

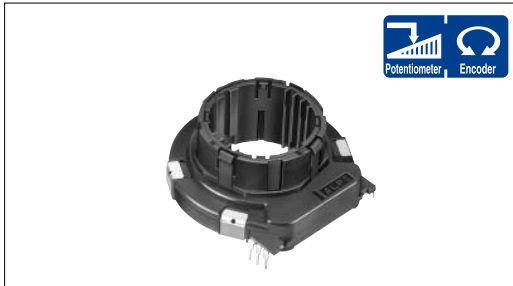
Hollow Shaft Type Devices 45mm Size Encoder/Potentiometer

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	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


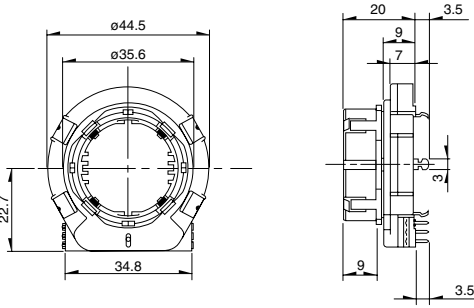
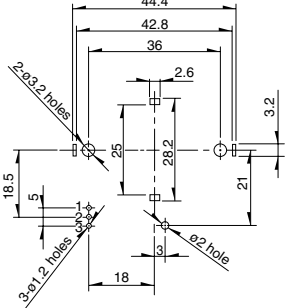
Unit:mm

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

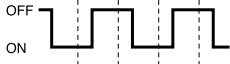
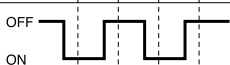
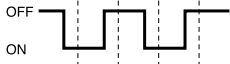
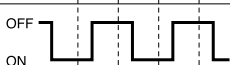
Hollow Shaft Type Devices

Dimensions

Unit:mm

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

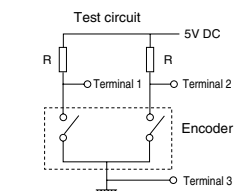
Output Wave (Incremental Type)

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

The dotted lines indicate detent positions

Sliding Noise (Incremental Type)

$V_1 = V_2 = 2.5V \text{ max.}$



Test circuit

5V DC

R

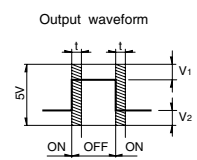
Terminal 1

Terminal 2

Encoder

Terminal 3

Measurement condition : Rotation speed 360°/s



Output waveform

5V

ON

OFF

ON

V_1

V_2

t : Masking time to avoid chattering

At R = 10k
 Chattering : 3ms max.
 Bounce : 2ms max.

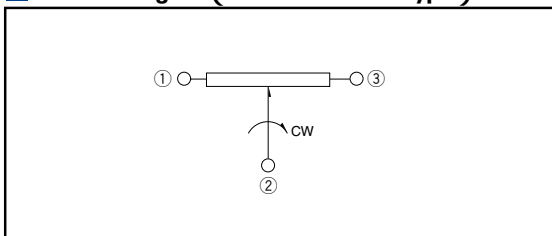
Encoder Type
 Potentiometer Type

Standard Codes (Absolute Type)

Code	Terminal	Number of positions																																	
		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

Hollow Shaft
Type Devices

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	Incremental		
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	100M min. 250V DC				10M min. 50V DC		10M 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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Encoder
Type

Potentiometer
Type

Self-return Switch Specifications

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