

Encoder 12mm Size Insulated Shaft Type

EC12 Series



Insulated shaft type with a wide variety of applications.

Detector

Push

Slide

Rotary

Encoders

Power

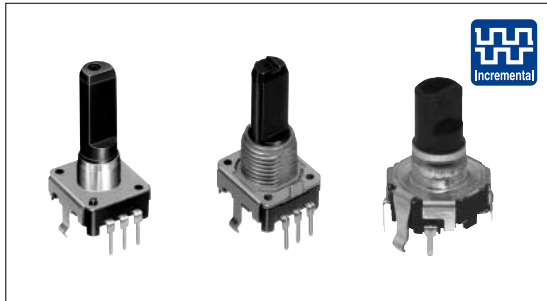
Dual-in-line
Package Type

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	
8.5 (Hollow shaft)								Lightest(jog) 3 ± 2	EC12E1220301
20	EC12E1240405								1
25	EC12E1240406								
8.5 (Hollow shaft)	Standard 3 to 20								EC12E1240301
15								EC12E24204A2	2
17.5		EC12E24204A7	1						
20		EC12E24204A8							
25		EC12E24204A9							
8.5 (Hollow shaft)		Lightest(jog) 3 ± 2	EC12E2420301					3	
20			EC12E24404A8					1	
25			EC12E24404A6						
8.5 (Hollow shaft)	Lightest(jog) 10 max.		Without					EC12E2440301	3
20		EC12E24104A6						1	
25		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						EC12E2430804	
25								EC12E2430803	
30	Heavy 40 ± 15							EC12E2460802	

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

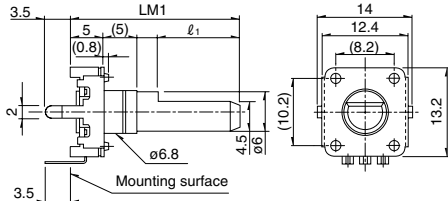
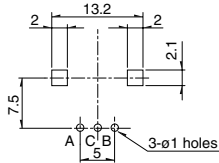
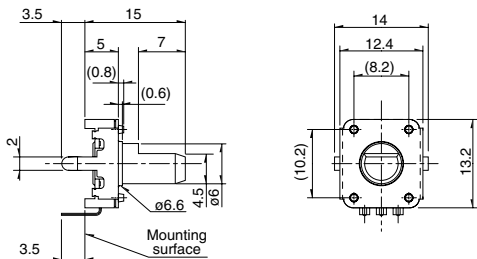
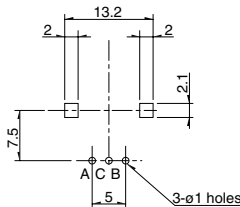
Nuts and washers are not included. If required, please contact us.

Incremental
Type

Absolute
Type

Dimensions

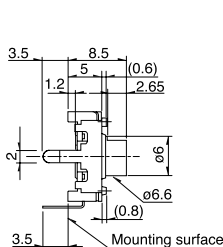
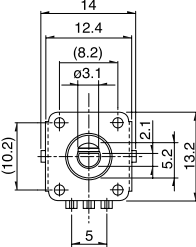
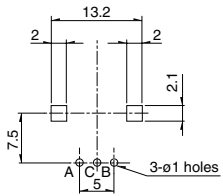
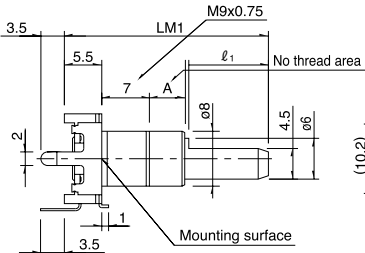
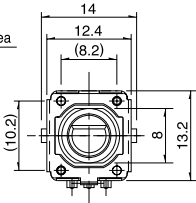
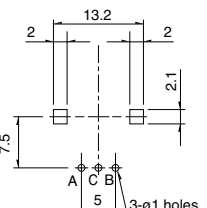
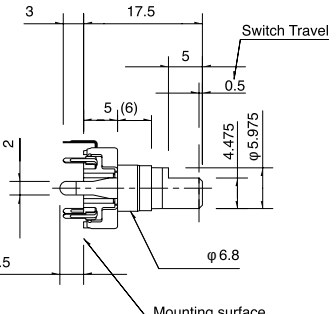
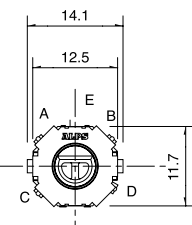
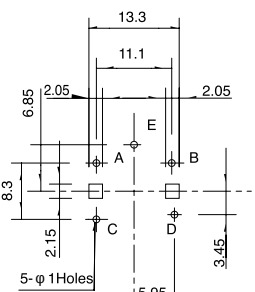
Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting face)								
1		 <table border="1" data-bbox="976 1473 1098 1563"><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	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 data-bbox="920 844 1102 934"><tr><th>LM1</th><th>A</th><th>ℓ₁</th></tr><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></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

With high collar type

Detailed dimensions

LM ₁	ℓ ₁
17.5	5
20	7
22.5	7
25	12
30	12

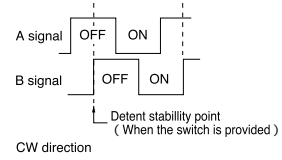
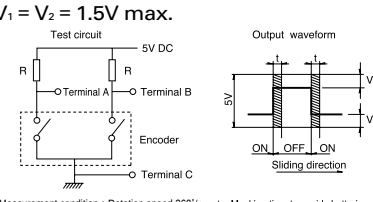
With bushing type

Detailed dimensions

LM ₁	L _B	ℓ ₁
20	7	7
25	7	12
30	12	12
35	12	12

Excluding the 12 detent type

List of Varieties

Type		Metal shaft				Insulated shaft			
		11mm size			20mm size	12mm size			
Series		EC11G	EC11J	EC11K	EC20A/RK203	EC12E	EC12D		
						Standard detent Without detent	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				$V_1 = V_2 = 1.5V$ 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	100MΩ min. 250V DC			10MΩ min. 50V DC		100MΩ 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	$7 \pm \frac{3}{4} \text{ mN} \cdot \text{m}$				$10 \text{ mN} \cdot \text{m}$ 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 ± 0.3	1.5 ± 0.5	0.5 ± 0.3	1.5 ± 0.5	0.5 ± 0.3	1.5 ± 0.5		
	Operating force(N)	$6 \pm \frac{2.5}{2}$	4 ± 2	5 ± 2	4 ± 2	5 ± 2	4 ± 2		
	Rating	0.5A 16V DC (1mA 16V DC min. ratings)		0.1A 5V DC		0.5A 16V DC (1mA 16V DC min. ratings)			
	Contact esistance	100mΩ for initial period; 200mΩ 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.		
Page		181		187		190		192	

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Custom-
ProductsIncremental
TypeAbsolute
Type