

Encoder 11mm Size Metal Shaft Type

EC11 Series



Compact and highly reliable type available in many varieties.



Features

- Compact and highly accurate sliding contact type encoder.
- 1.5mm-travel push switch with compliance to 4.5mm height.
- Incremental type.
- Operation life 1,000,000cycles can be supported (EC11J).

Applications

- For controlling volume in car AV equipment, volume and menu selection in car navigation systems and various in-car components where less mounting surface is required
- For various types of controlling in DVD players/recorders, mini component stereos, CD players, portable audio players and various AV equipment
- For home appliances (microwave ovens)

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

Multi Control
Devices

TACT Switch™

Custom-
Products

Typical Specifications

Items	Specifications
Rating	10mA 5V DC
Operating life	15,000cycles EC11J:100,000cycles / 500,000cycles / 1,000,000cycles

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 packing unit (pcs.)	Product No.	Drawing No.
Horizontal			12±7	30	15	Without	—	15,000	700	EC11B15202AA	1
						With	0.5			EC11B15242AE	2
							1.5			EC11B15242AF	3
Vertical	Flat	20	10±7	18	9	Without	—	15,000	1,200	EC11E09204A4	4
				30						EC11E15204A3	
			7 ⁺³ / ₋₄	Without	15					EC11E1530401	
										EC11E1820402	
			10±7	36	18					EC11E1830401	
				7 ⁺³ / ₋₄						Without	
			10±7		18						
				30	EC11E153440D						
			7 ⁺³ / ₋₄	Without	15					EC11E18244AU	
										EC11E183440C	
			10±7	36	18					EC11E09244AQ	
				7 ⁺³ / ₋₄						Without	
			10±7		18						
				30	EC11E18244A5						
			7 ⁺³ / ₋₄	Without	15					EC11E1834403	
EC11E1834403											
10±7	36	18	EC11E1834403								
	7 ⁺³ / ₋₄		Without	15	EC11E1834403						
10±7		18			9	EC11E1834403					
	30	EC11E1834403									
7 ⁺³ / ₋₄	Without	15	EC11E1834403								
			EC11E1834403								

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 packing unit (pcs.)	Product No.	Drawing No.					
Detector	Less shaft wobble	20-tooth serration	18	10±7	30	15	With	1.5	15,000	1,200	EC11G1524402	6					
				7 ⁺³ ₋₄	Without						EC11G1534403						
Push	Reflow	Flat	20	12±5	18	9	Without	—	100,000	300	EC11J0920401	7					
Slide					30	15					EC11J1520401						
Rotary					With	18	9	0.5			8	EC11J0924401					
						30	15					EC11J1524401					
Encoders					With	18	9	1.5			8	EC11J0925401					
						30	15					EC11J1525401					
Power					Without	18	9	—			7	EC11J0920601					
						30	15					EC11J1520601					
Dual-in-line Package Type					With	18	9	0.5			8	EC11J924601					
						30	15					EC11J1524601					
Multi Control Devices					With	18	9	1.5			8	EC11J0925601					
						30	15					EC11J1525601					
TACT Switch™					Without	18	9	—			7	EC11J0920801					
						30	15					EC11J1520801					
Custom-Products					With	18	9	0.5			8	EC11J092481					
						30	15					EC11J1524801					
						18	9	1.5				EC11J0925801					
						30	15					EC11J1525801					
Push lock					20-tooth serration	25	10±7	30			15	Without	—	15,000	1,000	EC11E152T409	9
						26.4		With			8	800	EC11E152U402			10	
Self-return switch	Flat	20	3 to 30	Without	Self-return switch	Without	—	15,000	1,200	EC1110120001	11						
						With	0.5			12							
Dual-shaft	Flat	Inner-shaft=25	10±7	30	15	Without	0.5	15,000	1,200	EC111012010H	12						
		Outer-shaft=15					1.5			EC1110120201							
		Inner-shaft=25				700	With	0.5	EC11EBB24C03	13							
		Outer-shaft=15					Without	—	EC11E0B2LB01		14						
	Slotted	3 to 30	Without	Self-return switch	Without	—											

Note

Products other than those listed in the above chart are also available. Please contact us for details.

Refer to P.190 for product varieties.
Refer to P.194,195 for product specifications.
Refer to P.236 for attached parts.

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1			
2			
3			
4			
5			

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

Multi Control
Devices

TACT Switch™

**Custom-
Products**

**Incremental
Type**

**Absolute
Type**

Product Varieties

Shaft Dimensions

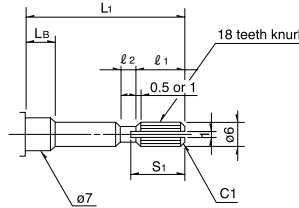
1. Single-shaft Type

1) Knurled Type

Unit:mm

Configuration (Shaft diameter : $\phi 6$)

Not applicable for EC11E and EC11G with push-lock mechanism



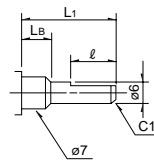
Detailed dimensions

L ₁	L _B	ℓ ₁	ℓ ₂	S ₁
20	7	6	1	7
25	7	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	7	12

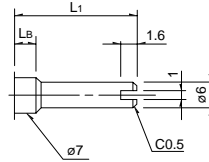
※Does not comply with EC111

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

3) Slotted Type

Unit:mm

Configuration (Shaft diameter : $\phi 6$)



Detailed dimensions

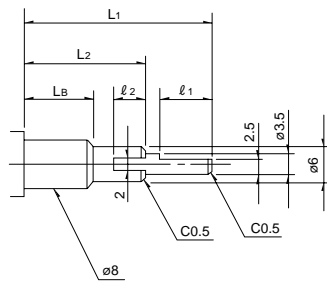
L ₁	L _B
15	7
20	7
25	7

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	7	7	5

Notes

- The highlighted figures in shaft types refer to Product Specifications in P.194 and P.195.
- Products other than those listed in the above chart are also available. Please contact us for details

Product Specifications

Items		EC11B	EC11E/EC11G	EC11J	EC111	EC20A
Detector	Operating temperature range	-30°C to +85°C		-40°C to +85°C	-30°C to +85°C	-30°C to +80°C
	Maximum operating current (Resistive load)	10mA				0.5mA
Push	Rating	10mA 5V DC				0.5mA 5V DC
Slide	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
Rotary	Insulation resistance	100MΩ min. 250V DC				10MΩ min. 50V DC
Encoders	Voltage proof	300V AC for 1minute				50V AC for 1min.
	Rotational torque (without click feeling)	—	7^{+3}_{-4} mN·m	—	3 to 30mN·m	—
Power	Detent torque	12 ± 7 mN·m	10 ± 7 mN·m	12 ± 5 mN·m	—	40 ± 20 mN·m
Dual-in-line Package Type	Push-pull strength	100N				
Multi Control Devices	Resistance to soldering heat	Manual soldering				350°C max. 3s max.
TACT Switch™		Dip soldering		—	260±5°C, 5±1s	
Custom-Products		Reflow soldering		Please see P.235		—
Incremental Type	Durability	Rotational life		15,000cycles	100,000cycles	15,000cycles 30,000cycles
	Absolute Type	Environmental performance	Cold			
Dry heat				85±3°C for 240h		
Damp heat				60±2°C, 90 to 95%RH for 240h		

Push-on Switch Specifications

Items	EC11B	EC11E/EC111/EC11G	EC11J	EC20A
Circuit · number of contacts	Single pole and single throw (Push-on)			
Travel (mm)	$0.5 \pm_{-0.3}^{+0.4}$	1.5 ± 0.5	0.5 ± 0.3	1.5 ± 0.5
Operating force (N)	6 ± 3	5 ± 2	$6 \pm_{-2}^{+2.5}$	4 ± 2
Rating	3A 16V DC (10mA 16V DC min. ratings)	0.5A 16V DC (1mA 16V DC min. ratings) 0.5A 12V DC ※	0.1A 5V DC	0.5A 16V DC (1mA 16V DC min. ratings)
Contact resistance	100mΩ for initial period; 200mΩ after rotational life			
Operating life	25,000 times min.	20,000times min. 10,000times min.※	1,000,000 times min.	100,000 times min. 20,000times min.

Note

※marked specification is only applicable to EC11E152U402.

Product Specifications

Output Wave

EC11B	EC11E/EC11G/EC11J	EC111	EC20A													
<p>EC11B, EC11E, EC11G 30 detents, 15 pulse</p> <p>The stable detent position cannot be identified in phase B.</p> <p>EC11E 18 detents 9 pulse EC11E 36 detents 18 pulse EC11J</p>			<table border="1"> <thead> <tr> <th>Shaft rotational Direction</th> <th>Signal</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Clockwise</td> <td>A (Terminal A-C)</td> <td>OFF ON</td> </tr> <tr> <td>B (Terminal B-C)</td> <td>OFF ON</td> </tr> <tr> <td rowspan="2">Counter-clockwise</td> <td>A (Terminal A-C)</td> <td>OFF ON</td> </tr> <tr> <td>B (Terminal B-C)</td> <td>OFF ON</td> </tr> </tbody> </table> <p>The dotted lines indicate detent positions</p>	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
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														

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

Multi Control
Devices

TACT Switch™

Custom-
Products

Sliding Noise

EC11B	EC11E/EC11G/EC11J	EC111	EC20A
<p>$V_1=V_2=1.5V$ max.</p> <p>Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering</p>		<p>—</p>	<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 : 2ms max. Bounce : 2ms max.</p>			<p>At R = 5kΩ Chattering : 8ms max. Bounce : 5ms max.</p>

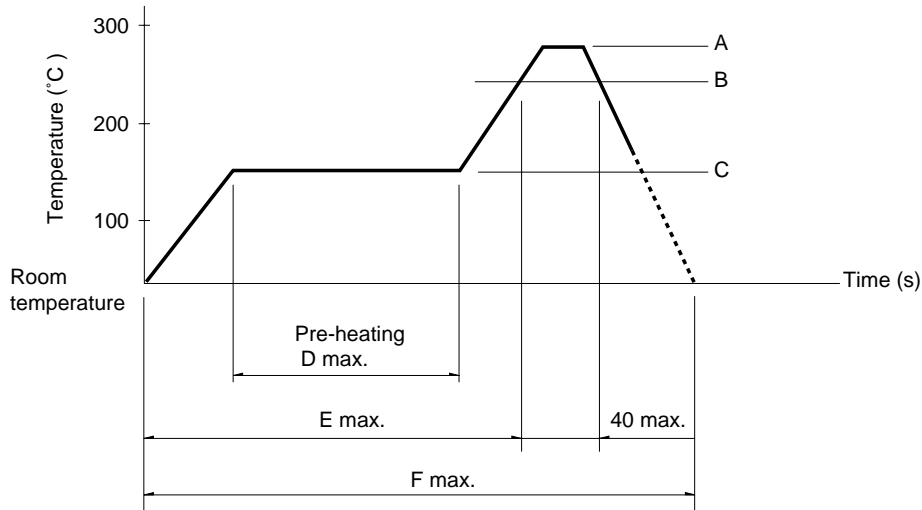
Incremental
Type

Absolute
Type

Soldering Conditions

Example of Reflow Soldering Condition

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



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

Notes

1. 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.
2. Soldering conditions differ depending on reflow soldering machines. Prior verification of soldering condition is highly recommended.

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

Multi Control
Devices

TACT Switch™

Custom-
Products

Incremental
Type

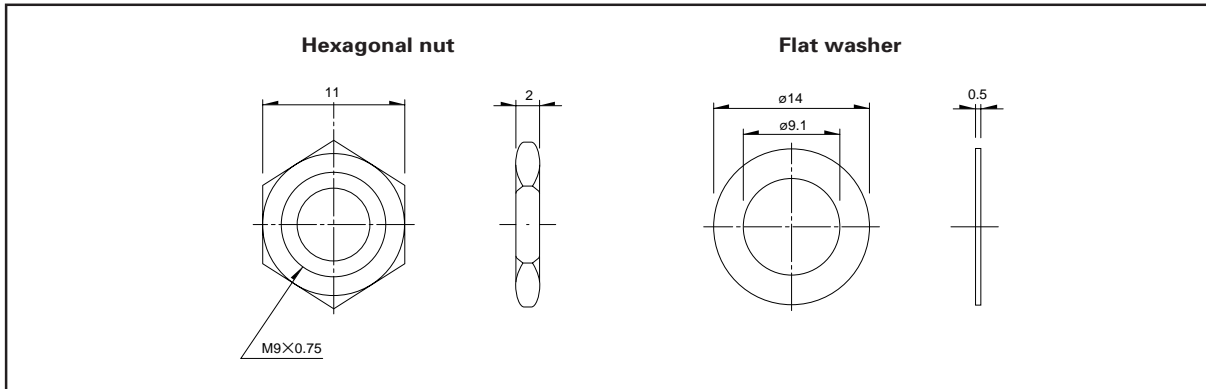
Absolute
Type

Attached Parts

The following parts are included with the product.

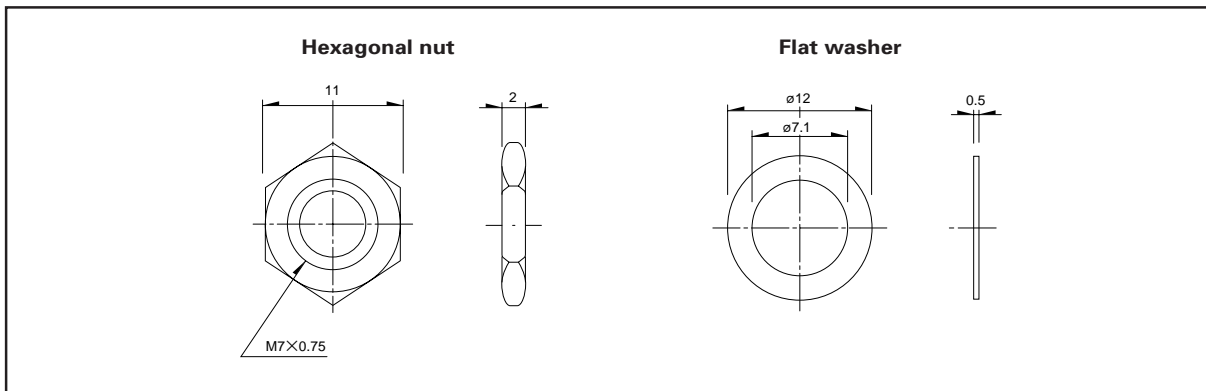
SRGH Series

Unit:mm



RK097, EC11B Series

Unit:mm



Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

Multi Control
Devices

TACT Switch™

Custom-
Products

Incremental
Type

**Absolute
Type**