

# Encoder 11mm Size Metal Shaft Long Life Type

EC11J/EC11K Series



Compact and highly reliable type available in many varieties.



### Typical Specifications

Items	Specifications
Rating	10mA 5V DC
Operating life	100,000cycles 500,000cycles 1,000,000cycles

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line  
Package Type

TACT Switch™

Custom-  
Products

Incremental  
Type

Absolute  
Type

### Product Line


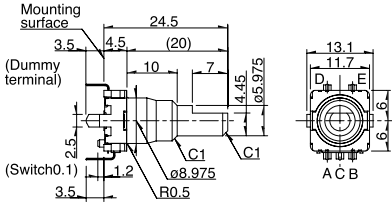
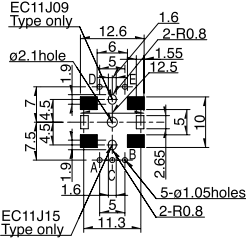

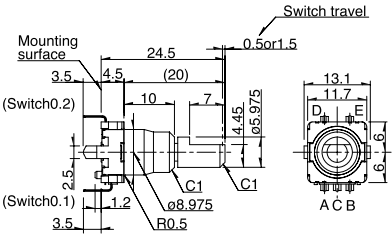
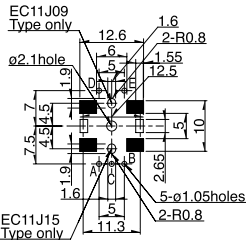

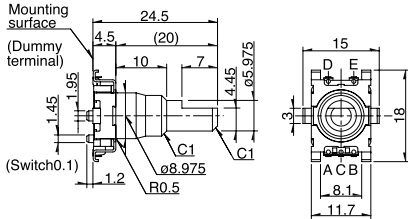
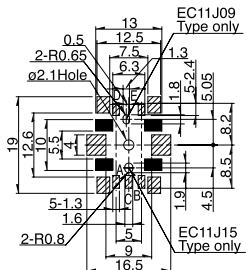

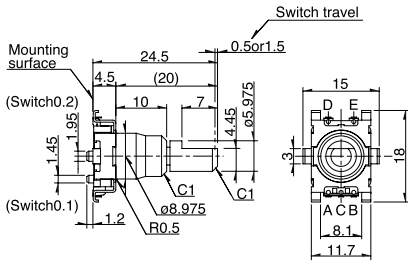
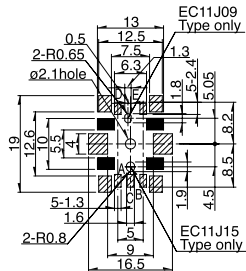
Structure	Actuator configuration	Actuator length (mm)	Torque (mN·m)	Number of detent	Number of pulse	Push-on switch	Travel of push-on switch (mm)	Operating life (cycles)	Minimum order unit (pcs.)	Product No.	Drawing No.
Vertical	Flat	20	12 ± 5	18	9	Without	—	100,000	1,000	EC11K0920401	1
				30	15					EC11K1520401	
				18	9	With	0.5			EC11K0924401	2
				30	15					EC11K1524402	
				18	9	1.5	EC11K0925401				
				30	15		EC11K1525401				
				18	9	Without	—	EC11K0920601	1		
				30	15			EC11K1520601			
				18	9	With	0.5	EC11K0924601	2		
				30	15			EC11K1524601			
				18	9	1.5	EC11K0925601				
				30	15		EC11K1525601				
				18	9	Without	—	EC11K0920801	1		
				30	15			EC11K1520801			
				18	9	With	0.5	EC11K0924801	2		
				30	15			EC11K1524801			
				18	9	1.5	EC11K0925801				
				30	15		EC11K1525801				
Reflow	Flat	20	12 ± 5	18	9	Without	—	100,000	300	EC11J0920402	3
				30	15					EC11J1520402	
				18	9	With	0.5			EC11J0924411	4
				30	15					EC11J1524413	
				18	9	1.5	EC11J0925403				
				30	15		EC11J1525402				
				18	9	Without	—	EC11J0920602	3		
				30	15			EC11J1520602			
				18	9	With	0.5	EC11J0924602	4		
				30	15			EC11J1524604			
				18	9	1.5	EC11J0925602				
				30	15		EC11J1525602				
				18	9	Without	—	EC11J0920802	3		
				30	15			EC11J1520803			
				18	9	With	0.5	EC11J0924802	4		
				30	15			EC11J1524802			
				18	9	1.5	EC11J0925802				
				30	15		EC11J1525802				

### Note

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

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1			 <p>PC board mounting detail                      A slant line part haws                      the solder land black part:                      Do not solder and wiring                      for electrical contact</p>
2			 <p>PC board mounting detail                      A slant line part haws                      the solder land black part:                      Do not solder and wiring                      for electrical contact</p>
3			 <p>PC board mounting detail                      A slant line part haws                      the solder land black part:                      Do not solder and wiring                      for electrical contact</p>
4			 <p>PC board mounting detail                      A slant line part haws                      the solder land black part:                      Do not solder and wiring                      for electrical contact</p>

## Product Varieties

### Shaft Dimensions

#### 1. Single-shaft Type

##### 1) Knurled Type

Unit:mm

Configuration ( Shaft diameter : 5.975 )

L <sub>1</sub>	L <sub>B</sub>	l <sub>1</sub>	S <sub>1</sub>
15	5	6	7
20	7	6	7

##### 2) Flat Type

Unit:mm

Configuration ( Shaft diameter : 5.975 )

L <sub>1</sub>	L <sub>B</sub>	l
15	7	5
20	10	7

##### 3) Slotted Type

Unit:mm

Configuration ( Shaft diameter : 5.975 )

L <sub>1</sub>	L <sub>B</sub>
15	7
20	10

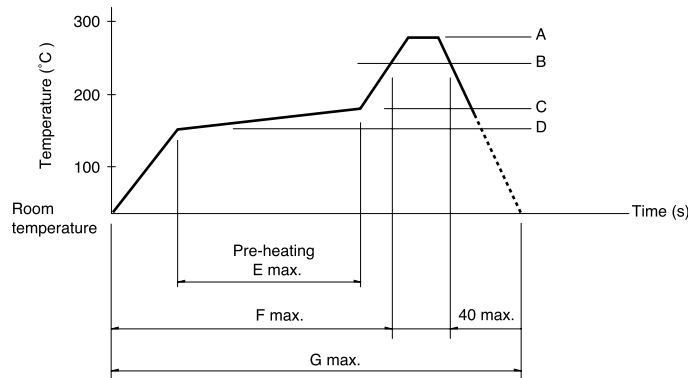
### Notes

- The highlighted figures in shaft types refer to Product Specifications in P.187.
- Products other than those listed in the above chart are also available. Please contact us for details

## Soldering Conditions

### Example of Reflow Soldering Condition

- Heating method: Double heating method with infrared heater.
- Temperature measurement: Thermocouple 0.1 to 0.2 CA ( K ) or CC ( T ) at soldering portion( copper foil surface ). A heat resisting tape should be used for fixed measurement.
- Temperature profile








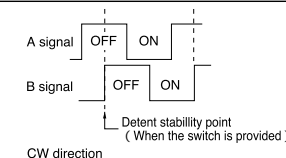
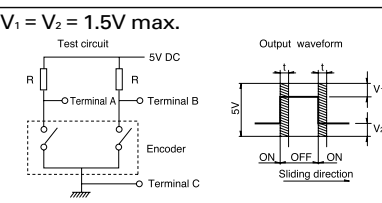


Series( Reflow type )	A( ) 3s max.	B( )	C( )	D( )	E( s )	F( s )	G( s )
EC11J	260	230	180	150	120	—	240

### Notes

- The condition mentioned above is the temperature on the mounting surface of a PC board. There are cases where the PC board's temperature greatly differs from that of the switch, depending on the PC board's material, size, thickness, etc. The above-stated conditions shall also apply to switch surface temperatures.
- Soldering conditions differ depending on reflow soldering machines. You are requested to verify the soldering conditions thoroughly beforehand.

# List of Varieties

Type	Metal shaft					Insulated shaft			
	11mm size			20mm size	12mm size				
Series	EC11G	EC11J	EC11K	EC20A/RK203	EC12E Standard detent	EC12D Without detent	EC12D With push-on switch		
Photo									
Output	Incremental								
Outline specifications	Shaft types	Single-shaft							
	Operating direction	Vertical							
	Number of pulse/ Number of detent	15/30	9/18 15/30		18/18	12/12 24/24	15/30		
	Push switch (Travel mm)	Without With( 1.5 )	Without With( 0.5, 1.5 )		Without With( 1.5 )	Without	With( 0.5 )		
	Optional functions	_____							
	Changeover angle	_____							
Dimensions (mm)	W	11.7			2.0	12.4	12.5		
	D	12	14.2		19.2	13.2	11.7		
	H	4.5			10	5			
Soldering	Manual soldering	350 max. 3s max.							
	Dip soldering	260 ± 5 , 5 ± 1s	_____	260 ± 5 , 5 ± 1s		260 ± 5 , 3 ± 1s			
	Reflow soldering	_____	Please see P.189						
Operating temperature range	-30 to +85	-40 to +85		-30 to +80	-10 to +70	-40 to +85			
Maximum operating current( Resistive load)	10mA			1mA	5mA	10mA			
Electrical performance	Output signal	Output of A and B signals, proportionate to phase difference							
	Output wave	Please see P.191							
	Sliding noise	Please see P.191				<p><math>V_1 = V_2 = 1.5V</math> max.</p>  <p>Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering</p> <p>At R = 10k Chattering : 3ms max. Bounce : 2ms max. At R = 5k Chattering : 3ms max. Bounce : 2ms max.</p>			
	Insulation resistance	100M min. 250V DC			10M min. 50V DC		100M min. 250V DC		
	Voltage proof	300V AC for 1minute			50V AC for 1minute		300V AC for 1minute or 360V AC for 1s.		
Mechanical performance	Rotational torque	$7 \pm \frac{3}{4} mN \cdot m$		_____		$10 mN \cdot m$ max. $25 \pm 15 mN \cdot m$ $40 \pm 15 mN \cdot m$			
	Detent torque	$10 \pm 7 mN \cdot m$		$12 \pm 5 mN \cdot m$		$40 \pm 20 mN \cdot m$			
	Push-pull strength	100N			80N		100N		
Environmental performance	Cold	-40 ± 3 for 240h			-40 ± 3 for 240h ± 10h				
	Dry heat	85 ± 3 for 240h			85 ± 3 for 240h ± 10h				
	Damp heat	60 ± 2 , 90 to 95% RH for 240h			60 ± 2 , 90 to 95%RH for 240h ± 10h				
Push-on Switch Specifications	Circuit · number of contacts	Single pole and single throw ( Push-on )					Single pole and single throw ( Push-on )		
	Travel(mm)	$0.5 \pm 0.3$	$1.5 \pm 0.5$	$0.5 \pm 0.3$	$1.5 \pm 0.5$	$0.5 \pm 0.3$	$0.5 \pm 0.3$		
	Operating force(N)	$6 \pm \frac{2}{5}$	$4 \pm 2$	$5 \pm 2$	$4 \pm 2$	$5 \pm 2$	$3 \pm \frac{1.5}{1.0}$   $6 \pm \frac{2.5}{2}$		
	Rating	0.5A 16V DC (1mA 16V DC min. ratings)		0.1A 5V DC		0.5A 16V DC (1mA 16V DC min. ratings)		1mA 5V DC	
	Contact esistance	100m for initial period; 200m after operating life					100m for initial period; 200m after operating life		
	Operating life	20,000times min.	1,000,000 times min.	500,000 times min.	1,000,000 times min.	100,000 times min.	20,000times min.		
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- Detector
- Push
- Slide
- Rotary
- Encoders
- Power
- Dual-in-line Package Type
- TACT Switch™
- Custom-Products

- Incremental Type
- Absolute Type