[Operating Voltage and Current]
Use of the switches with voltage below 1V DC or current below 10μA may make contacts unstable. When using these switches in this way, consult with us beforehand.
The products are designed and manufactured for direct current resistance. Contact us for use of other resistances such as inductive (L) or capacitive (C).

[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 shown below.

[Output Specifications]
Depending on the product, output at encoder detent positions can be specified either for both signals A and B, or for signal A only. Specifications vary according to the number of detents and other factors.

[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.

[Usage Environment]
Use of the encoders in a dusty environment may lead the dusts entering through the openings and cause imperfect contact or malfunction. Take this into account for set design.
Corrosive gas if generated by peripheral parts of a set, malfunction such as imperfect contact may occur. Thorough investigation shall be required beforehand.

[Operation]
The encoders will be break if you apply a greater stress than that specified. Take great care not to let the encoders be subject to greater stress than specified.

[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.
**Encoders / Cautions**

**[Installation]**
Insert these encoders to the specified mounting surface and mount them horizontally. If not mounted horizontally, these encoders will malfunction. 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. Protect small and thin encoders from external forces in the set mounting process.

**[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. Solder all metal lugs into a substrate before use.

![Soldering diagram]

Applying load to terminals during soldering under certain conditions may cause deformation and electrical property degradation. Avoid use of water-soluble soldering flux, since it may corrode the switches. Check and conform to soldering requirements under actual mass production conditions. 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. Flux from around and above the PC board should not adhere to the switches. After mounting the switches, if you intend to put the board into an oven in order to harden adhesive for other parts, please consult with Alps. If you use a through-hole PC board or a PC board thinner or thicker than the recommendation, here may be greater heat stress. Verify the soldering conditions thoroughly before use. Solder the switches with detent at the detent position. Soldering switches fixed at the center of the detent may deform the detent mechanisms. No washing.

**[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 intensive gas environments.

**[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.

**[Storage]**
1. Store the products as delivered, at a normal temperature and humidity, without direct sunshine and corrosive gas ambient. Use them at an earliest possible timing, not later than six months upon receipt.
2. After breaking the seal, keep the products in a plastic bag to shut out ambient air, store them in the same environment as above, and use them up as soon as possible.
3. Do not stack too many switches.