

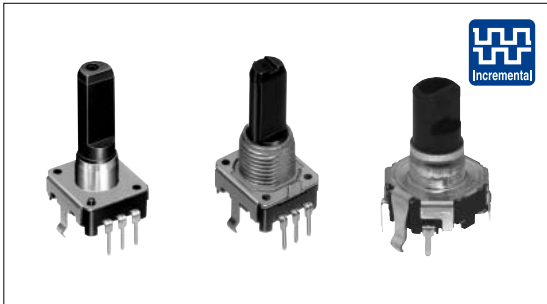
# Encoder 12mm Size Insulated Shaft Type

EC12 Series



Insulated shaft type with a wide variety of applications.

Detector  
Push  
Slide  
Rotary  
**Encoders**



### Typical Specifications

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

Power  
Dual-in-line  
Package Type

TACT Switch™  
Custom-Products

Incremental  
Type  
Absolute  
Type

### 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	
8.5 (Hollow shaft)	Lightest( jog ) 3 ± 2	24	24					EC12E1220301	3
20								EC12E1240405	1
25								EC12E1240406	
8.5 (Hollow shaft)	Lightest( jog ) 3 ± 2	24	24					EC12E1240301	3
15								EC12E24204A2	2
17.5								EC12E24204A7	
20	Standard 3 to 20	24	24					EC12E24204A8	1
25								EC12E24204A9	
8.5 (Hollow shaft)								EC12E2420301	
20	Lightest( jog ) 3 ± 2	Without	Without	EC12E24404A8	1				
25				EC12E24404A6					
8.5 (Hollow shaft)				EC12E2440301	3				
20	Lightest( jog ) 10 max.	Without	Without	EC12E24104A6	1				
25	Standard 25 ± 15			EC12E2430404					
				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								EC12E2460802	

With Switch Type


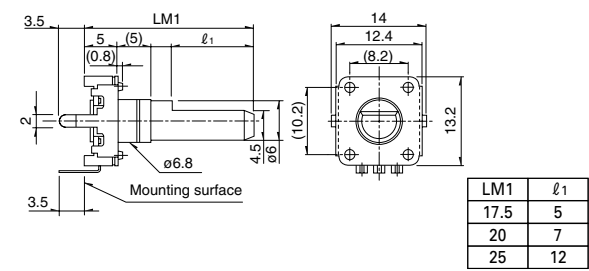
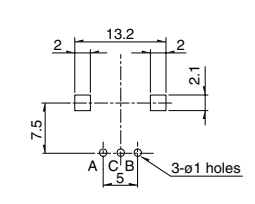

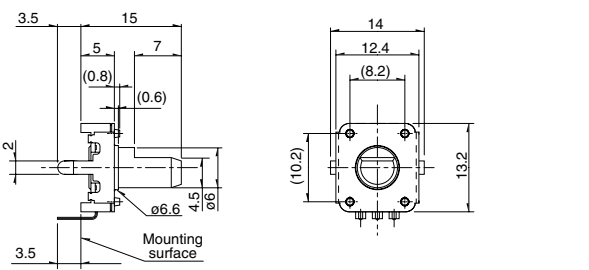
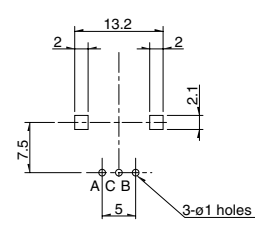
Actuator length (mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Operating force of switch (N)	Travel of push-on switch (mm)	Minimum order unit (pcs.)	Product No.	Drawing No.
17.5	5 ± 3	30	15	Vertical	3	0.5	1,280	EC12D1524403	5
	10 ± 5				6			EC12D1564402	
	5 ± 3				EC12D1524406				
	10 ± 5				EC12D1564404				

**Note**

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

**Dimensions**

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting face)								
1		 <table border="1" data-bbox="973 1456 1101 1568"> <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>25</td> <td>12</td> </tr> </tbody> </table>	LM1	ℓ1	17.5	5	20	7	25	12	
LM1	ℓ1										
17.5	5										
20	7										
25	12										
2											

Refer to P.194 for product varieties.

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

Incremental Type  
Absolute Type

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)												
3															
4		<table border="1"> <thead> <tr> <th>LM1</th> <th>A</th> <th>l<sub>1</sub></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 <sub>1</sub>	20	—	7	25	—	12	30	5	12	
LM1	A	l <sub>1</sub>													
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25	—	12													
30	5	12													
5															

Product Varieties








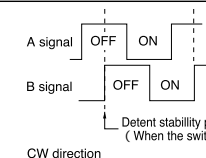
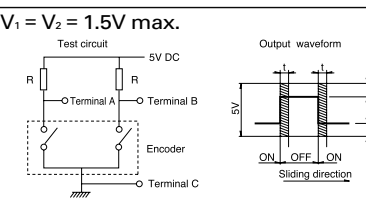
Shaft Dimensions

Flat Type

Unit:mm

<p>With high collar type</p>	<p>Detailed dimensions</p> <table border="1"> <thead> <tr> <th>LM<sub>1</sub></th> <th>l<sub>1</sub></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 <sub>1</sub>	l <sub>1</sub>	17.5	5	20	7	22.5	7	25	12	30	12			
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LM <sub>1</sub>	L <sub>B</sub>	l <sub>1</sub>														
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				
Series	EC11G	EC11J	EC11K	EC20A/RK203	EC12E Standard detent	EC12E 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) Optional functions	Without With( 1.5 )	Without With( 0.5, 1.5 )		Without With( 1.5 )	Without	With( 0.5 )		
	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><math>V_1 = V_2 = 1.5V</math> max.</p>  <p>Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering</p> <p>At R = 10k Chattering : 3ms max. Bounce : 2ms max.</p> <p>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 380V AC for 1s.		
Mechanical performance	Rotational torque	$7 \pm \frac{3}{4} \text{ mN}\cdot\text{m}$		_____		$10 \text{ mN}\cdot\text{m}$ max. $25 \pm 15 \text{ mN}\cdot\text{m}$ $40 \pm 15 \text{ mN}\cdot\text{m}$			
	Detent torque	$10 \pm 7 \text{ mN}\cdot\text{m}$	$12 \pm 5 \text{ mN}\cdot\text{m}$		$40 \pm 20 \text{ mN}\cdot\text{m}$	$3 \pm 2 \text{ mN}\cdot\text{m}$ 3 to 20mN·m	$5 \pm 3 \text{ mN}\cdot\text{m}$ $10 \pm 5 \text{ mN}\cdot\text{m}$		
	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)	$0.5 \pm 0.3$	$1.5 \pm 0.5$	$0.5 \pm 0.3$	$1.5 \pm 0.5$	$0.5 \pm 0.3$	$0.5 \pm 0.3$		
	Operating force(N)	$6 \pm \frac{2}{5}$	$4 \pm 2$	$5 \pm 2$	$4 \pm 2$	$5 \pm 2$	$3 \pm \frac{1.5}{1.0}$   $6 \pm \frac{2.5}{2}$		
	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.		
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- Detector
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