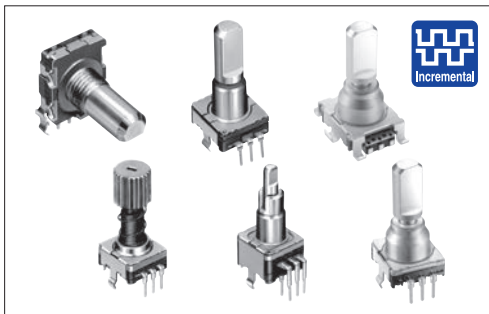


Compact and highly reliable type available in many varieties



Typical Specifications

Items	Specifications
Output signal	Two phase of A, B Self-return switch (EC111 / EC11E0B)
Rating	10mA 5V DC
Operating life	15,000 cycles 100,000 cycles (EC11K / EC11J)
Operating temperature range	-40°C to +85°C

Product Line

Structure	Shaft configuration	Length of the shaft (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.	
									Japan	Export			
Horizontal	Flat	20	12±7	30	15	Without	—	15,000	700	1,400	EC11B15202AN	1	
						With	0.5				EC11B15242AZ	2	
							1.5				EC11B15242B1	3	
Vertical			10±7	18	9	Without	—		1,200	2,400	EC11E09204A4	4	
				30	15						EC11E15204A3		
				36	18						EC11E1820402		
				18	9	With	0.5				EC11E09244BS	5	
			30	15	EC11E15244G1								
			7 ⁺³ ₋₄		Without						EC11E153440D		
			10±7	36	18						EC11E18244AU		
			7 ⁺³ ₋₄	Without							EC11E183440C		
			10±7	18	9		1.5				EC11E09244AQ		
			30	15	EC11E15244B2								
			7 ⁺³ ₋₄		Without						EC11E1534408		
			10±7	36	18						EC11E18244A5		
7 ⁺³ ₋₄	Without	EC11E1834403											
Less shaft wobble	Serrated	25	12±7	30	15	Without	—	1,000			2,000	EC11G1560414	6
			8.5±5	Without		With	1.5					EC11G1574402	7
			12±7	30					EC11G1564411	8			
Vertical	Flat	20	12±5	18	9	Without	—		100,000	9		EC11K0920404	10
				30	15							EC11K1520406	
				18	9	With	0.5					EC11K0924404	10
				30	15							EC11K1524406	
				18	9		1.5					EC11K0925416	
				30	15							EC11K1525413	

Note

Other varieties are also available. Please inquire.

Refer to P.282 for product specifications.
 Refer to P.283 for attached parts.
 Refer to P.285 for product varieties.
 Refer to P.315 for soldering conditions.

Product Line

Structure	Shaft configuration	Length of the shaft (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.
									Japan	Export		
Reflow	Flat	20	12±5 (Initial) 10±4 (After reflow)	18	9	Without	—	100,000	600	600	EC11J0920404	11
				30	15						EC11J152040F	
				18	9	With	0.5				12	EC11J0924411
				30	15							EC11J1524413
				18	9		1.5					EC11J0925403
												EC11J1525402
Push lock	20-tooth Serrated	25	10±7	30	15	Without	—	800	1,600	EC11E152T409		13
		26.4				With	8			EC11E152U402		14
Self-return switch	Flat	15	3 to 30	Without	Self-return switch	Without	—	15,000	1,200	2,400	EC1110120005	15
		20				With	0.5				EC111012010H	16
							1.5				EC1110120201	
							Inner-shaft=25 Outer-shaft=15				10±7	30
Flat	Inner-shaft=25 Outer-shaft=15	With	1.5	18								
Dual-shaft	Slotted	Outer-shaft=15	3 to 30		Without	Self-return switch	Without	—	EC11E0B2LB01			

Note

Other varieties are also available. Please inquire.

Packing Specifications

Tray

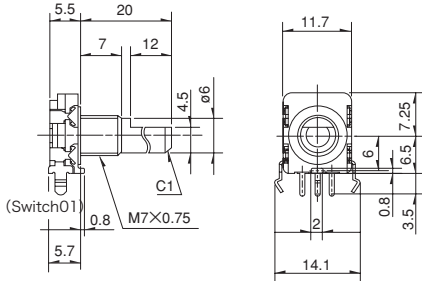
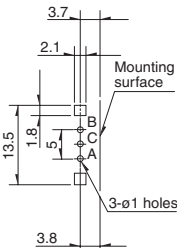
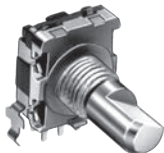
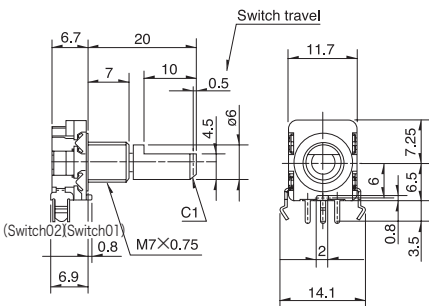
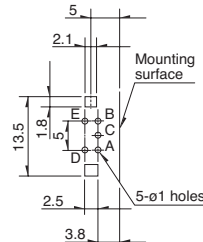
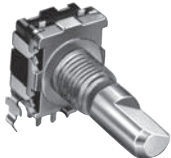
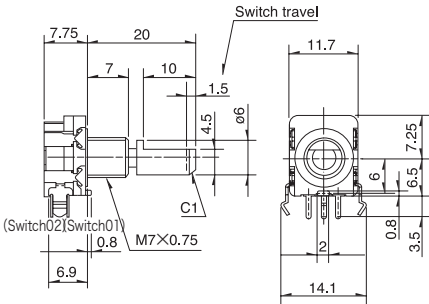
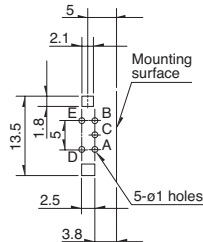
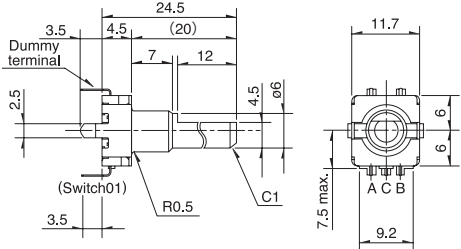
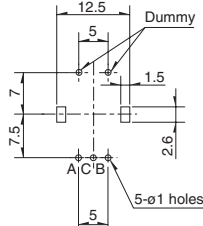
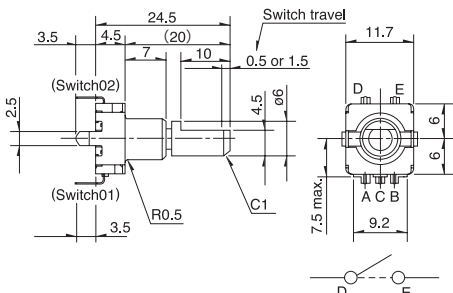
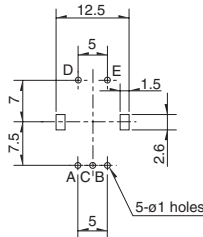
Product No.	Number of packages (pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
EC11B	700	1,400	370×520×201
EC11E09 / 15 / 18	1,200	2,400	540×360×250
EC11G / EC11K	1,000	2,000	
EC11J	600	600	369×283×263
EC11E152T / U	800	1,600	363×507×230
EC111	1,200	2,400	363×507×216
EC11E0B / BB	700	1,400	

Refer to P.282 for product specifications.
 Refer to P.283 for attached parts.
 Refer to P.285 for product varieties.
 Refer to P.315 for soldering conditions.

EC11 11mm Size Metal Shaft Type

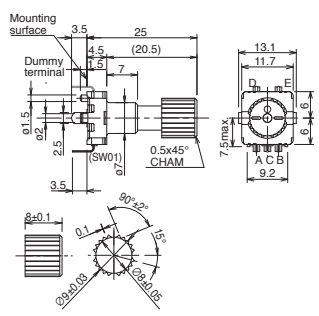
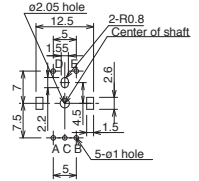
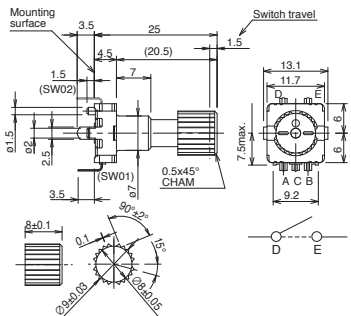
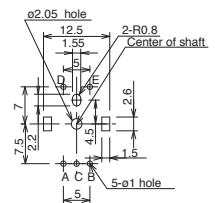
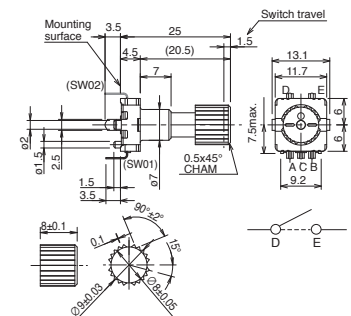
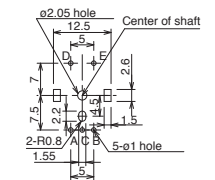
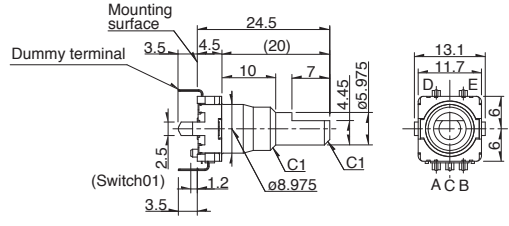
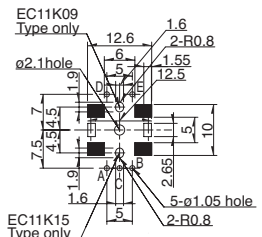
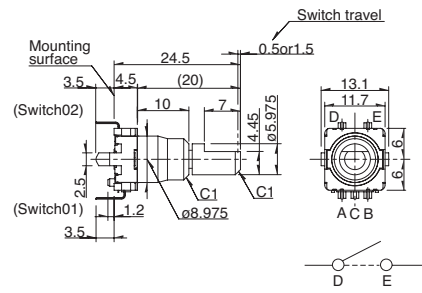
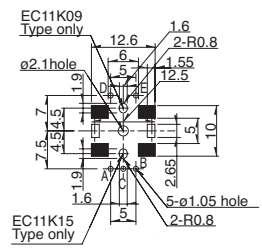
Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1	EC11B Horizontal 		
2	EC11B Horizontal with push-on switch (travel 0.5mm) 		
3	EC11B Horizontal with push-on switch (travel 1.5mm) 		
4	EC11E Vertical 		
5	EC11E Vertical with push-on switch (travel 0.5mm / 1.5mm) 		

Dimensions

Unit:mm

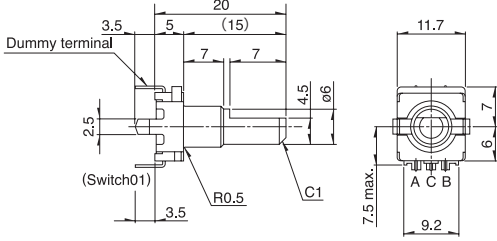
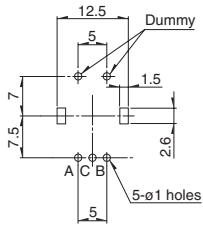
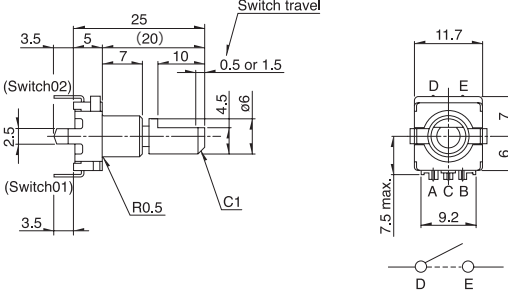
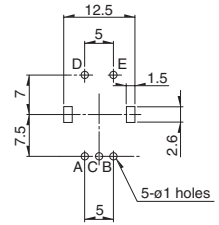
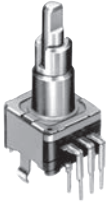
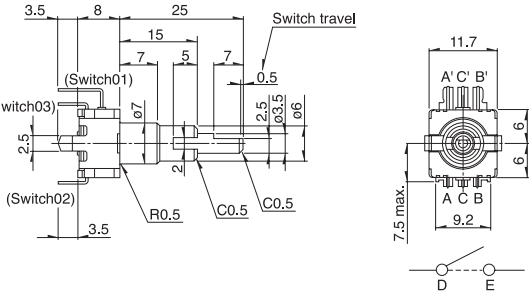
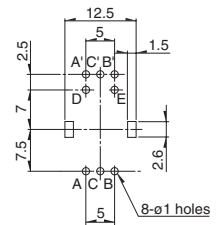
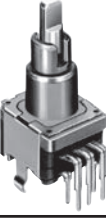
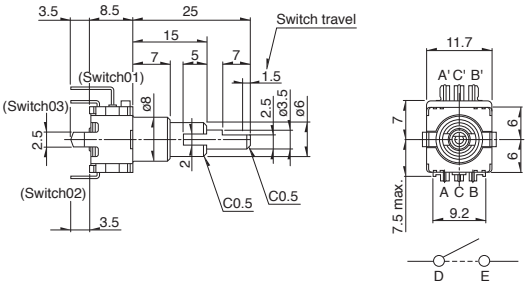
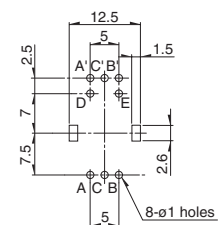
No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
6	EC11G Vertical 		
7	EC11G Vertical with push-on switch (travel 1.5mm) 		
8	EC11G Vertical with push-on switch (travel 1.5mm) 		
9	EC11K Vertical 		 EC11K09 Type only EC11K15 Type only Black part : Do not solder and no wiring for electrical contact.
10	EC11K Vertical with push-on switch (travel 0.5mm / 1.5mm) 		 EC11K09 Type only EC11K15 Type only Black part : Do not solder and no wiring for electrical contact.

PC board mounting hole dimensions
(Viewed from mounting side)

Technical drawing of a mechanical part with dimensions and labels:

- Overall width: 12.5
- Distance from left edge to centerline: 7.5
- Distance from centerline to right edge: 1.5
- Distance from top edge to centerline: 7
- Distance from centerline to bottom edge: 2.6
- Distance from left edge to point D: 5
- Distance from centerline to point E: 5
- Labels: D, E, A, B, C
- Feature: 5- $\phi 1$ holes

■ Dimensions

Unit:mm			
No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
15	EC111 Self-return switch 	 20 (15) 3.5 5 7 7 4.5 Dummy terminal (Switch01) R0.5 C1 7.5 max. 11.7 7 6 9.2 A C B	 12.5 5 1.5 7 7.5 2.6 A C B 5-ϕ1 holes 5
16	EC111 Self-return switch with push-on switch (travel 0.5mm / 1.5mm) 	 25 (20) 3.5 5 7 10 0.5 or 1.5 (Switch02) (Switch01) R0.5 C1 7.5 max. 11.7 D E 7 6 9.2 A C B D E 5-ϕ1 holes	 12.5 5 1.5 7 7.5 2.6 A C B 5-ϕ1 holes 5
17	EC11E Dual-shaft type with push-on switch (travel 0.5mm) Inner shaft: encoder Outer shaft: encoder 	 3.5 8 25 (Switch01) 7 5 7 0.5 Switch travel witch03) (Switch02) R0.5 C0.5 C0.5 7.5 max. 11.7 A' C' B' A C B 7 6 9.2 D E 5-ϕ1 holes	 12.5 5 1.5 2.5 7 7.5 2.6 A' C' B' A C B 8-ϕ1 holes 5
18	EC11E Dual-shaft type with push-on switch (travel 1.5mm) Inner shaft: encoder Outer shaft: self-return switch 	 3.5 8.5 25 (Switch01) 7 5 7 1.5 Switch travel (Switch03) (Switch02) C0.5 C0.5 7.5 max. 11.7 A' C' B' A C B 7 6 9.2 D E 8-ϕ1 holes	 12.5 5 1.5 2.5 7 7.5 2.6 A' C' B' A C B 8-ϕ1 holes 5

Encoders

Metal Shaft

Insulated Shaft

Hollow Shaft

Ring Type

EC11 11 mm Size Metal Shaft Type

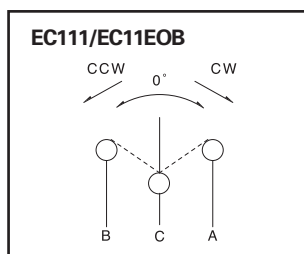
Output Wave

EC11B / EC11E / EC11G	EC11E / EC11J / EC11K
EC11B, EC11E, EC11G 30 detents, 15 pulse Detent stability position CW direction	Detent stability position cannot be specified for B signal. EC11E 18 detents 9 pulse EC11E 36 detents 18 pulse EC11J, EC11K Detent stability position CW direction

Sliding Noise

Test circuit 5V DC R Terminal A Terminal B Encoder Terminal C Measurement condition : Rotation speed 360°/s	Output waveform 5V ON OFF ON Sliding direction t V₁ V₂ t : Masking time to avoid chattering	<table><tr><td>EC11B</td><td>V₁=V₂=1.5V max. At R = 5kΩ Chattering : 2ms max. Bounce : 2ms max.</td></tr><tr><td>EC11E / EC11G</td><td>V₁=V₂=1.5V max. At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.</td></tr><tr><td>EC11J / EC11K</td><td>V₁=V₂=2.5V max. At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.</td></tr></table>	EC11B	V ₁ =V ₂ =1.5V max. At R = 5kΩ Chattering : 2ms max. Bounce : 2ms max.	EC11E / EC11G	V ₁ =V ₂ =1.5V max. At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.	EC11J / EC11K	V ₁ =V ₂ =2.5V max. At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.
EC11B	V ₁ =V ₂ =1.5V max. At R = 5kΩ Chattering : 2ms max. Bounce : 2ms max.							
EC11E / EC11G	V ₁ =V ₂ =1.5V max. At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.							
EC11J / EC11K	V ₁ =V ₂ =2.5V max. At R = 5kΩ Chattering : 3ms max. Bounce : 2ms max.							

Circuit Diagram



11 mm Size Metal Shaft Type / Attached Parts

The following parts are included with the product.

EC11B Series

Unit:mm

Nut	Washer
11 2 M7 x 0.75	12 7.2 0.5

1 1 mm Size Metal Shaft Type / Product Varieties

■ Shaft Dimensions

1. Single-shaft Type

1) Serrated Type

Unit:mm

EC11
Style (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	10	10	2	11

EC11K / EC11J
Style (Shaft diameter: $\phi 6$)

● Detailed dimensions

L_1	L_B	l_1
15	7	5
20	10	6

EC11G
Style (Shaft diameter: $\phi 9$)

● Detailed dimensions

L	L_1	L_B
18	13.5	5
25	20.5	7
28	23.5	10

2) Flat Type

Unit:mm

EC11
Style (Shaft diameter: $\phi 6$)

● Detailed dimensions

	L_1	L_B	l
※1	15	5	7
	15	7	5 (6)
	20	7	10 (12)
※2	25	10	12

※1 Does not comply with EC111

※2 $L_B=7$ for EC11B.

Values in parentheses apply to products without push-on switch.

EC11K / EC11J
Style (Shaft diameter: $\phi 5.975$)

● Detailed dimensions

	L_1	L_B	l
	15	7	5
	20	10	7

Notes

- The highlighted figures in shaft types refer to Product Specifications in P.276 and P.277.
- Other varieties are also available. Please inquire.

1 1 mm Size Metal Shaft Type / Product Varieties

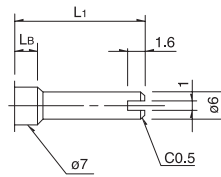
■ Shaft Dimensions

1. Single-shaft Type

3) Slotted Type

Unit:mm

EC11 Style (Shaft diameter: $\phi 6$)



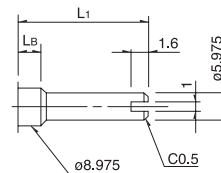
● Detailed dimensions

L_1	L_B
15	7
20	7
25	10

※

※ $L_B=7$ for EC11B

EC11K / EC11J Style (Shaft diameter: $\phi 5.975$)



● Detailed dimensions

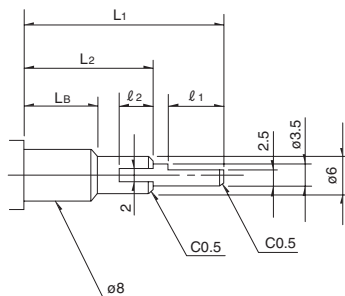
L_1	L_B
15	7
20	10

2. Standard Dimensions and Configuration of Dual-shaft Type

Flat Type

Unit:mm

EC11E Style (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

※ $\phi 7$ for type with inner / outer shaft encoders (EC11EBB)

Notes

1. The highlighted figures in shaft types refer to Product Specifications in P.276 and P.277.
2. Other varieties are also available. Please inquire.

1 1mm Size Metal Shaft Type/Switch Specifications

Encoders

Metal Shaft

Insulated Shaft

Hollow Shaft

Ring Type

1. EC11B Series

Switch type		Momentary push switch	
Contact arrangement		Single pole and single throw (Push-on)	
Travel (mm)		$0.5 \pm_{-0.3}^{+0.4}$	1.5 ± 0.5
Operating force		$6 \pm 3\text{N}$	$5 \pm 2\text{N}$
Operating life		25,000 times	20,000 times
Electrical performance	Rating	0.1A 5V DC (500 μ A 5V DC min. ratings)	
	Contact resistance	100m Ω max. for initial period, 200m Ω max. after operating life.	
	Insulation resistance	100M Ω min. 250V DC	
	Voltage proof	300V AC for 1 minute or 360V AC for 2 second	

2. EC11E/EC111 Series

Switch type		Momentary push switch	
Contact arrangement		Single pole and single throw (Push-on)	
Travel (mm)		0.5 ± 0.3	1.5 ± 0.5
Operating force		$6 \pm_{-2}^{+2.5}\text{N}$	$4 \pm 2\text{N}$
Operating life		20,000 times	
Electrical performance	Rating	0.1A 5V DC (500 μ A 5V DC min. ratings)	
	Contact resistance	100m Ω max. for initial period, 200m Ω max. after operating life.	
	Insulation resistance	100M Ω min. 250V DC	
	Voltage proof	300V AC for 1 minute or 360V AC for 2 second	

3. EC11G Series

Switch type		Momentary push switch	
Contact arrangement		Single pole and single throw (Push-on)	
Travel (mm)		1.5 ± 0.35	
Operating force		$5 \pm 2\text{N}$	
Operating life		20,000 times	
Electrical performance	Rating	0.15A 5V DC (500 μ A 5V DC min. ratings)	
	Contact resistance	100m Ω max. for initial period, 200m Ω max. after operating life.	
	Insulation resistance	100M Ω min. 250V DC	
	Voltage proof	300V AC for 1 minute or 360V AC for 2 second	

4. EC11K/EC11J Series

Switch type		Momentary push switch	
Contact arrangement		Single pole and single throw (Push-on)	
Travel (mm)		0.5 ± 0.3	1.5 ± 0.5
Operating force		$5 \pm 2\text{N}$	$4 \pm 2\text{N}$
Operating life		1,000,000 times	100,000 times
Electrical performance	Rating	0.1A 5V DC (0.1mA 5V DC min. ratings)	
	Contact resistance	100m Ω max. for initial period, 200m Ω max. after operating life.	
	Insulation resistance	100M Ω min. 250V DC	
	Voltage proof	300V AC for 1 minute or 360V AC for 1 second	

5. EC11E152U Series

Switch type		Push lock mechanism switch	
Contact arrangement		Single pole and single throw (Push-on)	
Travel (mm)		8 ± 0.8	
Operating force		8N max.	
Operating life		10,000 times	
Electrical performance	Rating	0.1A 5V DC (500 μ A 5V DC min. ratings)	
	Contact resistance	100m Ω max. for initial period, 200m Ω max. after operating life.	
	Insulation resistance	100M Ω min. 250V DC	
	Voltage proof	300V AC for 1 minute or 360V AC for 2 second	

Encoders

List of Varieties

Encoders

Metal Shaft

Insulated Shaft

Hollow Shaft

Ring Type

Type		Metal shaft									
		9mm size		11mm size							
Series		EC09E		EC11B		EC11E				EC11G	
Photo						 					
Output		Incremental (Two phase A and B)									
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 or without 18 / 36 or without				15 / 30 or without	
Features		—		—		Without detent Push-lock mechanism		—		Less shaft wobble	
Dimensions (mm)	W	9.5		11.7							
	D			13.75		12					
	H	4.5		5.5 / 6.7 / 7.75		4.5		8 / 8.5		4.5	
Operating temperature range		-40℃ to +85℃									
Operating life		15,000 cycles									
Automotive use											
Life cycle (availability)											
Electrical performance	Rating	10mA 5V DC									
	Max./min. operating current (Resistive load)	10mA / 1mA									
	Insulation resistance	100MΩ min. 250V DC									
	Voltage proof	300V AC for 1 minute or 360V AC for 1s		300V AC for 1 minute or 360V AC for 2s							
Mechanical performance	Rotational torque (Without detent)	—		—		7 ± ³ / ₄ mN·m		—		8.5±5mN·m	
	Detent torque	8±5mN·m		12±7mN·m		10±7mN·m				12±7mN·m	
	Push-pull strength	100N									
Shaft configuration		Flat		Flat, Slotted, Serrated				Inner-shaft : Flat Outer-shaft : Slotted		Serrated	
Terminal type		Insertion									
Switch Specifications	Switch type	Push-on switch						Push-lock mechanism switch ※	Push-on switch		
	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	1.5±0.35
	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	5±2
	Rating	10mA 5V DC (1mA 5V DC min. ratings)		0.1A 5V DC (500μA 5V DC min. ratings)							
	Contact resistance	100mΩ max. for initial period; 200mΩ max. after operating life.									
	Operating life	10,000 times		25,000 times	20,000 times			10,000 times	20,000 times		
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Notes

- ※marked specification is only applicable to EC11E152U402.
- Indicates applicability to all products in the series.

Encoders

List of Varieties

Type		Metal shaft											
		11mm size						20mm size					
Series		EC111		EC11K		EC11J		EM11B		EC20A		EM20B	
Photo													
Output		Self-return switch		Incremental (Two phase A and B)									
Shaft types		Single-shaft											
Operating direction		Vertical											
Number of pulse / Number of detent		—		9/18 15/30				16/16		18/18		40/40	
Features		—		—		Surface Mount type		Magnetic type		—		Magnetic type	
Dimensions (mm)	W	11.7						10.8		20.2		20	
	D	13		12		14.2		11		19.2		22.25	
	H	5		4.5				7.5		10		13	
Operating temperature range		−40℃ to +85℃						−30℃ to +85℃		−30℃ to +80℃		−10℃ to +70℃	
Operating life		15,000 cycles		100,000 cycles				1,000,000 cycles		30,000 cycles		500,000 cycles	
Automotive use												—	
Life cycle (availability)													
Electrical performance	Rating	10mA 5V DC						10mA 5V±5% DC		1mA 5V DC		10mA 5V±5% DC	
	Max/min. operating current (Resistive load)	10mA / 1mA						15mA / —		—		15mA / —	
	Insulation resistance	100MΩ min. 250V DC						100MΩ min.100V DC		10MΩ min. 50V DC		100MΩ min. 250V DC	
	Voltage proof	300V AC for 1 minute or 360V AC for 2s		300V AC for 1 minute or 360V AC for 1s				250V AC for 1 minute or 300V AC for 2s		50V AC for 1 minute or 60V AC for 2s		300V AC for 1 minute or 360V AC for 2s	
Mechanical performance	Rotational torque (Without detent)	3 to 30mN·m		—		—		—		—		7mN·m max.	
	Detent torque	—		12±5mN·m		12±5mN·m (Initial) 10±4mN·m (After reflow)		10±5mN·m		40±20mN·m		8±5mN·m	
	Push-pull strength	100N											
Shaft configuration		Flat, Slotted, Serrated						Flat					
Terminal type		Insertion				Reflow		Insertion					
Switch Specifications	Switch type	Push-on switch											
	Contact arrangement	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	1.5±0.5	0.5 ± ^{0.3} _{0.2}	1.5±0.5	0.5 ± ^{0.4} _{0.3}			
	Operating force (N)	6 ± ^{2.5} ₂	4±2	5±2	4±2	5±2	4±2	5.5±3	4±2	6±3			
	Rating	0.1A 5V DC (500μA 5V DC min. ratings)		0.1A 5V DC (0.1mA 5V DC min. ratings)				5mA 5V DC (50mA 12V DC max. ratings)		0.5A 16V DC (1mA 16V DC min. ratings)		3A 16V DC (10mA 16V DC min. ratings)	
	Contact resistance	100mΩ max. for initial period, 200mΩ max. after operating life.						500mΩ max. for initial period, 5mΩ max. after operating life.		100mΩ max. for initial period, 200mΩ max. after operating life.			
	Operating life	20,000 times	1,000,000 times	100,000 times	1,000,000 times	100,000 times	1,000,000 times	1,000,000 times	20,000 times	25,000 times			
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Note

- Indicates applicability to all products in the series.

Reference for Manual Soldering

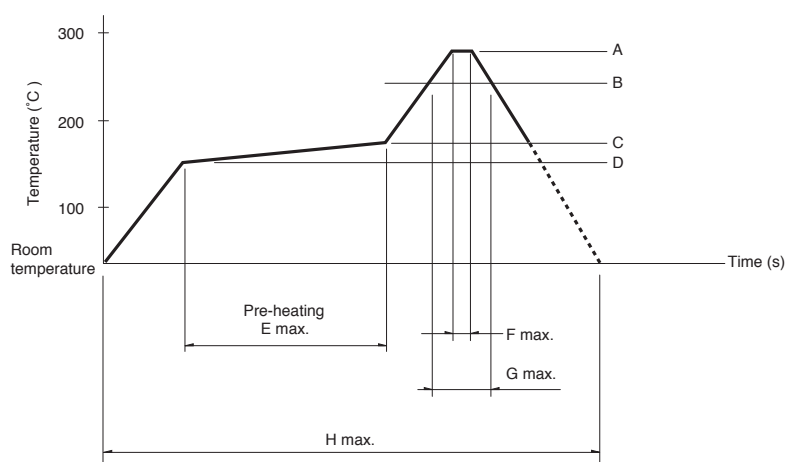
Series	Tip temperature	Soldering time	No. of solders
EC05E, EC09E, EC10E, EC111, EC11B, EC11E, EC11G, EC11K, EC12D, EC12E, EC18A, EC21A, EC28A, EC35A, EC35AH, EC35B, EC40A, EC45A, EC50A, EC60B, EM11B, EM20B, EC21C, EC28C, EC35CH	350°C max.	3s max.	1 time
EC11J	350±10°C	3 ⁺¹ ₀ s	2 times

Reference for Dip Soldering

Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
EC09E, EC11B, EC111, EC11E, EC11G, EC11K, EC18A, EC21A, EC28A, EC35A, EC35AH, EC35B, EC50A, EC60B	100°C max.	2 min. max.	260±5°C	5±1s	2 times max.
EC10E, EC12D, EC12E, EM11B	100°C max.	1 min. max.	260±5°C	3±1s	2 times max.
EC40A	110°C max.	1 min. max.	260°C max.	10s max.	1 time
EC45A	100°C max.	2 min. max.	260°C max.	5s max.	2 times max.
EM20B	80°C max.	1 min. max.	260°C max.	3s max.	2 times max.

Example of Reflow Soldering Condition

Temperature profile



Series	A	B	C	D	E	F	G	H	No. of reflows
EC11J	260°C	230°C	180°C	150°C	2 min. max.	3s	40s	4 min. max.	2 times max.
EC05E	250°C min.	230°C min.	180°C	150°C	60s to 120s	—	30s to 40s	—	2 times max.
EC21C	230°C to 245°C	220°C	200°C	150°C	60s to 120s	—	25s to 60s	300s max.	1 time max.
EC28C, EC35CH	260°C	230°C	180°C	150°C	2 min. min.	3s	40s	230s max.	1 time max.

注記

- When using an infrared reflow oven, solder may sometimes not be applied. Be sure to use a hot air reflow oven or a type that uses infrared rays in combination with hot air.
- The temperatures given above are the maximum temperatures at the terminals of the encoder when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the encoder may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the encoder does not rise to 250°C or greater.
- Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.

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