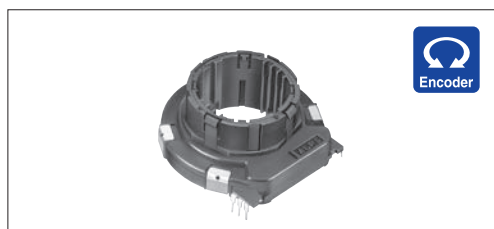


EC45A 45mm Size Ring Type

Large ring, heavy torque device perfect for large ring knob design



Typical Specifications



Items	Specifications
Rating(max.)	0.5mA 5V DC
Operating life	30,000 cycles
Operating temperature range	-40°C to +85°C

Product Line

Output code	Positions	Rotational angle	Detent torque (mN·m)	Minimum order unit (pcs.)		Product No.
				Japan	Export	
5bit Gray code	31	240°	36±16	280	560	EC45AG520402

Note

Other varieties are also available. Please inquire.

Packing Specifications

Tray

Number of packages (pcs.)		Export package measurements (mm)
1 case /Japan	1 case /export packing	
280	560	525×375×477

Dimensions

Style	PC board mounting hole dimensions (Viewed from mounting side)

Standard Codes (Number of Positions : 31)

Code	Terminal	Position																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Gray	4	●	●			●	●			●	●			●	●			●	●			●	●			●	●			●	●	
	2		●		●	●					●	●	●	●					●	●	●	●					●	●	●	●		
	3			●	●	●	●	●	●	●	●	●									●	●	●	●	●	●	●	●				
	5								●	●	●	●	●	●	●	●		●	●	●	●	●	●	●								
	6																	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

1. The ● marks shows the ON position.

2. The ● marks : Connections between terminals and the common terminal (terminal No. =1) are ON.

Refer to P.307 for soldering conditions.

Encoders

List of Varieties

Type			Ring type					
			40mm size		45mm size	50mm size	60mm size	
Series			EC40A	EC45A	EC50A	EC60B		
Photo								
Output			Incremental (Two phase A and B)	Absolute type	Incremental (Two phase A and B)			
Shaft types			Ring type					
Number of pulse / Number of detent			15/30	31 positions	9/18	15/30		
Dimensions (mm)	W		40.4	44.5	50.8	62.4		
	D		43	45	50	60		
	H		9		6.5	7.5		
Operating temperature range			-40℃ to +85℃					
Operating life			30,000 cycles		40,000 cycles			
Automotive use								
Life cycle (availability)								
Electrical performance	Rating		0.5mA 5V DC		1mA 5V DC	10mA 5V DC		
	Max./min. operating current (Resistive load)		—	—	—	—		
	Insulation resistance		10MΩ min. 50V DC		10MΩ min. 250V DC	100MΩ min. 250V DC		
	Voltage proof		50V AC for 1 minute	50V AC for 1 minute or 60V AC for 2s		300V AC for 1 minute or 360V AC for 1s		
Mechanical performance	Detent torque		20±11mN·m 40±16mN·m	36±16mN·m	40±14mN·m	40±10mN·m		
	Push-pull strength	Push	100N					
		Pull	50N			100N		
Shaft configuration			Ring type					
Terminal type			Insertion					
Switch Specifications	Switch type		—	—	—	—		
	Contact arrangement		—	—	—	—		
	Travel (mm)		—	—	—	—		
	Operating force (N)		—	—	—	—		
	Switch ON position		—	—	—	—		
	Rotational torque		—	—	—	—		
	Rating		—	—	—	—		
	Contact resistance		—	—	—	—		
	Operating life		—	—	—	—		
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Encoders Soldering Conditions 307
 Encoders Cautions 308

Note
 ● Indicates applicability to all products in the series.

Reference for Manual Soldering

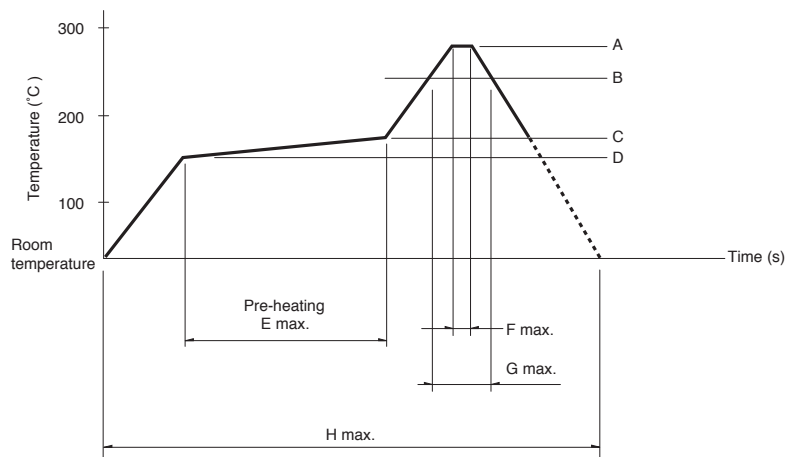
Series	Tip temperature	Soldering time	No. of solders
EC05E, EC09E, EC10E, EC111, EC11B, EC11E, EC11G, EC11K, EC12D, EC12E, EC18A, EC21A, EC28A, EC35A, EC35AH, EC35B, EC40A, EC45A, EC50A, EC60B, EM11B, EM20B, EC21C	350°C max.	3s max.	1 time
EC11J	350±10°C	3 ⁺¹ ₀ s	2 time

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, EC21A, EC28A, EC35A, EC35AH, EC35B, EC50A, EC60B	100°C max.	2 min. max.	260±5°C	5±1s	2 time max.
EC10E, EC12D, EC12E, EM11B	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	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.

Example of Reflow Soldering Condition

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.
EC21C	230°C to 245°C	220°C	200°C	150°C	60s to 120s	—	25s to 60s	300 max.	1 time max.

注記

- 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.
- The temperatures given above are the maximum temperatures at the terminals of the encoder when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the encoder may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the encoder does not rise to 250°C or greater.
- Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.