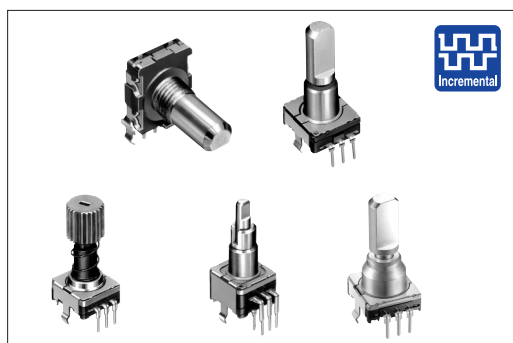


Encoder 11mm Size Metal Shaft Type

EC11 Series



Compact and highly reliable type available in many varieties.



Typical Specifications

Items	Specifications
Rating	10mA 5V DC
Operating life	15,000cycles EC11EH:30,000cycles EC11K:100,000cycles 500,000cycles 1,000,000cycles
Operating temperature range	−40°C to +85°C

Product Line

Structure	Actuator configuration	Actuator length (mm)	Torque (mN·m)	Number of detent	Number of pulse	Push-on switch	Travel of push-on switch (mm)	Operating life (cycles)	Minimum order unit (pcs.)	Product No.	Drawing No.					
Horizontal	Flat	20	12±7	30	15	Without	—		1,400	EC11B15202AA	1					
						With	0.5			EC11B15242AE	2					
							1.5			EC11B15242AF	3					
Vertical			10±7	18	9	Without	—	15,000	2,400	EC11E09204A4	4					
										30		15	EC11E15204A3			
				7 ⁺³ ₋₄	Without					EC11E1530401						
				10±7	36					EC11E1820402						
				7 ⁺³ ₋₄	Without					EC11E1830401						
				10±7	18					With		0.5	EC11E09244BS	5		
				30	9	EC11E15244G1										
				7 ⁺³ ₋₄	Without	EC11E153440D										
				10±7	36	EC11E18244AU										
				7 ⁺³ ₋₄	Without	EC11E183440C										
				10±7	18	1.5	EC11E09244AQ									
				30	9		EC11E15244B2									
				7 ⁺³ ₋₄	Without		EC11E1534408									
				10±7	36		EC11E18244A5									
				7 ⁺³ ₋₄	Without		EC11E1834403									
				12±5	18	9	Without			—	100,000	2,000	EC11K0920401	6		
													30		15	EC11K1520401
													18		9	EC11K0924401
			30				15	EC11K1524402								
			18				9	With	0.5	EC11K0925401						
			30				15			EC11K1525401						
			18		9	Without	—	500,000	EC11K0920601	6						
			30		15				EC11K1520601							
			18		9				With		0.5		EC11K0924601	7		
			30		15	EC11K1524601										
			18		9	1.5	EC11K0925601									
			30		15		EC11K1525601									
			18		9	Without	—	1,000,000	EC11K0920801	6						
			30		15				EC11K1520801							
			18		9				With		0.5		EC11K0924801	7		
	30	15	EC11K1524801													
	18	9	1.5	EC11K0925801												
	30	15		EC11K1525801												

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 Line

	Structure	Actuator configuration	Actuator length (mm)	Torque (mN·m)	Number of detent	Number of pulse	Push-on switch	Travel of push-on switch (mm)	Operating life (cycles)	Minimum order unit (pcs.)	Product No.	Drawing No.
Detector	Push lock	20-tooth serration	25	10±7	30	15	Without	—		1,600	EC11E152T409	8
			With				8	EC11E152U402			9	
Push	Self-return switch		15	3 to 30	Without	Self-return switch	Without	—	15,000		EC1110120005	10
Slide							0.5	1.5			EC111012010H	11
Rotary	ABC switch	Flat	20	10±7	18	ABC switch	With	0.5	30,000	2,400	EC11EH124403	12
Encoders					30						EC11EH224403	
					18						EC11EH124404	
Power					30			1.5			EC11EH224404	
Dual-in-line Package Type	Dual-shaft		Inner-shaft=25		30	15		0.5	15,000	1,400	EC11EBB24C03	13
TACT Switch™		Slotted	Outer-shaft=15				Without	—			EC11E0B2LB01	14
		Flat	Inner-shaft=25	With			1.5					
Custom-Products		Slotted	Outer-shaft=15	3 to 30	Without	Self-return switch	Without	—				

Packing Specifications

Tray

	Product No.	Number of packages (pcs.)		Export package measurements (mm)
		1 case /Japan	1 case /export packing	
Metal Shaft	EC11B	700	1,400	370×520×201
	EC11E09/15/18/EC11EH	1,200	2,400	540×360×250
	EC11K	1,000	2,000	
Insulated Shaft	EC11E152T/U	800	1,600	374×529×213
Hollow Shaft	EC111	1,200	2,400	363×507×216
Ring Type	EC11E0B/BB	700	1,400	374×529×213

Notes

- Products other than those listed in the above chart are also available. Please contact us for details.
- Please place purchase orders per minimum order unit N (integer).



Refer to **P.209** for product varieties.
Refer to **P.217** for product specifications.
Refer to **P.217** for attached parts.

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1	Horizontal 		
2	Horizontal with push-on switch (travel 0.5mm) 		
3	Horizontal with push-on switch (travel 1.5mm) 		
4	Vertical 		
5	Vertical with push-on switch (travel 0.5/1.5mm) 		

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Custom-
Products

Metal
Shaft

Insulated
Shaft

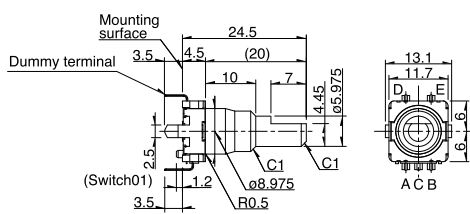
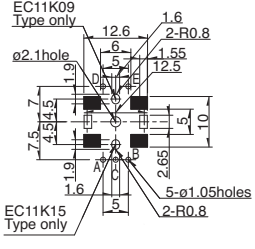
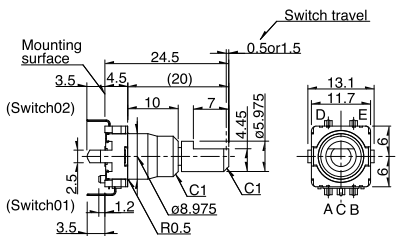
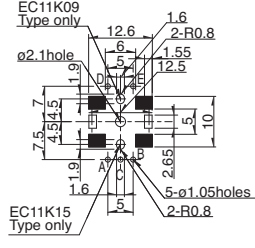
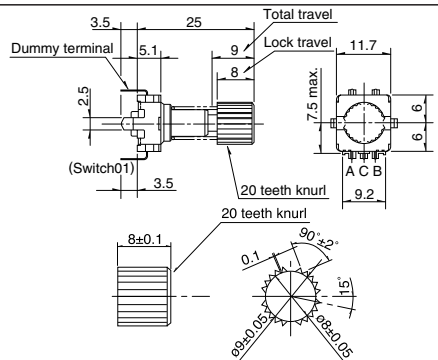
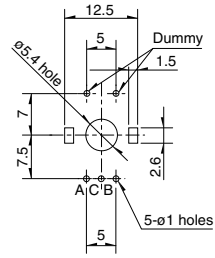
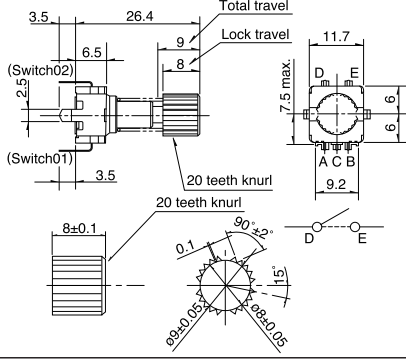
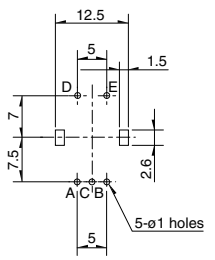
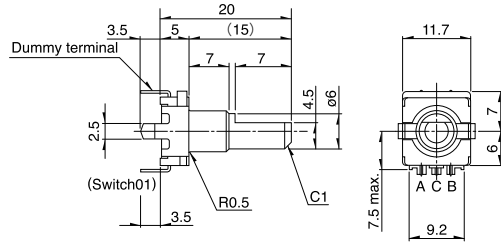
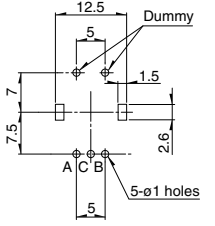
Hollow
Shaft

Ring
Type

Automotive
Use

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
6	Vertical 		 EC11K09 Type only EC11K15 Type only PC board mounting detail A slant line part shows the solder land black part: Do not solder and wiring for electrical contact
7	Vertical with push-on switch (travel 0.5mm/1.5mm) 		 EC11K09 Type only EC11K15 Type only PC board mounting detail A slant line part shows the solder land black part: Do not solder and wiring for electrical contact
8	Push-lock mechanism 		
9	Push-lock mechanism with push-lock switch 		
10	Self-return switch 		

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

TACT Switch™

Custom-
Products

Metal
Shaft

Insulated
Shaft

Hollow
Shaft

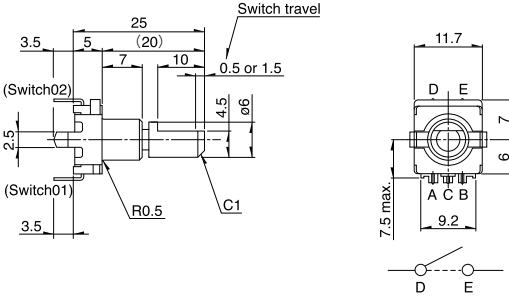
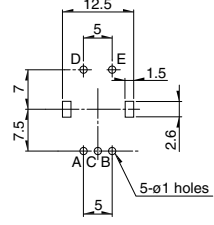
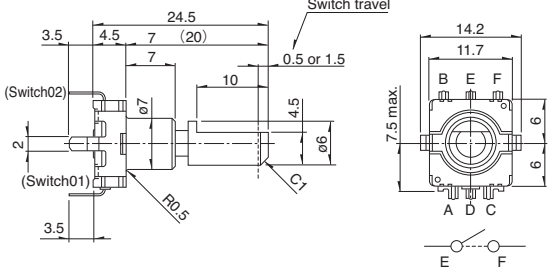
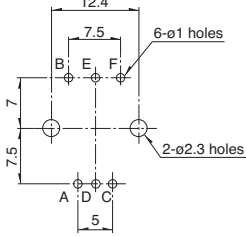
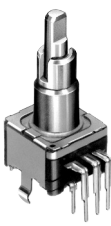
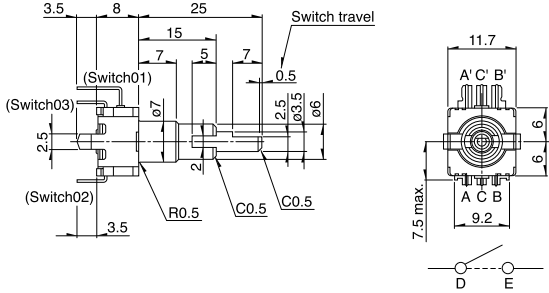
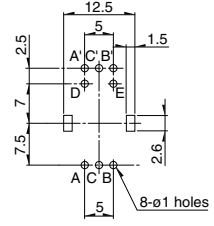
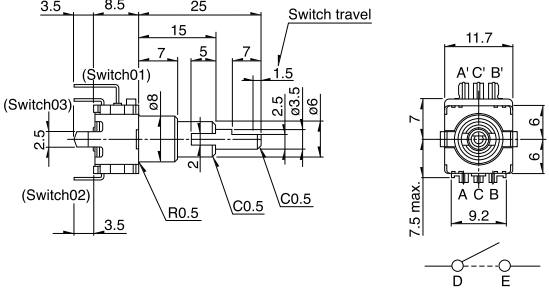
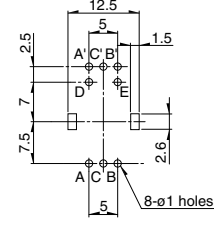
Ring
Type



Automotive
Use

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
11	Self-return switch with push-on switch (travel 0.5mm/1.5mm) 		
12	ABC switch with push-on switch (travel 0.5mm/1.5mm) 		
13	Dual-shaft type with push-on switch (travel 0.5mm) Inner shaft: encoder Outer shaft: encoder 		
14	Dual-shaft type with push-on switch (travel 1.5mm) Inner shaft: encoder Outer shaft: self-return switch 		

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 Varieties

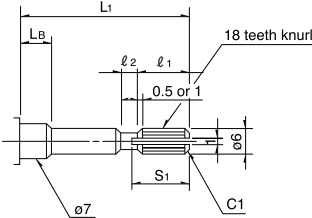
Shaft Dimensions

1. Single-shaft Type (EC11K is excluded. Refer to P.212 for EC11K)

1) Knurled Type Unit:mm

Configuration(Shaft diameter: $\phi 6$)

Not applicable for EC11E with push-lock mechanism

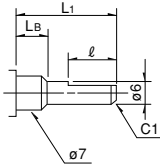


Detailed dimensions

L ₁	L _B	ℓ ₁	ℓ ₂	S ₁
20	7	6	1	7
25	10	10	2	11

2) Flat Type Unit:mm

Configuration(Shaft diameter: $\phi 6$)



Detailed dimensions

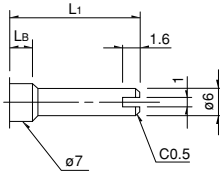
L ₁	L _B	ℓ
15	5	7
15	7	5 (6)
20	7	10 (12)
25	10	12

※Does not comply with EC111

Dimensions marked with () apply to products without push-on switches.

3) Slotted Type Unit:mm

Configuration(Shaft diameter: $\phi 6$)



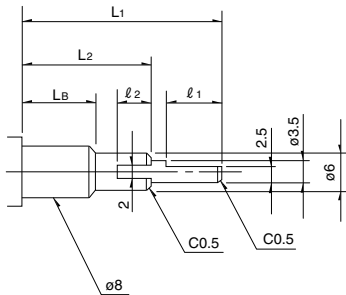
Detailed dimensions

L ₁	L _B
15	7
20	7
25	10

2. Standard Dimensions and configuration of Dual-shaft Type

1) Flat Type Unit:mm

Configuration(Inner-shaft : $\phi 3.5$ Outer-shaft : $\phi 6$)



Detailed dimensions

L ₁	L ₂	L _B	ℓ ₁	ℓ ₂
20	10	5	7	4
25	15	7	7	5
30	20	10	7	5

Notes

- The highlighted figures in shaft types refer to Product Specifications in P.204 and P.205.
- Products other than those listed in the above chart are also available. Please contact us for details

List of Varieties

	Type		Metal shaft								
			9mm size		11mm size						
	Series		EC09E	EC11B	EC11E		EC111	EC11EH			
Detector	Photo										
Push											
Slide	Output		Incremental				Self-return switch	ABC switch			
Rotary	Outline specifications	Shaft types	Single-shaft			Dual-shaft	Single-shaft				
		Operating direction	Vertical	Horizontal		Vertical					
Number of pulse/ Number of detent		15/30			9/18 15/30 18/36		_____		6×ABC/18 10×ABC/30		
Push switch (Travel mm)		Without/With (0.5, 1.5)									
Optional functions		_____			Push-lock mechanism Without detent		_____				
Changeover angle		_____					17 to 40°		_____		
Power	Dimensions (mm)	W	9.5	11.7							
		D		13.8		12		13		12	
		H	4.5	5.5		4.5	8.5	5		4.5	
Dual-in-line Package Type	Soldering	Manual soldering	350℃ max. 3s max.								
		Dip soldering	260±5℃, 3±1s		260±5℃, 5±1s						
TACT Switch™	Operating temperature range		-40℃ to +85℃								
Custom-Products	Automotive use		○	○	○		○		○		
	Maximum operating current (Resistive load)		10mA								
Metal Shaft	Electrical performance	Output signal	Output of A and B signals, proportionate to phase difference				Self-return switch		Three phase A, B and C		
		Output wave	Please see P.217								
		Sliding noise	Please see P.217								
		Insulation resistance	100MΩ min. 250V DC								
		Voltage proof	300V AC for 1minute								
Hollow Shaft	Mechanical performance	Rotational torque	_____			7 ⁺³ / ₋₄ mN·m	—	3~30mN·m		_____	
		Detent torque	8±5mN·m		12±7mN·m		10±7mN·m		_____		10±7mN·m
		Push-pull strength	100N								
Ring Type	Environmental performance	Cold	-40±3℃ for 240h								
		Dry heat	+85±3℃ for 240h								
		Damp heat	60±2℃, 90 to 95%RH for 240h								
	Page		203		204						

Push-on Switch Specifications

Items	EC09E		EC11B		EC11E		EC111		EC11EH	
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}	1.5±0.5	0.5±0.3	1.5±0.5 8±0.8※	0.5±0.3	1.5±0.5	0.5±0.3	1.5±0.5
Operating force (N)	6 ^{+ 2.5} _{- 2}	4±2	6±3	5±2	6 ^{+ 2.5} _{- 2}	4±2 8 max. ※	6 ^{+ 2.5} _{- 2}	4±2	6 ^{+ 2.5} _{- 2}	4±2
Rating	10mA 5V DC		0.1A 5V DC (500μA 5V DC min. ratings)		0.1A 5V DC (500μA 5V DC min. ratings) 0.5A 12V DC ※		0.1A 5V DC (500μA 5V DC min. ratings)			
Contact resistance	100mΩ max. for initial period; 200mΩ max. after operating life.									
Operating life	10,000times min.		25,000 times min.	20,000 times min.	20,000times min. 10,000times min.※		20,000times min.			

Notes

- ※marked specification is only applicable to EC11E152U402.
- 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.

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 (1.5)	Without With (0.5)
	Optional function				Display function
Dimensions (mm)	W	11.7		20.2	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
Page		204	210	213	215

Push-on Switch Specifications

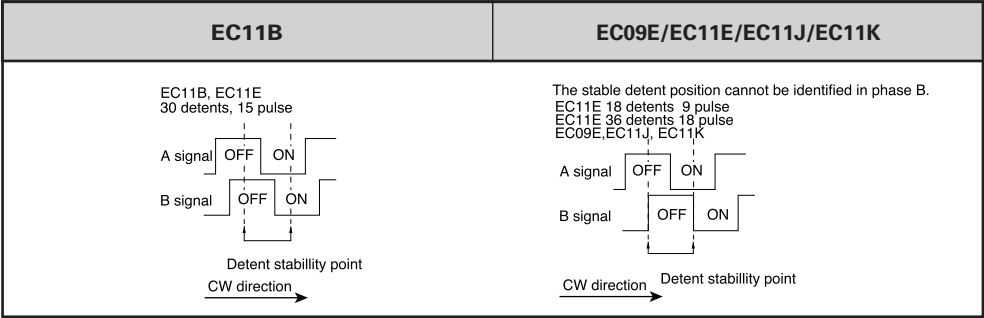
Items	EC11K/EC11J		EC20A	EM20B
Contact arrangement	Single pole and single throw (Push-on)			
Travel (mm)	0.5±0.3	1.5±0.5		0.5 ^{+0.4} _{-0.3}
Operating force (N)	5±2	4±2		6±3
Rating	0.1A 5V DC		0.5A 16V DC (1mA 16V DC min. ratings)	0.1A 5V DC
Contact resistance	100mΩ for initial period; 200mΩ after operating life			
Operating life	1,000,000 times min.	100,000 times min.	20,000times min.	25,000times min.

Note

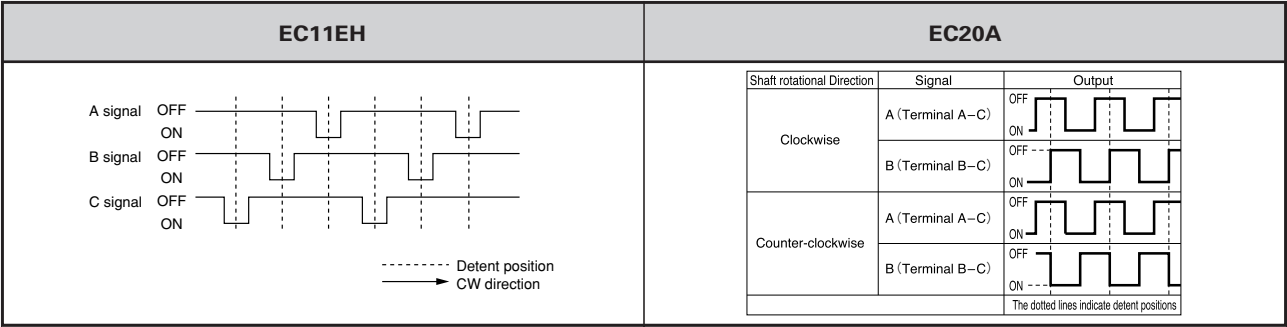
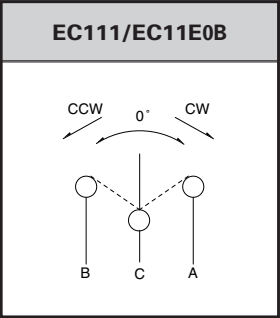
○marks in "Available for automotive use" indicate that some of the series products can work at the operating temperature range from -40°C to +85°C.

Product Specifications

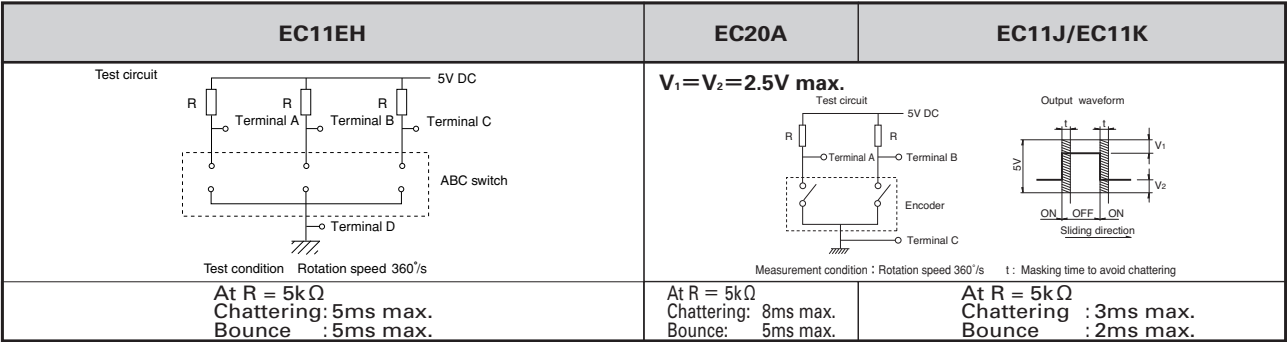
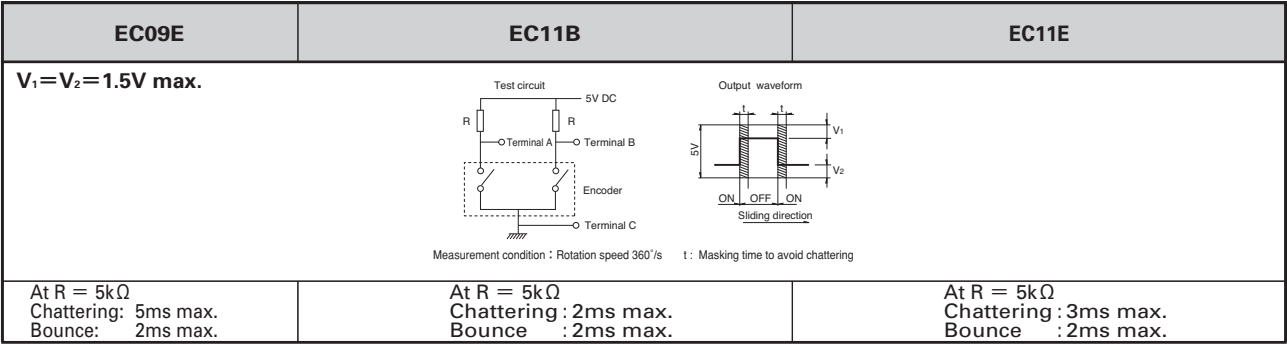
Output Wave



Circuit Diagram



Sliding Noise



Attached Parts

EC11B Series

Unit:mm

