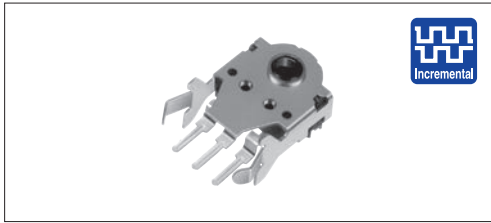


EC10E

10mm Size Hollow Shaft Type



A series of compact and long-life encoders with unique hollow shaft design.



Typical Specifications

Items	Specifications
Rating	1mA 5V DC
Operating life	100,000cycles
Operating temperature range	-5°C to +45°C -30°C to +85°C (For Automotive)

Product Line

Mount height (mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Minimum order unit (pcs.)		Product No.
					Japan	Export	
7	5 ± 3	24	12	Horizontal	1,600	3,200	EC10E1220505
9							EC10E1220501
11							EC10E1220503
7	6 ± 3	12					EC10E1260502

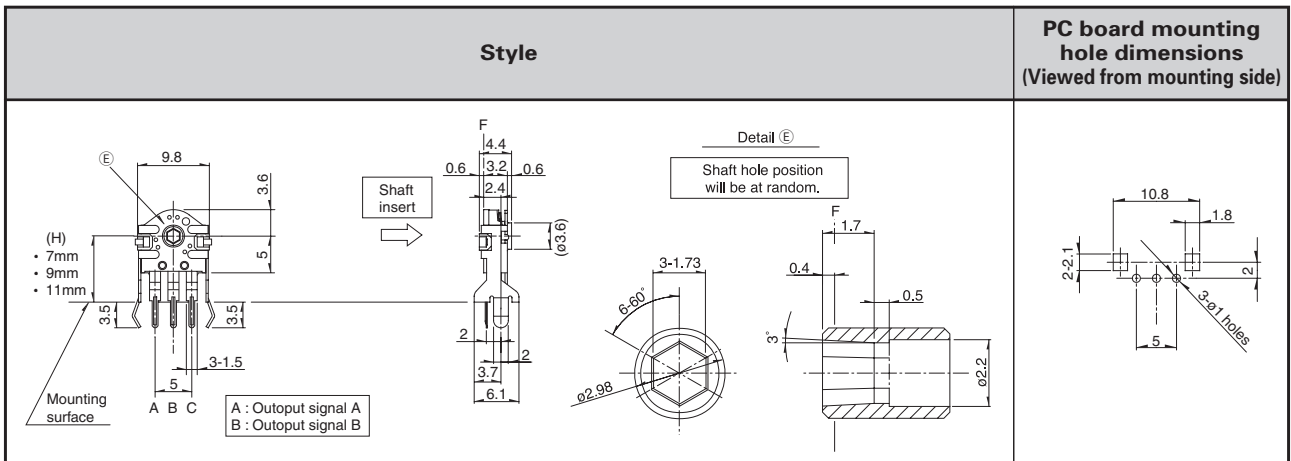
Packing Specifications

Bulk

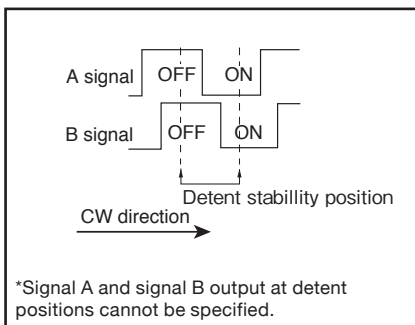
Number of packages (pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
1,600	3,200	270 × 360 × 155

Dimensions

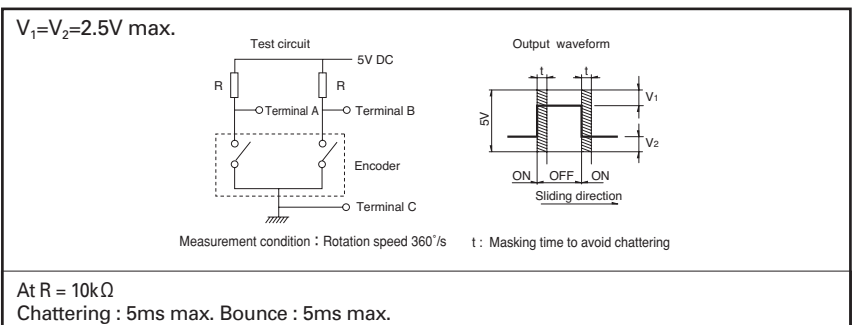
Unit:mm



Output Wave






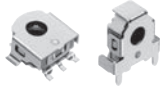






Sliding Noise



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

Metal Shaft
Insulated Shaft
Hollow Shaft
Ring Type

List of Varieties

Type	Insulated Shaft Type			Hollow Shaft Type			
	12mm size		18mm size	5mm size	10mm size		
Series	EC12E	EC12D	EC18A	EC05E	EC10E		
Photo							
Output	Incremental (Two phase A and B)		Absolute type	Incremental (Two phase A and B)			
Shaft types	Single-shaft			Hollow shaft			
Operating direction	Vertical			Vertical	Horizontal		
Number of pulse / Number of detent	12 / 12 24 / 24 24 / Without	15 / 30	12 positions 16 positions	12 / 12	12 / 24 12 / 12		
Features	—	With push-on switch	Water Resisting Performance (IPX7)	Surface Mount Type	—		
Dimensions (mm)	W	12.4	12.5	20	5.7	7.5	9.8
	D	13.2	11.7	18	6	3.3	4.4
	H	5		8.75	2.7	7.25	10.6 / 12.6 / 14.6
Operating temperature range	-10°C to + 70°C	-40°C to + 85°C	- 20°C to + 60°C	- 30°C to + 85°C	- 5°C to + 45°C - 30°C to + 85°C (For Automotive)		
Operating life	15,000 cycles 30,000 cycles	30,000 cycles		100,000 cycles			
Automotive use	—	●	—	—	○		
Life cycle (availability)							
Electrical performance	Rating	0.5mA 5V DC	1mA 5V DC	1mA 10V DC	0.55mA 5.5V DC	1mA 5V DC	
	Max./min. operating current (Resistive load)	5mA / 0.5mA	10mA / 1mA	—	0.55mA / —	—	
	Insulation resistance	10MΩ min. 50V DC	100MΩ min. 250V DC	10MΩ min. 250V DC	50MΩ min. 50V DC		
	Voltage proof	50V AC for 1 minute	300V AC for 1 minute or 360V AC for 1s	50V AC for 1 minute or 60V AC for 2s	50V AC for 1 minute		
Mechanical performance	Rotational torque (Without detent)	10mN·m max. 25 ± 15mN·m 40 ± 15mN·m	—	—	—	—	
	Detent torque	3 ± 2mN·m 3 to 20mN·m	5 ± 3mN·m 10 ± 5mN·m	60 ± 20mN·m	1.6 ± 1.3mN·m	5 ± 3mN·m 6 ± 3mN·m	
	Push-pull strength	80N	100N	Push 100N / pull 50N	—		
Shaft configuration	Flat, Hollow Shaft	Flat		Hollow shaft			
Terminal type	Insertion			Reflow	Insertion		
Switch Specifications	Switch type	—	Push-on switch	—	—	—	
	Contact arrangement	—	Single pole and single throw (Push-on)	—	—	—	
	Travel (mm)	—	0.5 ± 0.3	—	—	—	
	Operating force (N)	—	3 ^{+1.5} ₋₁ 6 ^{+2.5} ₋₂	—	—	—	
	Rating	—	1mA 5V DC	—	—	—	
	Contact resistance	—	100mΩ max. for initial period; 200mΩ max. after operating life.	—	—	—	
	Operating life	—	30,000times min.	—	—	—	
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Detector

Slide

Push

Rotary

Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Metal
Shaft

Insulated
Shaft

Hollow
Shaft

Ring
Type

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Notes

1. The operating temperature range for automotive applications can be raised upon request. Please contact us for details.
2. ● indicates applicability to all products in the series, while ○ indicates applicability to some products in the series.

Encoders Soldering Conditions

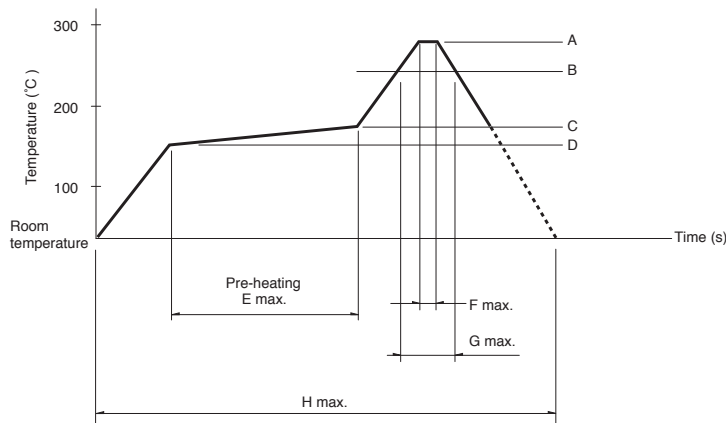
Reference for Hand Soldering

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 ⁺¹ ₀ 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.

Detector

Slide

Push

Rotary

Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Metal
Shaft

Insulated
Shaft

Hollow
Shaft

Ring
Type