

Hollow Shaft Type Devices

45mm Size Encoder/Potentiometer

EC45A/RK45A Series



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

Hollow Shaft
Type Devices



Typical Specifications

Items	Specifications	
	Encoder	Potentiometer
Rating(max.)	0.5mA 5V DC	0.05W
Operating life	30,000cycles	

Product Line

Encoder(Incremental type)

Number of detent	Number of pulse	Detent torque (mN·m)	Minimum order unit (pcs.)	Product No.	Drawing No.
30	15	30 ± 14	200	EC45A1520404	1

Encoder(Absolute type)

Output code	Positions	Rotational angle	Detent torque (mN·m)	Minimum order unit (pcs.)	Product No.	Drawing No.
5bit Gray code	31	240 °	36 ± 16	200	EC45AG520402	2

Potentiometer

Total resistance	Resistance taper	Positions	Rotational angle	Detent torque (mN·m)	Minimum order unit (pcs.)	Product No.	Drawing No.
10k Ω	B	5	240 °	50 ± 20	200	RK45A1100004	3

Encoder
Type

Potentiometer
Type

Note

Products other than those listed in the above chart are also available. Please contact us for details.

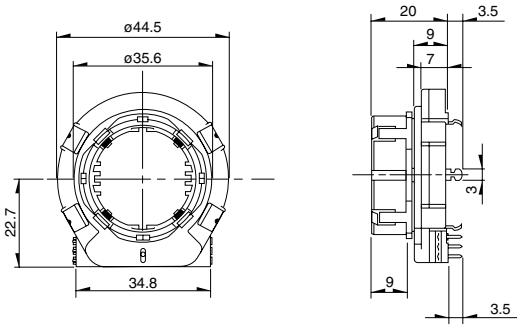
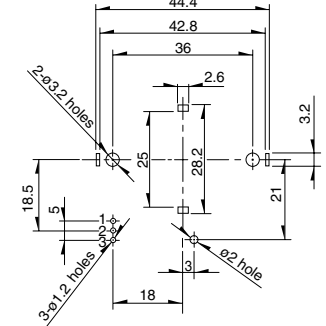
Dimensions

Unit:mm

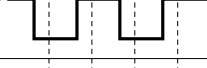
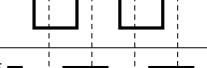
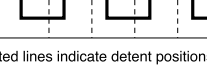
No.	Photo	Style	PC board mounting hole dimensions (Viewed from switch mounting face)
1	EC45A Incremental Type 		
2	EC45A Absolute Type 		

Dimensions

Unit:mm

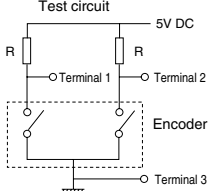
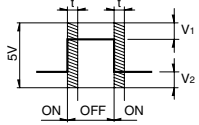
No.	Photo	Style	PC board mounting hole dimensions (Viewed from switch mounting face)
3			

Output Wave(Incremental Type)

Shaft rotational Direction	Signal	Output
Clockwise direction	A(Terminal 1-3)	OFF  ON
	B(Terminal 2-3)	OFF  ON
Counter-clockwise direction	A(Terminal 1-3)	OFF  ON
	B(Terminal 2-3)	OFF  ON

The dotted lines indicate detent positions.

Sliding Noise(Incremental Type)

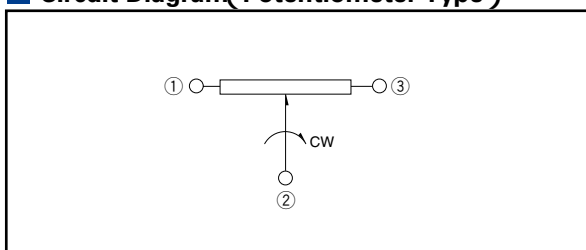
$V_1 = V_2 = 2.5V \text{ max.}$  Measurement condition : Rotation speed 360°/s	Output waveform  t : Masking time to avoid chattering
At R = 10kΩ Chattering : 3ms max. Bounce : 2ms max.	

Standard Codes(Absolute Type)

Number of positions																																	31
		Terminal		Position																													
Code		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																	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

- The • marks shows the ON position.
- The • marks : Connections between terminals and the common terminal(terminal No. =1)are ON.

Circuit Diagram(Potentiometer Type)



List of Varieties

Type		Encoder						
		21mm size	28mm size	35mm size		40mm size	45mm size	60mm size
Series		EC21A	EC28A	EC35AH	EC35B	EC40A	EC45A	EC60A
Photo								
Output		Incremental		ABC	Incremental/ Self-return switch	Incremental		Absolute
Outline specifications	Shaft types	Hollow shaft						
	Operating direction	Vertical						
	Number of pulse/ Number of detent	9/18 15/30	15/30	6×ABC / 18 10×ABC / 30	15/30		31 Position	15 / 30
	Push switch(Travel mm)	Without						
	Optional functions							
	Changeover angle	—			12 °		—	12 °
Dimensions (mm)	W	21.6	28	35	35	40.4	44.5	61.8
	D		29		37	41.6	45	
	H	4		15	21.35	9		11.5
Soldering	Manual soldering	350 max. 3s max.						
	Dip soldering	260 ± 5 , 5 ± 1s				260 max. 5s max.		
	Reflow soldering							
Operating temperature range		-40 to +85						
Electrical performance	Output voltage	2.5V max. at 5V DC,1mA (resistive load)		2.5V max. at 5V DC,0.5mA (resistive load)	2.5V max. at 5V DC,1mA (resistive load)	2.5V max.at 5V DC,0.5mA (resistive load)		
	Insulation resistance	100MΩ min. 250V DC				10MΩ min. 50V DC		10MΩ min. 500V DC
	Voltage proof	300V AC for 1minute				50V AC for 1minute		500V AC for 1minute
Mechanical performance	Rotational torque		16 ± 7mN· m	12 ± 7mN· m 20 ± 10mN· m	18 ± 7mN· m	20 ± 10mN· m	20 ± 11mN· m	Shall be in accordance with individual specifications. 40 ± 20mN· m
	Terminal strength		5N for 1minute				3N for 10s.	
	Actuator strength	Rotational direction	100N					
		Push direction	100N				50N	
	Vibration		10 to 55 to 10Hz/min., the amplitude is 1.5mm for all the frequencies, in the 3 direction of X, Y and Z for 2 hours respectively					
Environmental performance	Cold	-40 ± 2 for 240h		-40 ± 3 for 240h				
	Dry heat	85 ± 2 for 240h		85 ± 3 for 240h				
	Damp heat	60 ± 2 , 90 to 95%RH for 240h				40 ± 2 , 90 to 95%RH for 240h		
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Self-return Switch Specifications

Items	EC35B
Circuit · number of contacts	Single pole and double throw(Self-return)
Travel(mm)	2.8 ± 0.5
Push operating force(N)	3.8 ± 1.5
Switch ON position	15 ± 5 °
Rotational torque	40 ± 25mN·m
Rating	10mA 5V DC
Contact resistance	200mΩ max.
Operating life	15,000cycles

- Hollow Shaft Type Device Cautions465, 466, 467

Note

※ The operating temperature range for automotive applications can be raised upon request. Please contact us for requirements of this kind.