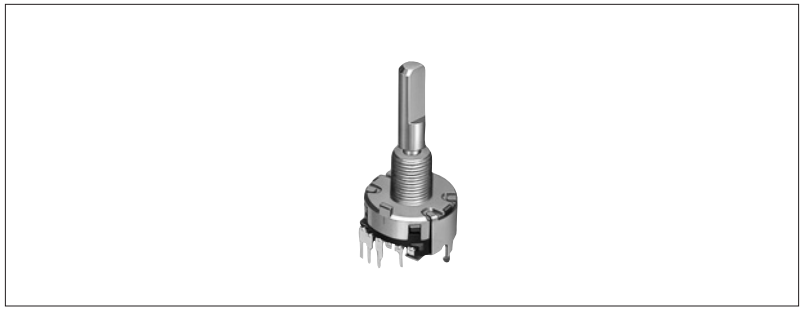
20mm Size Metal Shaft Encoder / Potentiometer

EC20A / RK203 Series

Has heavy rotation torque, a comfortable operation feel, and can be used as an encoder or potentiometer.



Car Use

Features

- Good operational feel.
- A round shape and low profile are suitable for design with illumination.
- With push switch type. (1.5mm travel)
- Incremental type.
- Fully compatible with an encoder or a potentiometer.

Applications

- Car air conditioner controls such as temperature, fan and mode controls. Controls for various electrical appliances
- For controllers for audio equipment, such as automobile AV equipment, etc.

Typical Specifications

Items	Specifications
Rating	0.5mA 5V DC
Operating life	30,000 cycles

Products Line

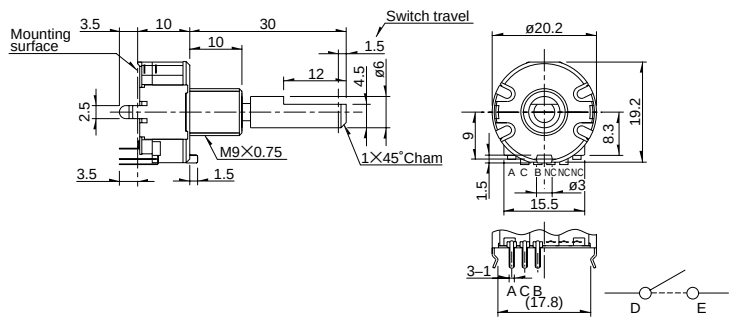
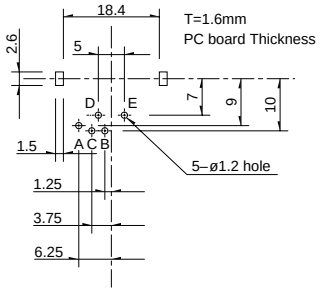
Operating section	Length of operating section (mm)	Detent torque	Number of detent	Resolution	Operating direction	Travel of push-on switch (mm)	Minimum packing unit (pcs.)	Products No.
Flat	30	40±20mN·m	18	18	Vertical	1.5	400	EC20A1824401

Notes

1. Ask us for models without a push switch.
2. Ask us for potentiometer types and absolute encoder types.

Dimensions

Unit : mm

Style	PC board mounting hole dimensions (Viewd from mounting face)
	

Products Specifications

Items			Standard type EC11B		Low-profile type EC11E		Low-profile type EC111	20mm size EC20A
			Standard type	Double torque type	Standard type	Reflow type	Self-return switch	
Operating temperature range			–30 to +85℃					–30 to +80℃
Maximum operating current (Resistive load)			10mA					0.5mA
Electrical performance	Rating		10mA 5V DC					0.5mA 5V DC
	Output signal		Output of A and B signals, proportionate to phase difference				Self-return switch	Output of A and B signals, proportionate to phase difference
	Insulation resistance		250V DC 100MΩ min.					50V DC 10MΩ min.
	Voltage proof		300V AC					50V AC
Mechanical performance	Rotational torque		—				3 to 30mN·m	—
	Detent torque		12±7mN·m	16±7mN·m	10±7mN·m	6±4mN·m	—	40±20mN·m
	Push-pull strength		100N					
	Resistance to soldering heat	Manual soldering	300℃ or less, or within 3s					
		Dip soldering	260±5℃, 5±1s			—	260±5℃, 5±1s	
		Reflow soldering	—			Please see P.190	—	
Durability	Rotational life		15,000 cycles					30,000 cycles
Environmental performance	Cold		–40±3℃ for 240h					
	Dry heat		85±3℃ for 240h					
	Damp heat		60±2℃, 90 to 95%RH for 240h					

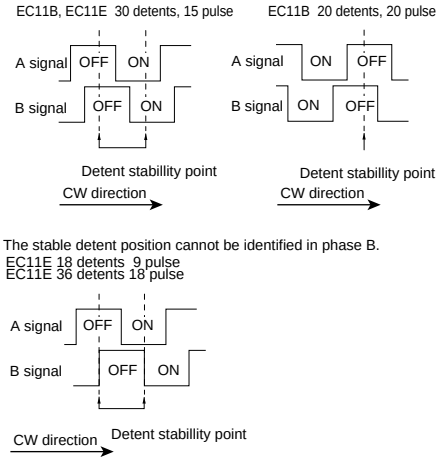
Push-on Switch Specifications

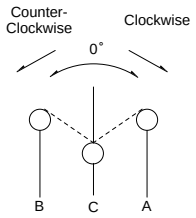
Items	Standard type EC11B		Low-profile type EC11E / EC111		20mm size EC20A
Switch circuit・the number of contact	Single pole and single throw (Push-on)				
Travel of switch	$0.5^{+0.4}_{-0.3}$mm	1.5±0.5mm	0.5±0.3mm	1.5±0.5mm	
Operating force of switch	6±3N	5±2N	$6^{+2.5}_{-2}$N	4±2N	
Rating	DC 16V 3A (10mA 16V DC min ratings)		DC 16V 0.5A (1mA 16V DC min ratings)		
Contact resistance	100m Ω for initial period; 200mΩ after rotational life				
Operating life	25,000 times min.	20,000 times min.			

Products Specifications

Output Wave

Standard type EC11B		Low-profile type EC11E		Low-profile type EC111	20mm size EC20A
Standard type	Heavy torque type	Standard type	Reflow type	Self-return switch	



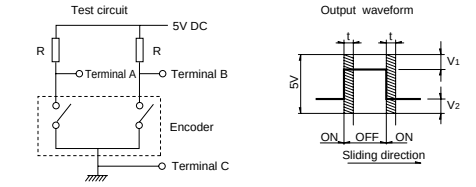


Shaft rotational Direction	Signal	Output
Clockwise	A (Terminal A–C)	OFF ON
	B (Terminal B–C)	OFF ON
Counter-clockwise	A (Terminal A–C)	OFF ON
	B (Terminal B–C)	OFF ON
		The broken line shows Detent stability position

Sliding Noise

Standard type EC11B		Low-profile type EC11E		Low-profile type EC111	20mm size EC20A
Standard type	Heavy torque type	Standard type	Reflow type	Self-return switch	

V1=V2=1.5V max.



Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering

At R = 5kΩ Chattering :2ms max. Bounce :2ms max.	At R = 5kΩ Chattering :3ms max. Bounce :2ms max.	At R = 5kΩ Chattering :8ms max. Bounce :5ms max.