

# 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							


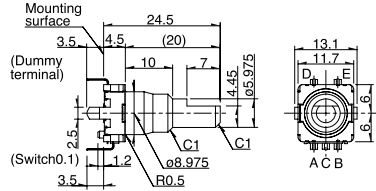
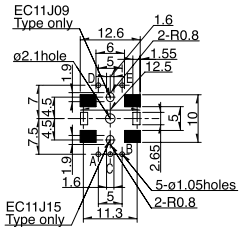

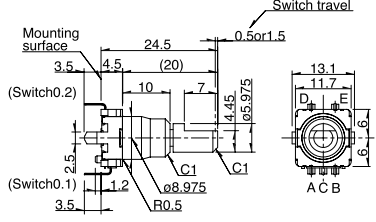
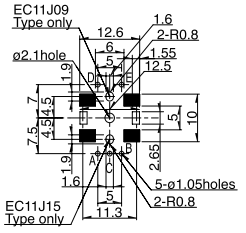

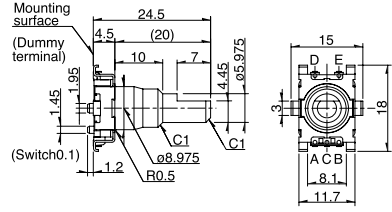
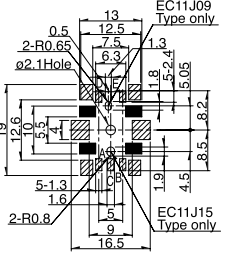

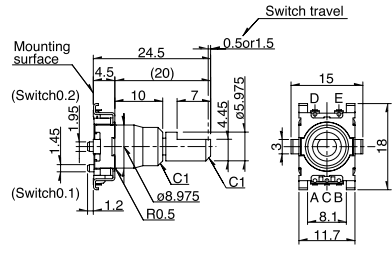
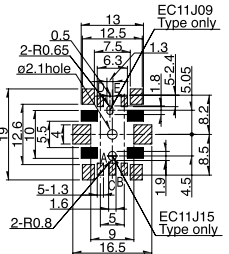
### Note

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

**Dimensions**

Unit:mm

- Detector
- Push
- Slide
- Rotary
- Encoders
- Power
- Dual-in-line Package Type
- TACT Switch™
- Custom-Products
- Incremental Type
- Absolute Type

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1			 <p>EC11J09 Type only</p> <p>EC11J15 Type only</p> <p>PC board mounting detail                      A slant line part shows the solder land black part:                      Do not solder and wiring for electrical contact</p>
2	<b>Vertical with push-on switch (travel 0.5mm/1.5mm)</b> 		 <p>EC11J09 Type only</p> <p>EC11J15 Type only</p> <p>PC board mounting detail                      A slant line part shows the solder land black part:                      Do not solder and wiring for electrical contact</p>
3	<b>Reflow applicable parts</b> 		 <p>EC11J09 Type only</p> <p>EC11J15 Type only</p> <p>PC board mounting detail                      A slant line part shows the solder land black part:                      Do not solder and wiring for electrical contact</p>
4	<b>Reflow applicable parts with push-on switch (travel 0.5mm/1.5mm)</b> 		 <p>EC11J09 Type only</p> <p>EC11J15 Type only</p> <p>PC board mounting detail                      A slant line part shows the solder land black part:                      Do not solder and wiring for electrical contact</p>

## Product Varieties

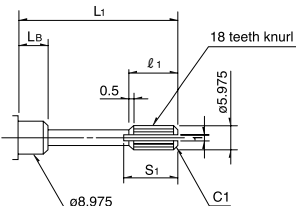
### Shaft Dimensions

#### 1. Single-shaft Type

##### 1) Knurled Type

Unit:mm

Configuration ( Shaft diameter : 5.975 )

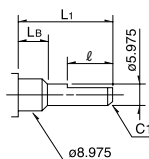


L <sub>1</sub>	L <sub>B</sub>	l <sub>1</sub>	S <sub>1</sub>
15	5	6	7
20	7	6	7

##### 2) Flat Type

Unit:mm

Configuration ( Shaft diameter : 5.975 )

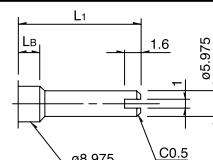


L <sub>1</sub>	L <sub>B</sub>	l
15	7	5
20	10	7

##### 3) Slotted Type

Unit:mm

Configuration ( Shaft diameter : 5.975 )



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

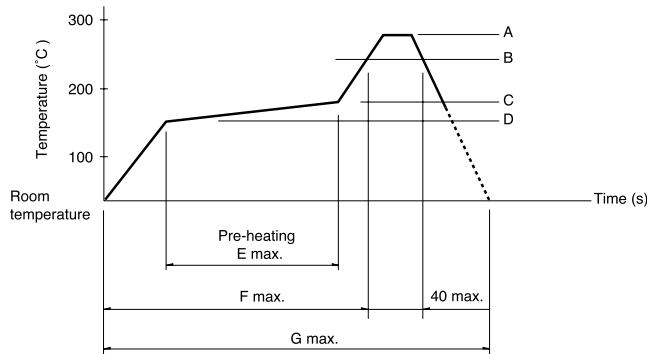
### Notes

- 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







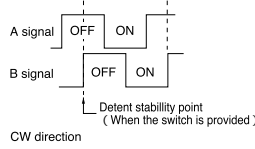
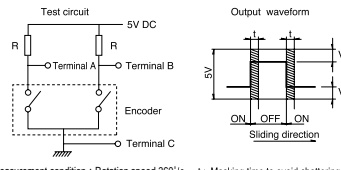
### Notes

- 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.

Detector  
Push  
Slide  
Rotary  
Encoders  
Power  
Dual-in-line  
Package Type  
TACT Switch™  
Custom-  
Products

Incremental  
Type  
Absolute  
Type

# List of Varieties

Type	Metal shaft				Insulated shaft			
	11mm size			20mm size	12mm size			
	EC11G	EC11J	EC11K	EC20A/RK203	EC12E Standard detent / 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 1 : 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	$7 \pm \frac{3}{4} \text{ mN}\cdot\text{m}$				10mN·m max. 25 ± 15mN·m 40 ± 15mN·m	
Detent torque		$10 \pm 7 \text{ mN}\cdot\text{m}$		$12 \pm 5 \text{ mN}\cdot\text{m}$	$40 \pm 20 \text{ mN}\cdot\text{m}$	$3 \pm 2 \text{ mN}\cdot\text{m}$ 3 to 20mN·m	$5 \pm 3 \text{ mN}\cdot\text{m}$ $10 \pm 5 \text{ mN}\cdot\text{m}$	
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 ± 0.3	1.5 ± 0.5	0.5 ± 0.3	1.5 ± 0.5	0.5 ± 0.3	0.5 ± 0.3	
	Operating force (N)	$6 \pm \frac{2.5}{2}$	4 ± 2	5 ± 2	4 ± 2	5 ± 2	4 ± 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.	30,000times min.
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Detector

Push

Slide

Rotary

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Package Type

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