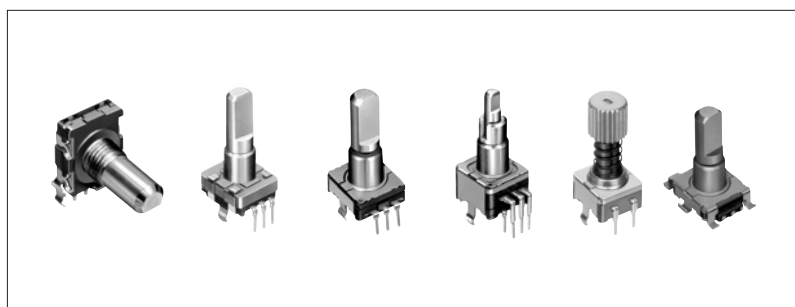


11mm Size Metal Shaft Type Encoder Variety

EC11 Series

Compact and highly reliable type available in many varieties.



Car Use

Features

- Compact and highly reliable, sliding contact type.
- 4.5mm-body height with a 1.5mm-travel push switch is available.
- Incremental type.

Applications

- Level controls for car audio and car navigation system. Various controls for devices in automotive
- Controls for image/sound devices, including DVD players, mini component stereos, CD players and portable audio players

Typical Specifications

Items	Specifications
Rating	10mA 5V DC
Operating life	15,000 cycles

Products Line

Style	Operating section	Length of operating section (mm)	torque	Number of detent	Resolution	Operating direction	Push-on switch	Travel of push-on switch (mm)	Minimum packing uni (pcs.)	Products No.	Drawing No.							
Standard			$12 \pm 7 \text{ mN} \cdot \text{m}$	30	15	Vertical	Without	—	1,000	EC11B15203AD	1							
				20	20					EC11B20203A3								
				30	15					EC11B15243BB								
				With	0.5		EC11B15243BC											
							20	20		EC11B2024304								
							30	15		EC11B15243BD								
			$16 \pm 7 \text{ mN} \cdot \text{m}$			30	15				700	EC11B15243BE	3					
												20		20	EC11B2024305			
												Horizontal		Without	—	EC11B15202AA		
																With	0.5	EC11B15242AE
																		1.5
												Low-profile		Flat	20	$10 \pm 7 \text{ mN} \cdot \text{m}$	18	9
30	15	EC11E15204A3																
Without	18	EC11E1530401																
36		EC11E1820402																
Without		EC11E1830401																
18	9	With	0.5	EC11E09244AW	8													
30	15			EC11E15244C0														
Without	18			EC11E153440D														
36				EC11E18244AE														
Without				EC11E1834404														
18	9			1.5		EC11E09244AQ												
30	15	EC11E15244B2																
Without	18	EC11E1534408																
36		EC11E18244A5																
Without		EC11E1834403																

Power

Push

Slide

Rotary

Encoders

Jog Shuttle

Telephone-hook

Detector

Vibration Sensors

Dual-in-line Package Type

Multi Control Devices

TACT

Incremental Type

Absolute Type


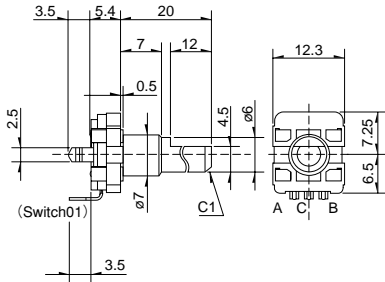
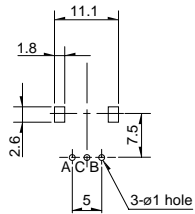

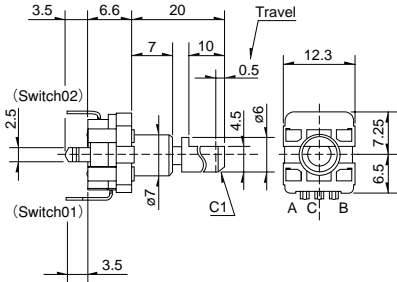
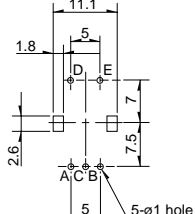
Products Line

Style	Operating section	Length of operating section (mm)	torque	Number of detent	Resolution	Operating direction	Push-on switch	Travel of push-on switch (mm)	Minimum packing unit (pcs.)	Products No.	Drawing No.
Power (Low-profile Reflow)	Flat	20	6±4 mN · m	30	15	Vertical	Without	—	1,600	EC11E1540503	9
							With	0.5		EC11E154450G	10
Push (Push lock)	20-tooth serration	25	10±7 mN · m	—	Self-return switch		Without	—	1,000	EC11E152T409	11
		26.4					With	8	800	EC11E152U402	12
Slide	Self-return	Flat	3 to 30 mN · m	—	Self-return switch		Without	—	1,200	EC1110120001	13
With							0.5	EC1110120103		14	
With							1.5	EC1110120201			
Rotary	Flat	Inner-shaft=25	10±7 mN · m	30	15		—	—	700	EC11EBB24C03	15
							With	1.5			
Encoders	Slotted	Outer-shaft=15	3 to 30 mN · m	—	Self-return switch		—	—	700	EC11E0B2LB01	16
Jog Shuttle	Flat	Inner-shaft=25									
Telephone-hook	Slotted	Outer-shaft=15	3 to 30 mN · m	—	Self-return switch		—	—	700	EC11E0B2LB01	16

Note


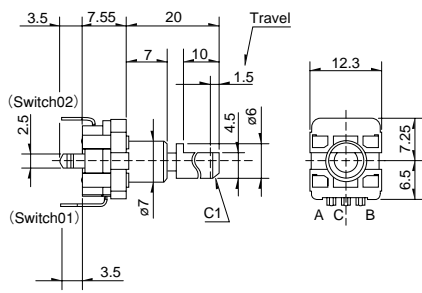
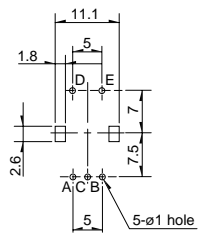
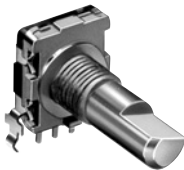
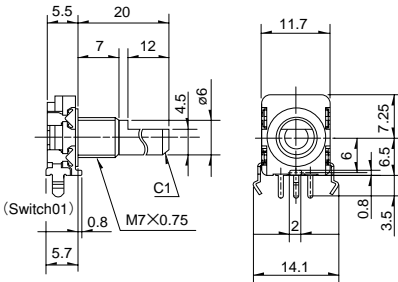
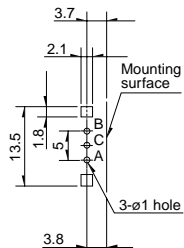
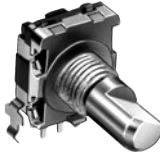
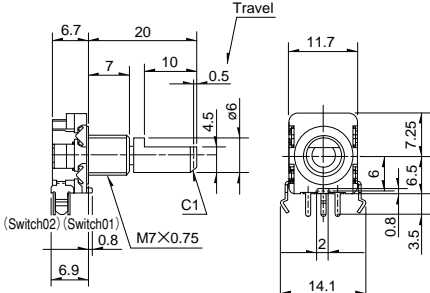
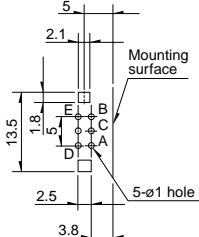

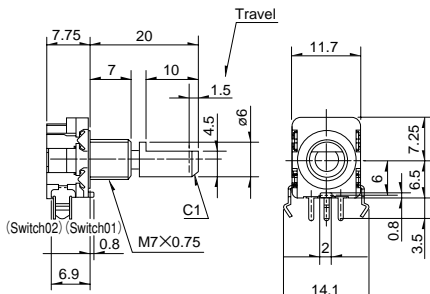
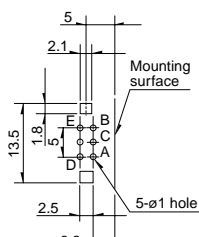
We have many other products in stock. Please contact our sales department if you are interested.

Dimensions

No.	Model	Style	PC board mounting hole dimensions (Viewed from mounting face)
1	Standard	 	
2	Standard with push-on switch (travel 0.5mm)	 	

For other products, check varieties on P.189
 For other detailed specifications, see P.192, 193
 For attached parts, see P.233

Dimensions

No.	Model	Style	PC board mounting hole dimensions (Viewed from mounting side)
3	Standard with push-on switch (travel 1.5mm) 		
4	Standard 		
5	Standard with push-on switch (travel 0.5mm) 		
6	Standard with push-on switch (travel 1.5mm) 		

Power

Push

Slide

Rotary

Encoders

Jog Shuttle

Telephone-hook

Detector

Vibration Sensors

Dual-in-line Package Type

Multi Control Devices


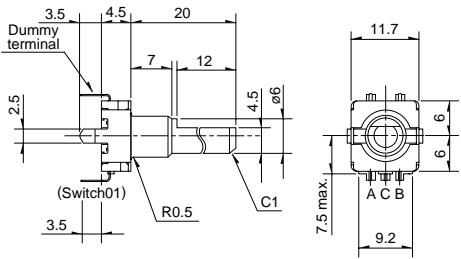
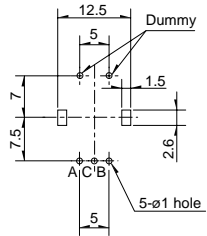

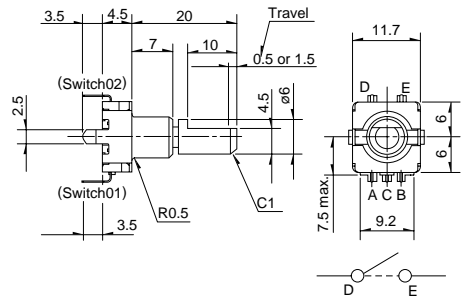
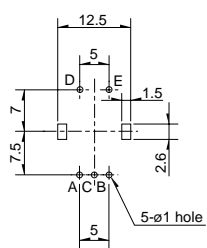
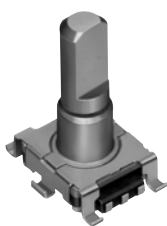
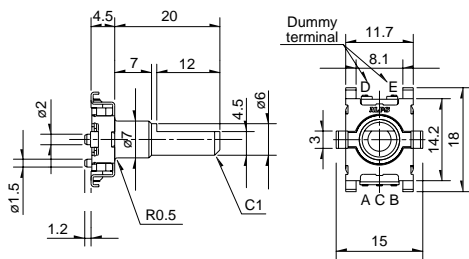
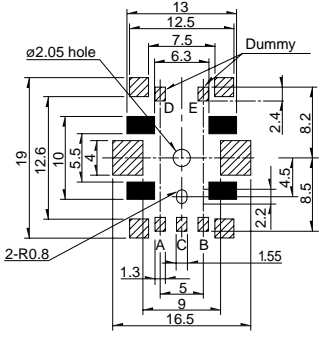
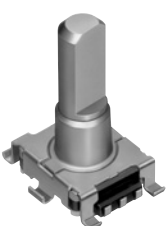
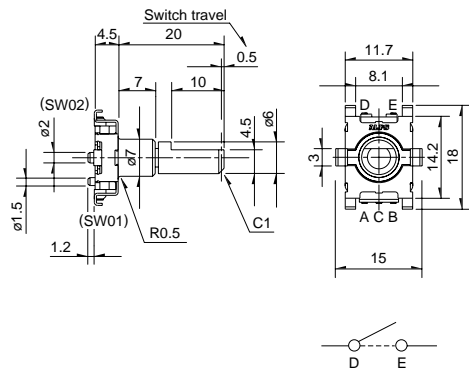
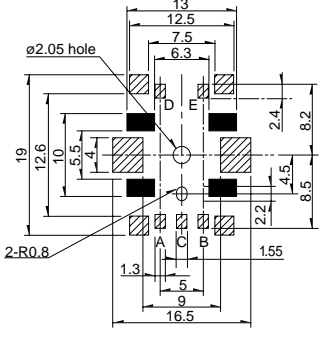
TACT

Incremental Type

Absolute Type

Dimensions

Unit : mm

No.	Model	Style	PC board mounting hole dimensions (Viewed from mounting side)
7	<p>Low-profile type</p> 		
8	<p>Low-profile type with push-on switch (travel 0.5/1.5mm)</p> 		
9	<p>Low-profile type and reflow applicable parts</p> 		 <p>PC board Mounting detail A slant line part shows the solder land Black part: Do not solder and no wiring for electrical contact</p>
10	<p>Low-profile type and reflow applicable parts with push-on switch (travel 0.5mm)</p> 		 <p>PC board Mounting detail A slant line part shows the solder land Black part: Do not solder and no wiring for electrical contact</p>

Dimensions

Unit : mm

No.	Model	Style	PC board mounting hole dimensions (Viewed from mounting side)
11	Low-profile type with push-lock mechanism		
12	Low-profile type with push-lock switch		
13	Low-profile type with self-return switch		
14	Low-profile type with self-return switch (travel 0.5mm / 1.5mm)		

Power

Push

Slide

Rotary

Encoders

Jog Shuttle

Telephone-hook

Detector

Vibration Sensors

Dual-in-line Package Type

Multi Control Devices

TACT

Incremental Type

Absolute Type

Products Specifications

Items	Standard type EC11B		Low-profile type EC11E		Low-profile type EC111	20mm size EC20A		
	Standard type	Double torque type	Standard type	Reflow type	Self-return switch			
Power	Operating temperature range					-30 to +85°C	-30 to +80°C	
Push	Maximum operating current (Resistive load)					10mA	0.5mA	
Slide	Rating					10mA 5V DC	0.5mA 5V DC	
Rotary	Output signal				Self-return switch	Output of A and B signals, proportionate to phase difference		
Encoders	Insulation resistance					250V DC 100MΩ min.	50V DC 10MΩ min.	
Jog Shuttle	Voltage proof					300V AC	50V AC	
Telephone-hook	Rotational torque				—	3 to 30mN·m	—	
Detector	Detent torque		12±7mN·m	16±7mN·m	10±7mN·m	6±4mN·m	—	40±20mN·m
Vibration Sensors	Push-pull strength					100N		
Dual-in-line Package Type	Manual soldering						300°C or less, or within 3s	
Multi Control Devices	Resistance to soldering heat	Dip soldering		260±5°C, 5±1s		—	260±5°C, 5±1s	
TACT		Reflow soldering		—		Please see P.190	—	
Durability	Rotational life					15,000 cycles	30,000 cycles	
Incremental Type	Cold					-40±3°C for 240h		
Absolute Type	Dry heat					85±3°C for 240h		
	Damp heat					60±2°C, 90 to 95%RH for 240h		

Push-on Switch Specifications

Items	Standard type EC11B		Low-profile type EC11E / EC111		20mm size EC20A
Switch circuit · the number of contact	Single pole and single throw (Push-on)				
Travel of switch	0.5 ^{+0.4} _{-0.3} mm	1.5±0.5mm	0.5±0.3mm	1.5±0.5mm	
Operating force of switch	6±3N	5±2N	6 ^{+2.5} ₋₂ N	4±2N	
Rating	DC 16V 3A (10mA 16V DC min ratings)		DC 16V 0.5A (1mA 16V DC min ratings)		
Contact resistance	100m Ω for initial period; 200m Ω after rotational life				
Operating life	25,000 times min.	20,000 times min.			

Products Specifications

Output Wave

Standard type EC11B		Low-profile type EC11E		Low-profile type EC111	20mm size EC20A																	
Standard type	Heavy torque type	Standard type	Reflow type	Self-return switch																		
<p>EC11B, EC11E 30 detents, 15 pulse EC11E 18 detents, 9 pulse EC11B 20 detents, 20 pulse</p> <p>The stable detent position cannot be identified in phase B. EC11E 18 detents 9 pulse EC11E 36 detents 18 pulse</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></td> </tr> <tr> <td>B (Terminal B-C)</td> <td></td> </tr> <tr> <td rowspan="2">Counter-clockwise</td> <td>A (Terminal A-C)</td> <td></td> </tr> <tr> <td>B (Terminal B-C)</td> <td></td> </tr> <tr> <td colspan="2"></td> <td>The broken line shows Detent stability position</td> </tr> </tbody> </table>	Shaft rotational Direction	Signal	Output	Clockwise	A (Terminal A-C)		B (Terminal B-C)		Counter-clockwise	A (Terminal A-C)		B (Terminal B-C)				The broken line shows Detent stability position
Shaft rotational Direction	Signal	Output																				
Clockwise	A (Terminal A-C)																					
	B (Terminal B-C)																					
Counter-clockwise	A (Terminal A-C)																					
	B (Terminal B-C)																					
		The broken line shows Detent stability position																				

Sliding Noise

Standard type EC11B		Low-profile type EC11E		Low-profile type EC111	20mm size EC20A			
Standard type	Heavy torque type	Standard type	Reflow type	Self-return switch				
<p>V1=V2=1.5V max.</p> <p>Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering</p>					<p>V1=V2=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 :3ms max. Bounce :2ms max.</p>	<p>At R = 5kΩ Chattering :8ms max. Bounce :5ms max.</p>

Power

Push

Slide

Rotary

Encoders

Jog Shuttle

Telephone-hook

Detector

Vibration Sensors

Dual-in-line Package Type

Multi Control Devices

TACT

Incremental Type

Absolute Type

Variety

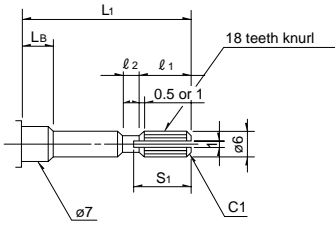
Standard Dimensions of Shaft

1. Single-shaft Type

1) Knurled Type

Unit : mm

Style (Shaft diameter : $\phi 6$)

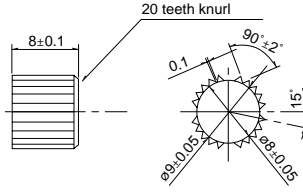


● Detail dimensions

L ₁	L _B	l ₁	l ₂	S ₁
15	5	6	1	7
15	7	4	1	5
20	7	6	1	7
25	7	10	2	11

※ Except EC111

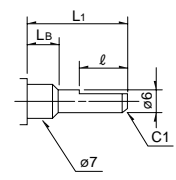
Style (Shaft diameter : $\phi 9$)
Applicable to models with a push lock mechanism only.



2) Flat Type

Unit : mm

Style (Shaft diameter : $\phi 6$)



● Detail dimensions

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

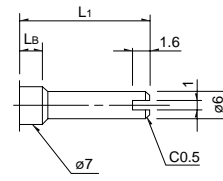
※ Except EC111

Dimensions in parentheses () are given for the type without a push-on switch.

3) Slotted Type

Unit : mm

Style (Shaft diameter : $\phi 6$)



● Detail dimensions

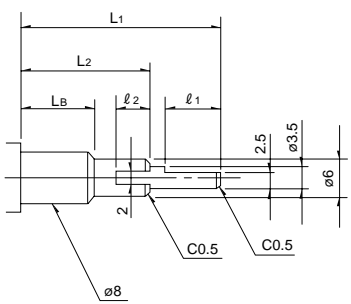
L ₁	L _B
15	7
20	7
25	7

2. Standard Dimensions of Dual-shaft Type

1) Flat Type

Unit : mm

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



● Detail 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 parts in the shaft type are applied to the specifications for the product line described in p. 183 and 184.
- Additional switches not included in the above list are also available. Contact us for details.

Power

Push

Slide

Rotary

Encoders

Jog Shuttle

Telephone-hook

Detector

Vibration Sensors

Dual-in-line Package Type

Multi Control Devices

TACT

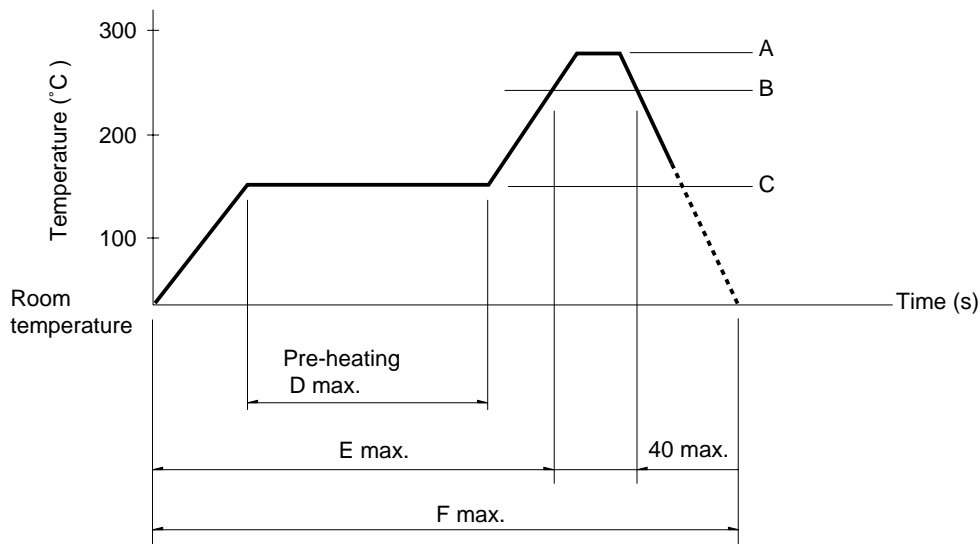
Incremental Type

Absolute Type

Soldering Condition

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) 10s max.	B (°C)	C (°C)	D (s)	E (s)	F (s)
EC11E154□5	240±10	200	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. You are requested to verify the soldering conditions thoroughly beforehand.

- Power
- Push
- Slide
- Rotary
- Encoders**
- Jog Shuttle
- Telephone-hook
- Detector
- Vibration Sensors
- Dual-in-line Package Type
- Multi Control Devices
- TACT

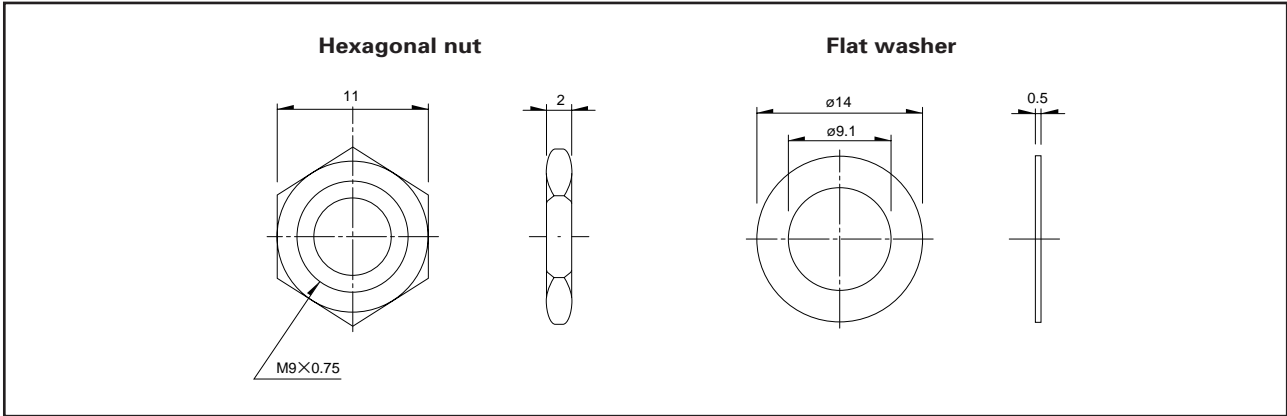
- Incremental Type
- Absolute Type

Attached Parts

These parts are attached to the following products.

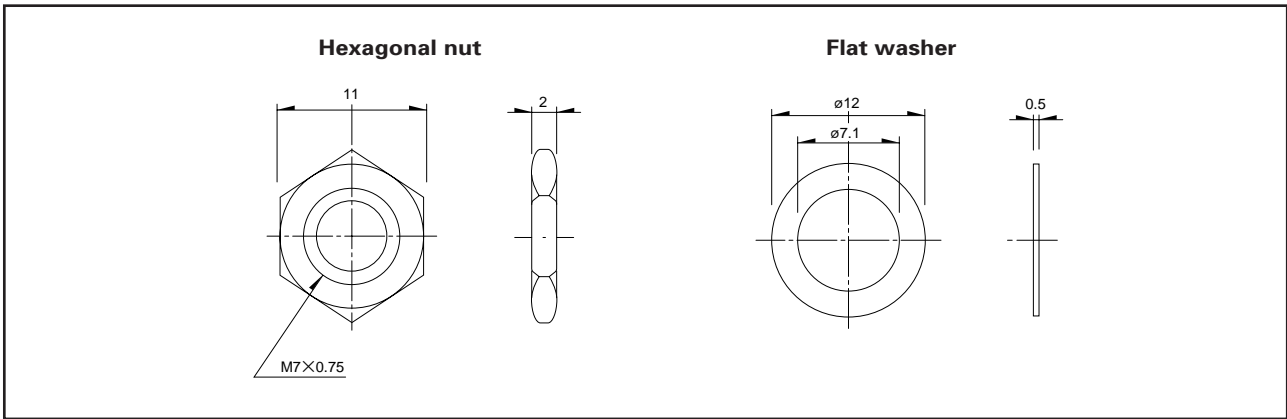
SRGH Series

Unit : mm



RK09710E, EC11B Series

Unit : mm



Power

Push

Slide

Rotary

Encoders

Jog Shuttle

Telephone-hook

Detector

Vibration Sensors

Dual-in-line Package Type

Multi Control Devices

TACT

Incremental Type

Absolute Type