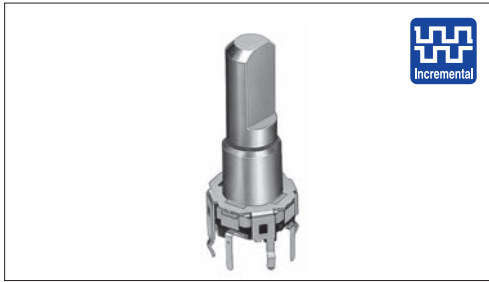


A compact 9.5mm size and round shape contribute to save space.

- Detector
- Slide
- Push
- Rotary
- Encoders



Typical Specifications

Items	Specifications
Rating	10mA 5V DC
Operating life	15,000cycles
Operating temperature range	- 40°C to + 85°C

- Power
- Dual-in-line Package Type
- TACT Switch™

Product Line

Shaft configuration	Length of the shaft (mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Push-on switch	Travel of push-on switch (mm)	Minimum order unit (pcs.)		Product No.	Drawing No.
								Japan	Export		
Flat	15	8 ± 5	30	15	Vertical	Without	—	700	1,400	EC09E1520406	1
	20					With	0.5			EC09E1524405	
						1.5	EC09E1524404				

Note

Other varieties are also available. Please inquire.

Packing Specifications

Tray

Number of packages (pcs.)	Export package measurements (mm)
700	374 × 529 × 213

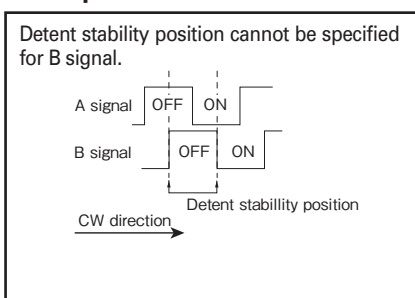
- Metal Shaft
- Insulated Shaft
- Hollow Shaft
- Ring Type

Dimensions

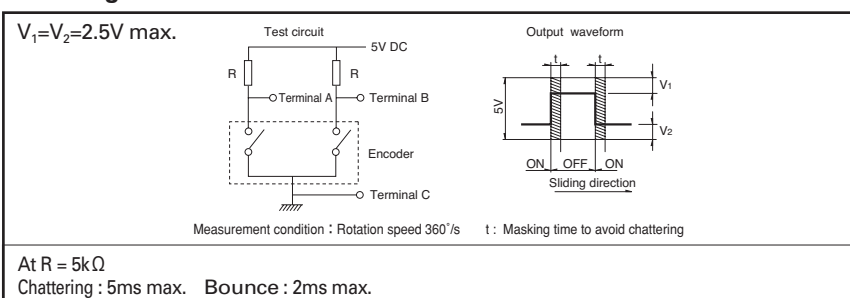
Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting face)
1			
2			











Output Wave



Sliding Noise



## List of Varieties

Type	Metal shaft											
	9mm size		11mm size									
Series	EC09E		EC11B		EC11E				EC11G			
Photo												
Output	Incremental (Two phase A and B )											
Shaft types	Single-shaft					Dual-shaft		Single-shaft				
Operating direction	Vertical		Horizontal		Vertical							
Number of pulse / Number of detent	15 / 30				9 / 18 15 / 30 or Without 18 / 36 or Without				15 / 30 or Without			
Features	—		—		Without detent Push-lock mechanism			—		Less shaft wobble		
Dimensions (mm)	W		9.5		11.7							
	D		13.8		12							
	H		4.5		5.5		4.5		8 / 8.5	4.5		
Operating temperature range	-40°C to + 85°C											
Operating life	15,000 cycle											
Automotive use	●		●		●				●			
Life cycle (availability)												
Electrical performance	Rating		10mA 5V DC									
	Max./min. operating current (Resistive load)		10mA / 1mA									
	Insulation resistance		100M Ω min. 250V DC									
	Voltage proof		300V AC for 1 minute or 360V AC for 1s		300V AC for 1 minute or 360V AC for 2s							
Mechanical performance	Rotational torque (Without detent)		—		7 ± ¼ mN·m		—		8.5 ± 5 mN·m			
	Detent torque		8 ± 5mN·m		12 ± 7mN·m		10 ± 7mN·m			12 ± 7 mN·m		
	Push-pull strength		100N									
Shaft configuration	Flat		Flat, Slotted, Serrated				Inner-shaft: Flat Outer-shaft: Slotted		Serrated			
Terminal type	Insertion											
Switch Specifications	Switch type		Push-on switch				Push-lock mechanism switch※	Push-on switch				
	Contact arrangement		Single pole and single throw (Push-on)									
	Travel (mm)		0.5 ± 0.3	1.5 ± 0.5	0.5 ± 0.4 0.3	1.5 ± 0.5	0.5 ± 0.3	1.5 ± 0.5	8 ± 0.8	0.5 ± 0.3	1.5 ± 0.5	1.5 ± 0.35
	Operating force (N)		6 ± 2.5 2	4 ± 2	6 ± 3	5 ± 2	6 ± 2.5 2	4 ± 2	8 max.	6 ± 2.5 2	4 ± 2	5 ± 2
	Rating		10mA 5V DC		0.1A 5V DC (500 μA 5V DC min. ratings)							
	Contact resistance		100m Ω max. for initial period; 200m Ω max. after operating life.									
	Operating life		10,000 times min.		25,000 times min.	20,000 times min.			10,000 times min.	20,000 times min.		
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### Notes

1. ※ marked specification is only applicable to EC11E152U402.
2. ● indicates applicability to all products in the series.

Detector

Slide

Push

Rotary

Encoders

Power

Dual-in-line  
Package Type

TACT Switch™

Metal  
Shaft

Insulated  
Shaft

Hollow  
Shaft

Ring  
Type

## Encoders Soldering Conditions

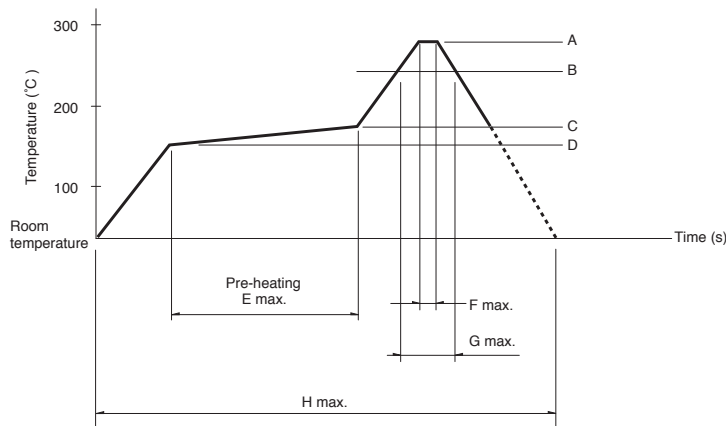
### Reference for Hand Soldering

Series	Tip temperature	Soldering time	No. of solders
EC05E, EC09E, EC10E, EC111, EC11B, EC11E, EC11G, EC11K, EC12D, EC12E, EC18A, EC20A, EC21A, EC28A, EC35A, EC35AH, EC35B, EC40A, EC45A, EC50A, EC60A, EM20B	350°C max.	3s max.	1 time
EC11J	350±10°C	3 <sup>+1</sup> <sub>0</sub> s	2 time

### Reference for Dip Soldering

Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
EC09E, EC11B, EC111, EC11E, EC11G, EC11K, EC18A, EC20A, EC21A, EC28A, EC35A, EC35AH, EC35B, EC50A	100°C max.	2 min. max.	260±5°C	5±1s	2 time max.
EC10E, EC12D, EC12E	100°C max.	1 min. max.	260±5°C	3±1s	2 time max.
EC40A	110°C max.	1 min. max.	260°C max.	10s max.	1 time
EC45A, EC60A	100°C max.	2 min. max.	260°C max.	5s max.	2 time max.
EM20B	80°C max.	1 min. max.	260°C max.	3s max.	2 time max.

### Condition for Reflow Temperature profile



Series	A	B	C	D	E	F	G	H	No. of reflows
EC11J	260°C	230°C	180°C	150°C	2 min.max.	3s	40s	4 min. max	2 time max.
EC05E	250°C min.	230°C min.	180°C	150°C	60s to 120s	—	30s to 40s	—	2 time max.

### Notes

1. When using an infrared reflow oven, solder may sometimes not be applied. Be sure to use a hot air reflow oven or a type that uses infrared rays in combination with hot air.
2. The temperatures given above are the maximum temperatures at the terminals of the potentiometer when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the potentiometer may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the potentiometer does not rise to 250°C or greater.
3. Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.