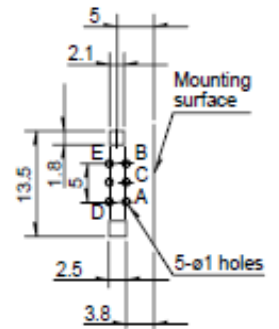
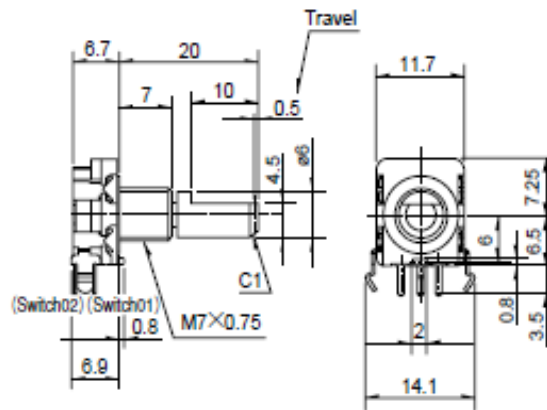


Horizontal with push-on switch (travel 0.5mm)



Product Specifications

Items		EC11B	EC11E/EC11G	EC11J	EC111	EC20A
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
Electrical performance	Rating	10mA 5V DC				0.5mA 5V DC
	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
	Insulation resistance	100MΩ min. 250V DC				10MΩ min. 50V DC
	Voltage proof	300V AC for 1minute				50V AC for 1min.
Mechanical performance	Rotational torque (without click feeling)	—	7^{+3}_{-4} mN·m	—	3 to 30mN·m	—
	Detent torque	12±7mN·m	10±7mN·m	12±5mN·m	—	40±20mN·m
	Push-pull strength	100N				
	Resistance to soldering heat	Manual soldering	350°C max. 3s max.			
Dip soldering		260±5°C, 5±1s		—	260±5°C, 5±1s	
Reflow soldering		—		Please see P.235	—	
Durability	Rotational life	15,000cycles		100,000cycles	15,000cycles	30,000cycles
Environmental performance	Cold	-40±3°C for 240h				
	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	$1.5 \pm_{8 \pm 0.8}^{0.5}$ ※	0.5 ± 0.3	1.5 ± 0.5		
Operating force(N)	6 ± 3	5 ± 2	$6 \pm_{2}^{2.5}$	$4 \pm_{8 \text{ max.}}^2$ ※	5 ± 2	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.

Output Wave

EC11B	EC11E/EC11G/EC11J	EC111	EC20A													
<p>EC11B, EC11E, EC11G 30 detents, 15 pulse</p> <p>A signal OFF ON B signal OFF ON</p> <p>Detent stability point CW direction</p>	<p>The stable detent position cannot be identified in phase B.</p> <p>EC11E 18 detents 9 pulse EC11G 36 detents 18 pulse EC11J</p> <p>A signal OFF ON B signal OFF ON</p> <p>Detent stability point CW direction</p>	<p>CCW 0° CW B C A</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														

Sliding Noise

EC11B	EC11E/EC11G/EC11J	EC111	EC20A
<p>$V_1=V_2=1.5V \text{ max.}$</p> <p>Test circuit 5V DC R Terminal A Terminal B Encoder Terminal C</p> <p>Output waveform 5V ON OFF ON Sliding direction t</p> <p>Measurement condition : Rotation speed 360°/s t : Masking time to avoid chattering</p>			<p>$V_1=V_2=1.5V \text{ max.}$</p> <p>Test circuit 5V DC R Terminal A Terminal B Encoder Terminal C</p> <p>Output waveform 5V ON OFF ON Sliding direction t</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>