

12mm Size Insulated Shaft Encoder Variety

Details

● With Switch Type

Product No.	Type	Length of operating selection	Torque	Number of detent
EC12E2424404	Insulated shaft	25mm	Standard 3 to 20mN·m	24

Resolution	Operating direction	Push-on switch	Travel of push-on switch	Minimum packing unit (pcs.)
24-pulses	Vertical	With (Switch operating force 3N)	0.5mm	1,200

Products Specifications

Operating temperature range	Maximum operating current (Resistive load)	Electrical performance			
		Ratings	Output signal	Insulation resistance	Voltage proof
-10° C to +60° C	5mA	0.5mA 5V DC	Output of A and B signals, proportionate to phase difference	10MΩ min. 50V DC	50V AC

Mechanical performance			Durability	Environmental performance		
Push-pull strength	Resistance to soldering heat		Rotational life	Cold	Dry heat	Damp heat
	Manual soldering	Dip soldering				
50N	300° C max. 3s max.	260±5° C, 3±1s	30,000 cycles	-40±3° C for 240h	85±3° C for 240h	40±2° C, 90 to 95%RH for 240h

Push-on switch specifications					
Switch circuit/ number of contact	Travel of switch	Operating force of switch	Ratings	Contact resistance	Operating life
Single pole and single throw (Push-on)	0.5(+0.4, -0.3)mm	3(+1.5, -1.0)N	1mA 5V DC	100mΩ for initial period; 200mΩ after rotational life	20,000 times min.

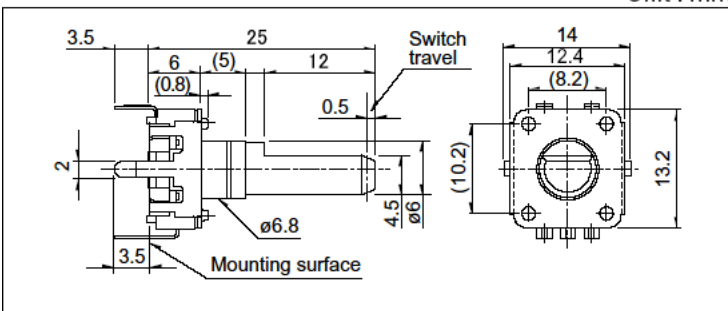
1. Place your purchase order in N minimum package units (N: integer).
2. Ask us for the export packaging unit.
3. Additional switches not included in the above list are also available. Contact us for details.
4. No nuts or washers attached (with bushing type). If necessary, contact us.

Photo
With push-on switch



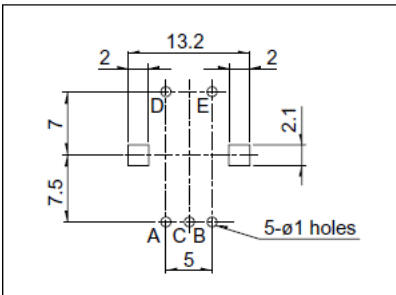
Dimensions

Unit : mm

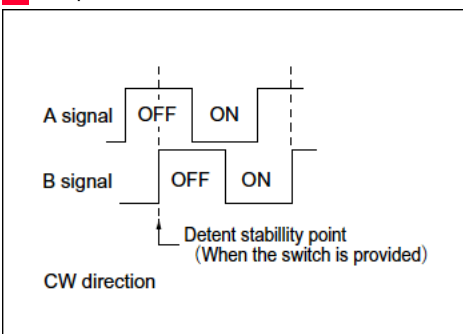


PC board Mounting Hole Dimensions (Viewed from Mounting Face)

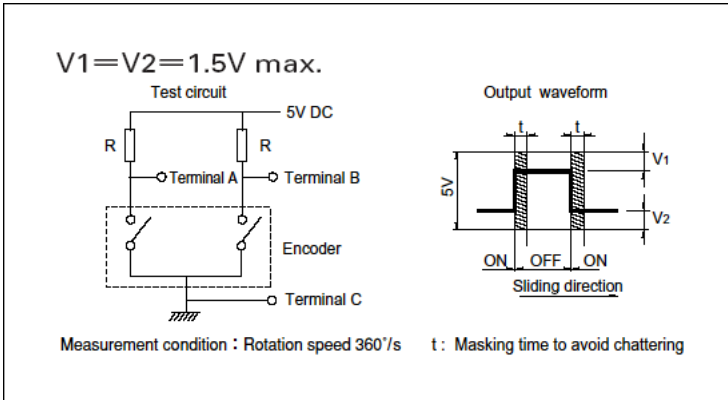
Unit : mm



Output Wave



■ Sliding Noise
 At $R=10k\Omega$
 Chattering: 3ms max.
 Bounce: 2ms max.



■ Flat Type

Unit : mm

With high collar type

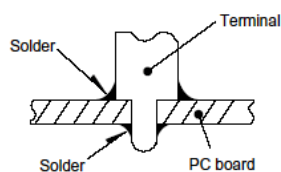
Vertical type

Detail dimensions

LM_1	l_1
17.5	5
20	7
22.5	7
25	12
30	12

Caution

1. Note that if the load is applied to the terminals during soldering, they might suffer deformation and defects in electrical performance.
2. Use of water-soluble soldering flux shall be avoided because it may cause corrosion of the switch.
3. Verify soldering conditions under actual mass production conditions.
4. When soldering twice, wait until the first soldered portion cools to normal temperature. Continuous heating will deform the external portions, loosen or dislodge terminals, or may deteriorate their electrical characteristics.
5. Flux from around and above the PC board should not adhere to the switches.
6. If you put the board with the switch in the oven so as to harden adhesive for other parts, consult with us.
7. If you use a through-hole PC board or a PC board thinner or thicker than the recommendation, there may be greater heat stress. Verify the soldering conditions thoroughly before use.
8. Solder the switches with detent at the detent position. Soldering switches fixed at the center of the detent may deform the detent mechanisms.
9. No cleaning.
10. Use care to protect small and thin switches from external forces in the SET mounting process.
11. Tighten the mounting screws by applying the specified torque. Tightening with larger torque than the specified one will result in malfunction or breakage of screws.
12. Use of the switches with voltage below 1V DC or current below 10 μ A may make contacts unstable. When using these switches in this way, consult with us beforehand.
13. This product is designed and manufactured assuming that it is to be used with the resistance for direct current. If you use other kinds of resistance [inductive (L) or capacitive (C)], consult with us beforehand.
14. The switch will be break if you apply a greater stress than that specified. Take great care not to let the switch be subject to greater stress than specified.
15. Insert these switches to the specified mounting surface and mount them horizontally. If not mounted horizontally, these switches will malfunction.
16. Avoid using these switches in a dusty environment. Dust entering through the openings will result in imperfect contact or malfunction. Take this into account for set design.
17. When corrosive gas is generated by peripheral material of a set using the switch, malfunctions such as imperfect contacts can occur. Be mindful of this point thoroughly in advance.
18. [Looseness of the Shaft]
When long shafts are being employed, the looseness (deviation) tends to grow in proportion to the shaft length. Checking shaft looseness under actual operational conditions is recommended.
19. [Soldering]
Do not employ wiring designs and soldering methods as illustrated in the schematic drawing. Molten solder flowing over the upper surface of PC board can cause imperfect contacts.

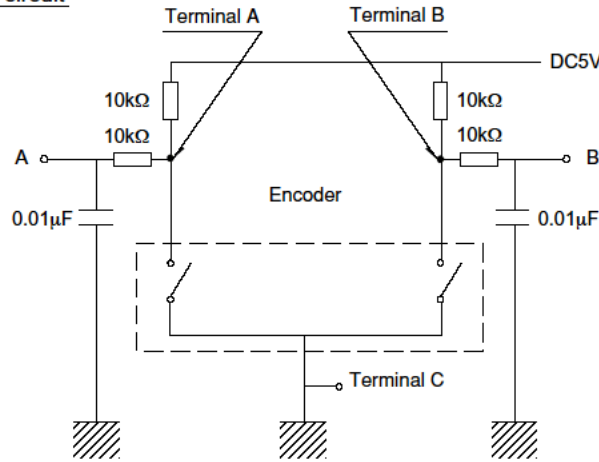


20. [Dew Condensation]
Do not use this product where dew or water drops might occur on the pattern surface of the encoder, etc. Insulation deterioration or shorting may occur.
21. [Use of Chemicals]
Since synthetic resins such as polycarbonate are being used as the material for the insulated type shafts, avoid using this product under gassy environments containing such chemicals as ammonia, amines, alkaline water solutions, aromatic hydrocarbons, ketones, esters and halogenated hydrocarbons, especially under their intensive gas environments.
22. [Operation at Low Temperature]
When these products are expected to be used under low temperature environments such as applications for car radios and car stereos, we can customize them for easier and more smooth rotary movements. When placing orders, indicate whether the low temperature specification is necessary or not.
23. [Handling of Products with Switches]
Avoid packaging or storing encoders with push-on switches with their shafts pushed-in. Be careful not to damage the switch portion.

24. [Pulse count process]

With respect to pulse count design of encoders, operational speed, sampling time, and masking time, etc. should be taken into consideration. Be sure to confirm these factors before using the encoder. For your pulse count design, consider adding C/R filters on your circuit as show below.

Example of filter circuit



25. Storage methods

- (1) If you do not use the product immediately, store it just as delivered in the following environment: with neither direct sunshine nor corrosive gas and in normal temperatures. However, it is recommended that you should use it as soon as possible or within six months from the date of delivery at the most.
- (2) After you break the seal, you should put the remainder in a plastic bag to shut out outside air, and store it in the same environment mentioned above. You should use it up as soon as possible.
- (3) Do not stack too many switches for safety.

Measurement and Test Methods

[Rotational Torque (Operating Force)]

Measures the torque (operating force) necessary to rotate (move) the shaft (lever). Unless otherwise specified, measurement shall be made at ambient temperatures of 5 to 35° C, the shaft rotational speed shall be 60° per second, and the lever traveling speed shall be 20mm per second.

[Shaft Wobble]

Measure the amount of deflection at the specified position from the reference plane, with the specified bending moment, applied perpendicularly to the shaft from directions different 180 degrees with respect to each other.

[Withstand Voltage]

Applies AC voltage to the specified spot for a minute and then checks for arc, burning, dielectric breakdown and other abnormalities. Respective terminals may be tested as a group. The sections described below shall be tested unless otherwise specified. However, if the section concerned is so constructed as to conduct, that particular part shall not be tested.

[Insulation Resistance]

Applies specified voltage to the specified locations and then measures the insulation resistance with a megger. The locations described below shall be tested unless otherwise specified. However, if the section concerned is so constructed as to conduct, that particular part shall not be tested.

[Sections to be Tested for Withstand Voltage and Insulation Resistance]

- Between terminal and shaft (lever).
- Between terminal and metal cover (frame).

[Shaft (Lever) Strength against Push/Pull Actions]

Applies a specified force in the axial direction of the shaft (lever) for 10 seconds and then checks the operating part and other sections for deformation, breakage, operating conditions, etc.