td>7</td> </tr> <tr> <td>25</td> <td>7</td> <td>12</td> </tr> <tr> <td>30</td> <td>12</td> <td>12</td> </tr> <tr> <td>35</td> <td>12</td> <td>12</td> </tr> </tbody> </table> <p>Excluding the 12 detent type</p>	LM ₁	L _B	ℓ ₁	20	7	7	25	7	12	30	12	12	35	12	12
LM ₁	L _B	ℓ ₁														
20	7	7														
25	7	12														
30	12	12														
35	12	12														

List of Varieties

Type	Metal shaft				Insulated shaft			
	11mm size			20mm size	12mm size			
	EC11G	EC11J	EC11K	EC20A/RK203	EC12E Standard detent / Without detent	EC12D With push-on switch		
Photo								
Output	Incremental							
Outline specifications	Shaft types	Single-shaft						
	Operating direction	Vertical						
	Number of pulse/ Number of detent	15/30	9/18 15/30		18/18	12/12 24/24	15/30	
	Push switch (Travel mm)	Without With(1.5)	Without With(0.5, 1.5)		Without With(1.5)	Without	With(0.5)	
	Optional functions							
	Changeover angle							
Dimensions (mm)	W	11.7			2.0	12.4	12.5	
	D	12	14.2		19.2	13.2	11.7	
	H	4.5			10	5		
Soldering	Manual soldering	350 max. 3s max.						
	Dip soldering	260 ± 5 , 5 ± 1s			260 ± 5 , 5 ± 1s	260 ± 5 , 3 ± 1s		
	Reflow soldering	Please see P.189						
Operating temperature range	-30 to +85	-40 to +85		-30 to +80	-10 to +70	-40 to +85		
Maximum operating current (Resistive load)	10mA			1mA	5mA	10mA		
Electrical performance	Output signal	Output of A and B signals, proportionate to phase difference						
	Output wave	Please see P.191						
	Sliding noise	Please see P.191				<p>$V_1 = V_2 = 1.5V$ max.</p>  <p>Measurement condition : Rotation speed 360°/s 1 : Masking time to avoid chattering</p> <p>At R = 10k Chattering : 3ms max. Bounce : 2ms max. At R = 5k Chattering : 3ms max. Bounce : 2ms max.</p>		
	Insulation resistance	100M min. 250V DC			10M min. 50V DC	100M min. 250V DC		
	Voltage proof	300V AC for 1minute			50V AC for 1minute	300V AC for 1minute or 360V AC for 1s.		
	Mechanical performance	Rotational torque	$7 \pm \frac{3}{4}$ mN·m				10mN·m max. 25 ± 15mN·m 40 ± 15mN·m	
Detent torque		10 ± 7mN·m	12 ± 5mN·m		40 ± 20mN·m	3 ± 2 mN·m 3 to 20mN·m	5 ± 3mN·m 10 ± 5mN·m	
Push-pull strength		100N			80N	100N		
Environmental performance	Cold	-40 ± 3 for 240h			-40 ± 3 for 240h ± 10h			
	Dry heat	85 ± 3 for 240h			85 ± 3 for 240h ± 10h			
	Damp heat	60 ± 2 , 90 to 95% RH for 240h			60 ± 2 , 90 to 95%RH for 240h ± 10h			
Push-on Switch Specifications	Circuit · number of contacts	Single pole and single throw (Push-on)					Single pole and single throw (Push-on)	
	Travel (mm)	0.5 ± 0.3	1.5 ± 0.5	0.5 ± 0.3	1.5 ± 0.5	0.5 ± 0.3	0.5 ± 0.3	
	Operating force (N)	$6 \pm \frac{2.5}{2}$	4 ± 2	5 ± 2	4 ± 2	5 ± 2	4 ± 2	$3 \pm \frac{1.5}{1.0}$ $6 \pm \frac{2.5}{2}$
	Rating	0.5A 16V DC (1mA 16V DC min. ratings)		0.1A 5V DC		0.5A 16V DC (1mA 16V DC min. ratings)		1mA 5V DC
	Contact esistance	100m for initial period; 200m after operating life					100m for initial period; 200m after operating life	
	Operating life	20,000times min.	1,000,000 times min.	500,000 times min.	1,000,000 times min.	100,000 times min.	20,000times min.	30,000times min.
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Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line Package Type

TACT Switch™

Custom-Products

Incremental Type

Absolute Type