

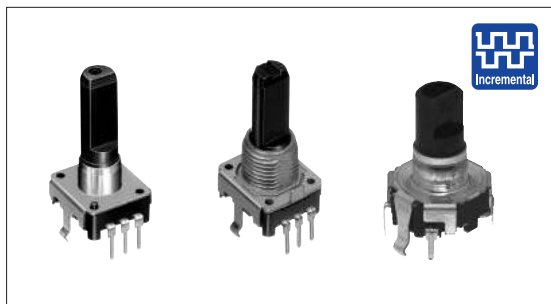
# Encoder 12mm Size Insulated Shaft Type

EC12 Series



Insulated shaft type with a wide variety of applications.

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



## Features

- A high resolution of 12-pulse/12-detent and 24-pulse/24-detent in 12mm size.
- The adoption of a new shaft and bushing create a comfortable feel with high accuracy.
- Incremental type.
- A new variation - round shape with push switch EC12D type (15 pulse/30 detent) has been added to the lineup.

## Applications

- For various types of control in DVD players/recorders, mini component stereos, CD players, portable audio, monitors and various AV equipment
- For controlling mixing consoles and electronic music instruments
- ECD12D (New product, with push switch): for volume control in car audio and navigation systems.
- For home appliances (microwave ovens)

## Typical Specifications

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

- 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 packing 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)	Standard 3 to 20	24	24					EC12E1240301	3
15								EC12E24204A2	2
17.5								EC12E24204A7	1
20	EC12E24204A8								
25	EC12E24204A9								
8.5 (Hollow shaft)	Lightest (jog) 3±2	Without	24					EC12E2420301	3
20				EC12E24404A8	1				
25				EC12E24404A6					
8.5 (Hollow shaft)	Lightest (jog) 10 max.	Without	24	EC12E2440301	3				
20				EC12E24104A6	1				
25				EC12E2430404					
25	Standard 25±15	Without	24	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 packing 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	EC12E2430804					
25				EC12E2430803					
30				EC12E2460802					
30	Heavy 40±15								

**With Switch Type**


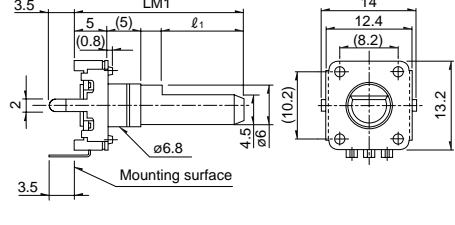
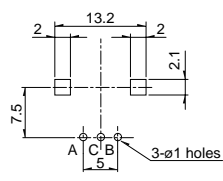

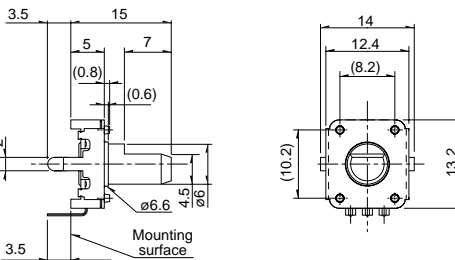
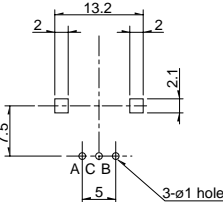
Actuator length (mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Operating force of switch (N)	Travel of push-on switch (mm)	Minimum packing unit (pcs.)	Product No.	Drawing No.
17.5	5±3	30	15	Vertical	3	0.5	1,280	EC12D1524403	5
	10±5							EC12D1564402	

**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 1243 1093 1332"> <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	<b>Short shaft</b> 										

Detector  
Push  
Slide  
Rotary

Encoders

Power

Dual-in-line Package Type

Multi Control Devices

TACT Switch™

Custom-Products

Incremental Type

Absolute Type

Refer to P.199 for product varieties.  
Refer to P.200 for product specifications.

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>													
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"> <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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17.5	5															
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25	12															
30	12															
<p>With bushing type</p>	<p>Detailed dimensions</p> <table border="1"> <thead> <tr> <th>LM<sub>1</sub></th> <th>L<sub>B</sub></th> <th>l<sub>1</sub></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 <sub>1</sub>	L <sub>B</sub>	l <sub>1</sub>	20	7	7	25	7	12	30	12	12	35	12	12
LM <sub>1</sub>	L <sub>B</sub>	l <sub>1</sub>														
20	7	7														
25	7	12														
30	12	12														
35	12	12														

# Product Specifications

Items	EC12E		EC12D	
	Standard detent	Without detent	With push-on switch	
Operating temperature range	-10°C to +70°C		-40°C to +85°C	
Maximum operating current (Resistive load)	5mA		10mA	
Electrical performance	Rating	0.5mA 5V DC		
	Output signal	Output of A and B signals, proportionate to phase difference		
	Output wave			
	Sliding noise	$V_1=V_2=1.5V$ max. 		
		Measurement condition : Rotation speed 360°/s    t : Masking time to avoid chattering		
		At R = 10kΩ Chattering : 3ms max. Bounce : 2ms max.		
		At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.		
Insulation resistance	10MΩ min. 50V DC		100MΩ min. 250V DC	
Voltage proof	50V AC 1minute		300V AC 1minute or 360V AC 1s	
Mechanical performance	Rotational torque	10mN·m max.		
		$25 \pm 15mN \cdot m$		
		$40 \pm 15mN \cdot m$		
	Detent torque	$3 \pm 2mN \cdot m$		
		3 to 20mN·m		
Push-pull strength	80N		100N	
Resistance to soldering heat	Manual soldering	350°C max. 3s max.		
	Dip soldering	$260 \pm 5^\circ C$ , $3 \pm 1s$		
	Reflow soldering	_____		
Durability	Rotational life	30,000cycles	15,000cycles	30,000cycles
Environmental performance	Cold	$-40 \pm 3^\circ C$ for 240h $\pm 10h$		
	Dry heat	$85 \pm 3^\circ C$ for 240h $\pm 10h$		
	Damp heat	$60 \pm 2^\circ C$ , 90 to 95%RH for 240h $\pm 10h$		

Detector

Push

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## Push-on Switch Specifications

Items	EC12D
Circuit · number of contacts	Single pole and single throw (Push-on)
Travel (mm)	$0.5 \pm 0.3$
Operating force (N)	$3 \pm 1.0$
Rating	1mA 5V DC
Contact resistance	100mΩ max.
Operating life	30,000times min.