

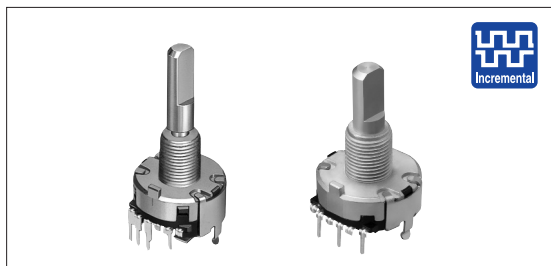
Encoder 20mm Size Metal Shaft Type

EC20A/RK203 Series



Heavy torque and comfortable operation feel for encoder and potentiometer applications.

Detector
Push
Slide
Rotary
Encoders



Typical Specifications

Items	Specifications	
	Encoder	Potentiometer
Rating	1mA 5V DC	0.05W
Operating life	30,000cycles	
Operating temperature range	-40°C to +85°C	

Power
Dual-in-line Package Type
TACT Switch™
Custom-Products

Product Line

Encoders

Operating section	Length of operating section (mm)	Detent torque (mN·m)	Number of detent	Number of pulse	Operating direction	Travel of push-on switch (mm)	Minimum order unit (pcs.)	Product No.	Drawing No.
Flat	30	40±20	18	18	Vertical	1.5	800	EC20A1824401	1
						—		EC20A1820401	2

Potentiometer

Operating section	Length of operating section (mm)	Detent torque (mN·m)	Number of positions	Rotational angle	Operating direction	Minimum order unit (pcs.)	Product No.	Drawing No.
Flat	30	40±20	17	220°	Vertical	800	RK203111000V	3

Metal Shaft
Insulated Shaft
Hollow Shaft
Ring Type

Packing Specifications

Tray

Number of packages (pcs.)		Export package measurements (mm)
1 case /Japan	1 case /export packing	
400	800	374×508×272

Notes

1. For with switch type, only the incremental type is available.
2. Please place purchase orders per minimum order unit N (integer).

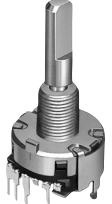
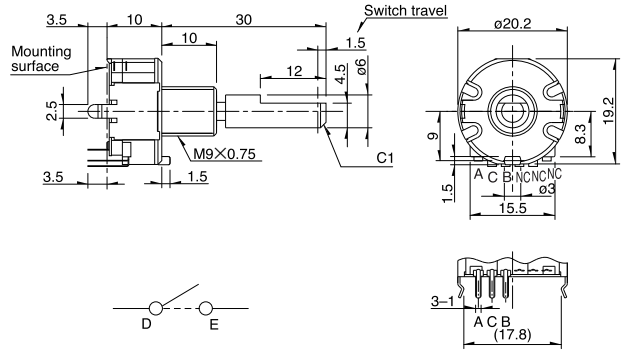
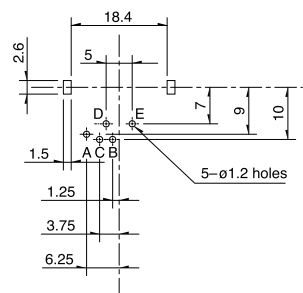

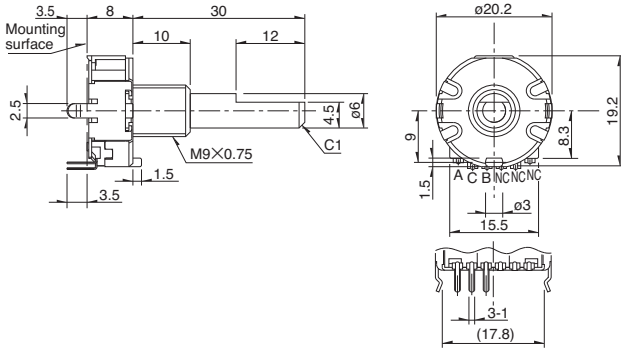
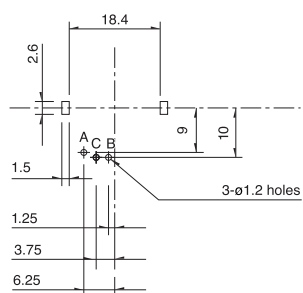

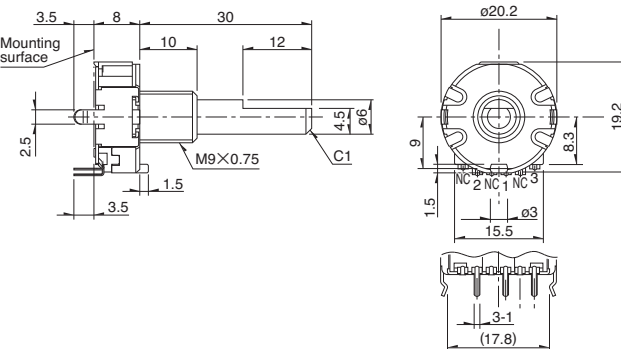
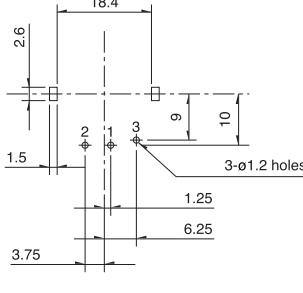


Automotive Use

Refer to P.217 for product specifications.

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (View from mounting face)
1	<p>EC20A with push-on switch (travel 1.5mm) Incremental Type</p> 		
2	<p>EC20A without switch type Incremental Type</p> 		
3	<p>RK203 without switch type Potentiometer Type</p> 		

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Custom-
Products

**Metal
Shaft**

Insulated
Shaft

Hollow
Shaft

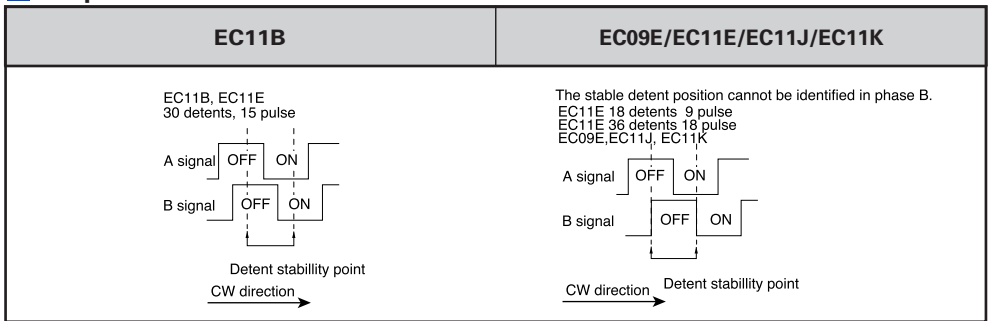
Ring
Type



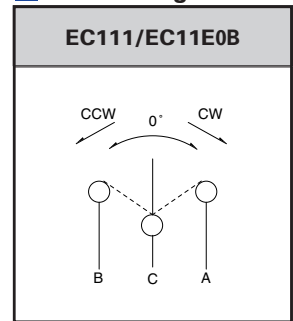
Automotive
Use

Product Specifications

Output Wave



Circuit Diagram



Detector
Push
Slide
Rotary

Encoders

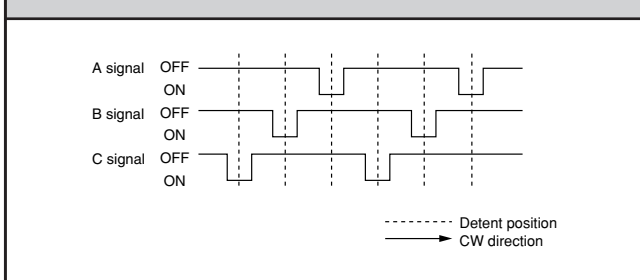
Power

Dual-in-line
Package Type

TACT Switch™

Custom-
Products

EC11EH



EC20A

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 dotted lines indicate detent positions

Metal
Shaft

Insulated
Shaft

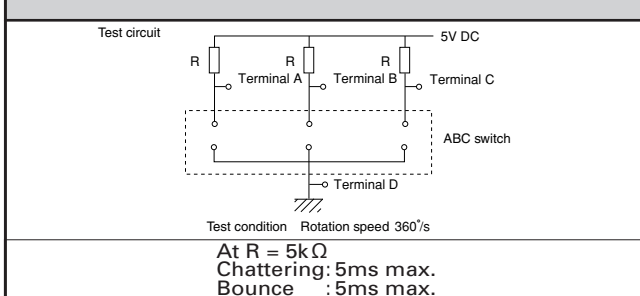
Hollow
Shaft

Ring
Type

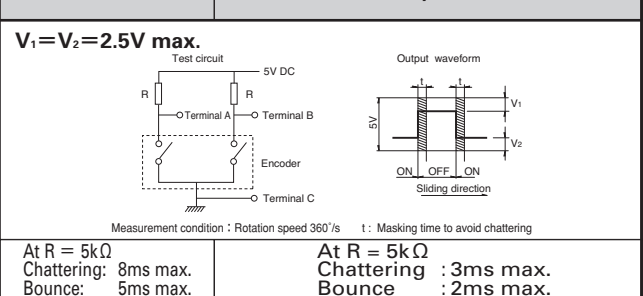
Sliding Noise

EC09E	EC11B	EC11E
<p>$V_1 = V_2 = 1.5V$ max.</p> <p>Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering</p>		
<p>At R = 5kΩ Chattering: 5ms max. Bounce: 2ms max.</p>	<p>At R = 5kΩ Chattering: 2ms max. Bounce : 2ms max.</p>	<p>At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.</p>

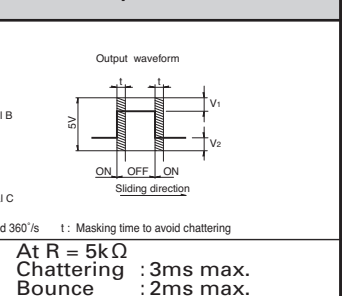
EC11EH



EC20A



EC11J/EC11K

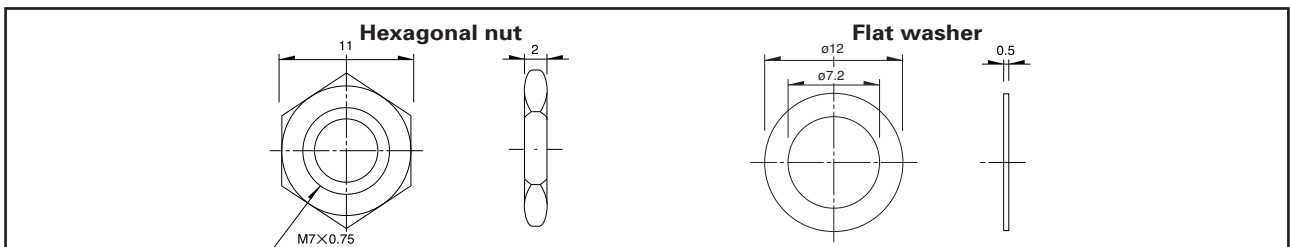


Automotive
Use





Attached Parts

EC11B Series

Unit:mm



List of Varieties

Type	Metal shaft				
	11mm size		20mm size		
Series	EC11K	EC11J	EC20A/RK203	EM20B	
Photo					
Output	Incremental				
Outline specifications	Shaft types	Single-shaft			
	Operating direction	Vertical			
	Number of pulse/ Number of detent	9/18 15/30		18/18 40/40	
	Push switch (Travel mm)	Without With (0.5, 1.5)		Without With (0.5)	
	Optional function	Display function			
Dimensions (mm)	W	11.7		20	
	D	12	14.2	19.2 22.25	
	H	4.5		10 13	
Soldering	Manual soldering	350°C max. 3s max.			
	Dip soldering	260±5°C, 3±1s	—	260±5°C, 5±1s 260°C max. 3s max.	
	Reflow soldering	—	Please see P.212	—	
Operating temperature range	-40°C to +85°C			-10°C to +70°C	
Automotive use	○	○	○	—	
Maximum operating current (Resistive load)	10mA			—	
Electrical performance	Output signal	Output of A and B signals, proportionate to phase difference			V _H : +4.0V min. V _{LO} : 0.5V max. (Isink=5mA)
	Output wave	Please see P.217			—
	Output phase	—			A, B (Squarewave)
	Sliding noise	Please see P.217			—
	Insulation resistance	100MΩ min. 250V DC		10MΩ min. 50V DC	100MΩ min. 250V DC
	Voltage proof	300V AC for 1minute		50V AC for 1minute	300V AC for 1minute
Mechanical performance	Rotational torque	—			7mN·m max.
	Detent torque	12±5mN·m		40±20mN·m	8±5mN·m
	Push-pull strength	100N			—
Environmental performance	Cold	-40±2°C for 240h		-40±3°C for 240h -30±3°C for 240h	
	Dry heat	85±2°C for 240h		85±3°C for 240h 80±3°C for 240h	
	Damp heat	60±2°C, 90 to 95% RH for 240h		60±3°C, 90 to 95%RH for 240h 40±2°C, 90 to 95%RH for 240h	
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Push-on Switch Specifications

Items	EC11K/EC11J	EC20A	EM20B
Contact arrangement	Single pole and single throw (Push-on)		
Travel (mm)	0.5±0.3	1.5±0.5	0.5 ^{+0.4} _{-0.3}
Operating force (N)	5±2	4±2	6±3
Rating	0.1A 5V DC		0.1A 5V DC
Contact resistance	100mΩ for initial period; 200mΩ after operating life		
Operating life	1,000,000 times min.	100,000 times min.	20,000times min. 25,000times min.

Note

○marks in "Available for automotive use" indicate that some of the series products can work at the operating temperature range from -40°C to +85°C.

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Custom-
ProductsMetal
ShaftInsulated
ShaftHollow
ShaftRing
Type