



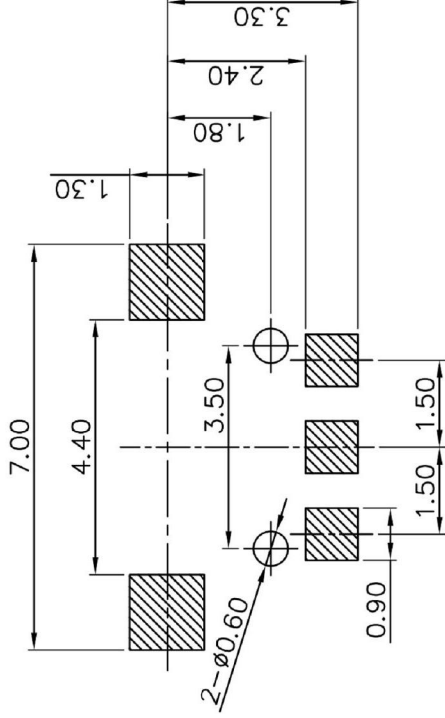
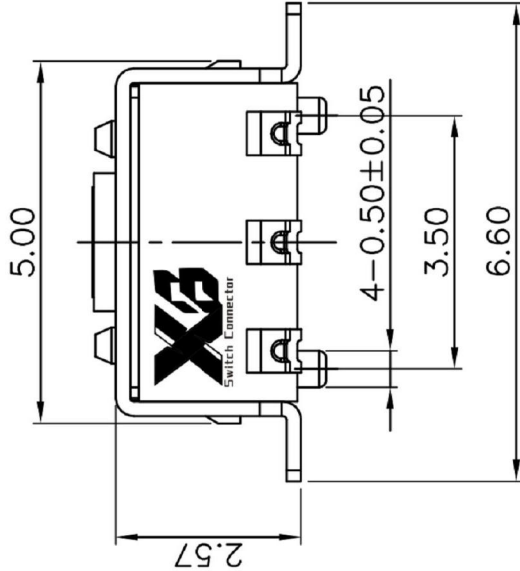
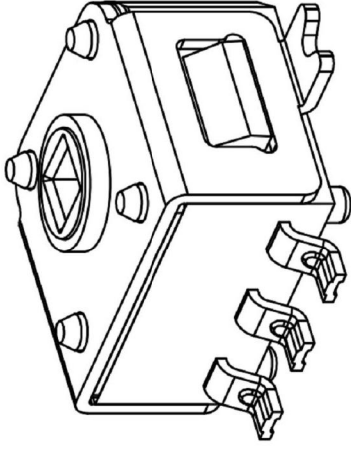
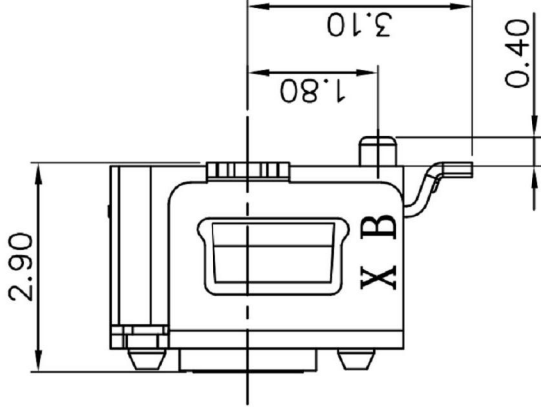
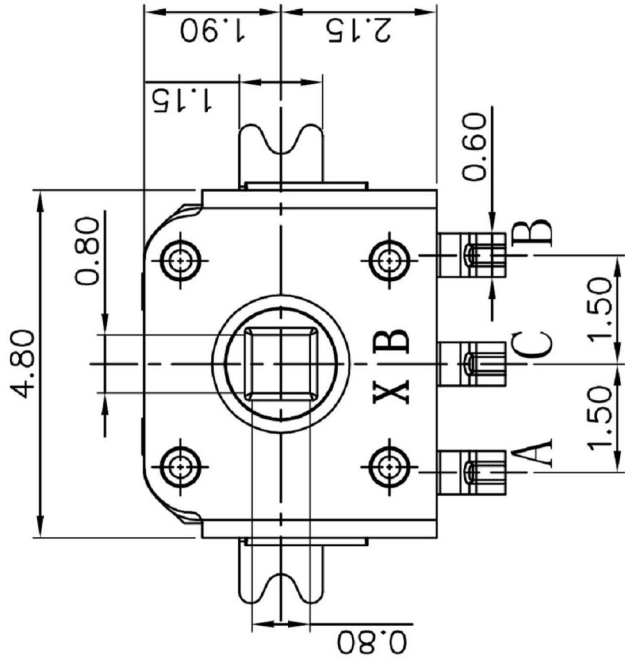
CUSTOMER NAME	客户名称:	
CUSTOMER NO.	客户编号:	
SERIES	系 列:	编码开关旋转式4.8*2.57*4.05mm
MODEL NO.	型 号:	XB-EN-06 series
DRAWING NO.	图 形 号:	Encoding Switch Rotary type

若此产品规格符合贵司要求，敬请确认此规格书内所有项目
并签名和盖章后回传给我司，以作我司产品制作之
依据和存档之用，多谢合作！

APPROVE 接受	NOT APPROVE 不接受
SIGNATURE 签署 STAMP盖章 DATE日期	

PREPARED BY.制表人	CHECKED BY.校对	APPROVED BY.审核	APPROVAL BY.批准
研发部 戴海明 2022.06.08	品质部 黄自清 2022.06.08	工程部 庞军 2022.06.08	总经办 吴量 2022.06.08

MAiL: HK@ALPSR.CN XB@ALPSR.CN XB@ALPSR.COM
Quality core! Afterburner for Made in China!



P. C. B MOUNTING DETAIL

分解能力

CC点数	脉冲数
12	6
12	12

气候等级	额定值	接触电阻	耐压	绝缘电阻	按压力	行程	寿命
Climate grade	Rated values	Contact resistance	Dielectric strength	Insulation resistance	Operating Force	Travel	Life
-30℃~+85℃	Max50 m12W DC Min10 m12W DC	≤50mΩ	100V AC 1Min	≥100MΩ	10gf±5gf	0.15±0.05	100000次



1. 一般事项 General considerations

1-1. 适用规格 Scope

本规格书适用于一般使用的旋转型编码器。

This specification is applied to rotary encoders used for general

1-2. 标准状态 Standard atmospheric conditions

除另有规定外，测量应在以下状态进行：

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as following limits:

温度 Ambient temperature : 5°C to 35°C

相对湿度 Relative humidity : 45% to 85%

气压 Air pressure : 86kpa to 106kpa

1-3. 使用温度范围

Operating temperature range : -40°C to +85°C

1-4. 使用相对湿度

Operating relative humidity : ≤85%RH

2. 构造 Construction

2-1. 尺寸 Dimensions

见所附成品图 Refer to attached drawing

3. 额定值 Rating

3-1. 额定电压

Rated voltage: DC 5V

3-2. 最大额定电流（阻抗负载）

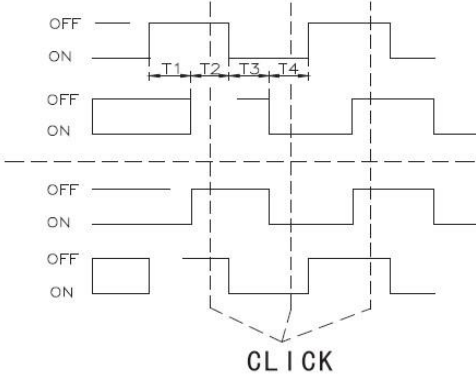
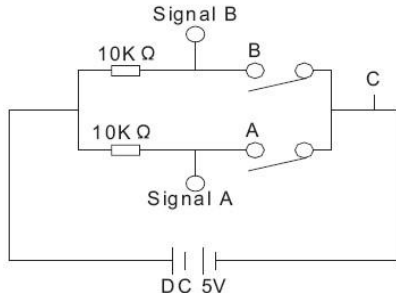
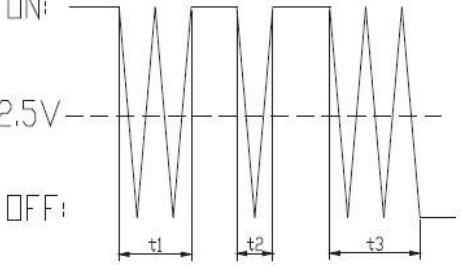
Maximum operating current (resistive load)

各相导线 Each lead: 0.5mA (Max 5mA; Min 0.5mA)

公共导线 Common lead: 1mA (Max 10mA; Min 1.0mA)

4. 电气性能 Electrical properties

项目 ITEM	条件 CONDITIONS	规格 SPECIFICATIONS
4-1 接触电阻 Contact resistance	使用误差小于5%的微电阻测试仪进行测试 Using the micro resistance tester with error less than 5% for testing	≤200mΩ 200mΩ or less
4-2 绝缘阻抗 Insulation resistance	使用绝缘电阻测试仪，设置参数为DC 50V. 测试端子与外壳，端子与端子之间的绝缘阻抗 Using the insulation resistance tester, setting parameters to DC 50V, The insulation resistance between the terminal and the cover, the terminal and the terminal is test.	50MΩ 以上 50MΩ
4-3 耐电压 Withstand voltage	使用耐电压测试仪，设置参数为AC50V, 测试端子和外壳或端子与端子之间的耐电压，时间1分钟 Using the voltage resistance tester, set the parameters to the AC50V, test the voltage resistance between the terminal and cover or terminal and terminal, time is 1 minute.	AC50V测试1分钟，无击穿击穿 AC50V test 1 minute, no dielectric breakdown shall occur

项目 ITEM	条件 CONDITIONS		规格 SPECIFICATIONS
4-4.输出信号 Output signal format	编码器每秒钟转动360度，A、B两信号输出相位差，输出波形详细见图，卡点位置如下图所示（虚线代表带卡点装置上的停靠点位置） The encoder rotates 360 degrees per second,2 Phase-different signals(signal A, signal B)Derails shown in(The broken line shows detent position.)		T1,T2,T3,T4≥4ms
	轴回转方向 Shaft rotational direction	信号 Signal	输出波形 Out put 图4fig. 4
	顺时针方向 C. W	A(A-C端子间) A(TerminalA-C)	
		B(B-C端子间) B(Terminal B-C)	
	逆时针方向 C. C. W	A(A-C端子间) A(TerminalA-C)	
		B(B-C端子间) B(Terminal B-C)	
4-5切换特性 Switching character istics	Chattering 振动 Fig.2 t1,t3 < 3ms	将编码器按图1的线路接在波示器上，编码器每秒钟转动360度，当电路从ON到OFF的瞬间，每次转换，在电压2.5V时，测试电路产生振动的时间 The encoder is connected to the circuit in figure 1,The encoder rotates 360 degrees per second.When the circuit is switched from NO to OFF,At 2.5V voltage,test circuit generates vibration time,when every times.	
			
	Sliding noise (Bounce) 跳动 Fig.2 t2 < 2ms	将编码器按图1的电路接在波示器上，编码器每秒钟转动360度，当电路在ON区域时，测试电路产生跳动的现象。跳动位置的获取应在ON区域，电压在2.5V的位置。在ON区域，电压在2.5V的现象出现2次以上的，被认为是连续跳动。 The encoder is connected ti the circuit in Figure1,The encoder rotates 360 degrees per second,when the circuit in the ON region,test circuit generation time of jitter.Beating position acquisition should be in the ON region,In the ON region,voltage at 2.5V phenomenon occurs more than 2 times,it is considered to be continuous beating.	

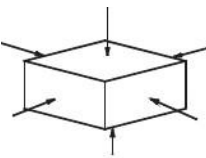


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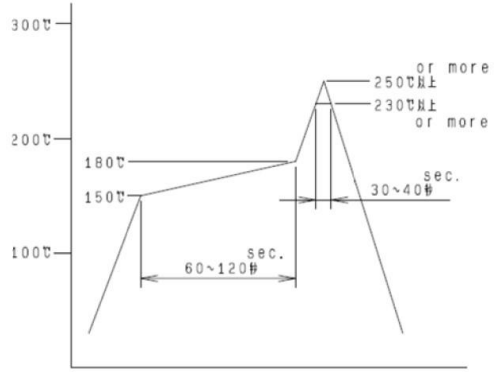
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5.机械性能 Mechanical characteristics

项目 ITEM	条件 CONDITIONS	规格 SPECIFICATIONS
5-1.全回转角度 Total rotational angle	有效回转角度 Angle of effective rotation	360°(无止档点) 360°(Endless)
5-2.回转力矩 Rotational Torque	只适用于附卡点装置 Only suitable for C.C equipment.	8±5gf.cm
5-3.分解能力 Resolution	回转360°的输出脉冲数 Number of pulses in 360° rotation	☐ 6个脉冲/360° 6 pulses/360°
		☐ 12个脉冲/360° 12 pulses/360°
5-4.定位点数及位置 Number and position of deten	只适用于附卡点装置 Only suitable for C.C equipment	☐ 12定位点 12detents
5-5. 端子强度 Terminal strength	任意方向施加1N作用力于接线末端端, 持续时间10s. A static load of 1N shall be applied to the tip of terminals for 10s in any direction.	端子无松动, 损坏及绝缘层的破裂。 电气性能应符合第4项要求。 Shall be free from terminal looseness, damage and insulator breakage. The electrical performance requirements specified shall be satisfied.
5-6.振动 Vibration proof	编码器采用常规的安装方法牢固的安装在试验设备上, 并在下述参数条件下进行试验: (1)振频=10~55Hz (2)振幅1.5mm (3)振动变化速度: 10~55~10Hz大约1分钟 (4)变频方法: 线性型式 (5)振动方向: 三个互相垂直的方向。其中一个方向应是促动元件运动的方向 (6)时间: 每个方向2小时 (共6小时) Encoder shall be secured to a testing machine by a normal mounting device and method. Encoder shall be tested according to the following request" (1)Vibration frequency range=10~55Hz (2)Total amplitude=1.5mm (3)Sweep ratio: 10~55~10Hz Approx 1 min (4) Method of changing the sweep vibration frequency:linear (5)Direction of vibration:Three perpendicular directions including actuating direction. (6)Duration:2 hours (6 hours in total)	实验后: 接触电阻: 5 Ω Max 绝缘电阻: 10M Ω Min 电气性能应符合要求 表面及结构无明显变形 After test Contact resistance:5 Ω Max Insulation resistance: 10M Ω Min The electrical performance requirements specified shall be satisfied. No abnormalities shall be recognized in appearance and construction.

5-7.耐冲击 Mechanical Shock	编码器在下述参数条件下进行试验： (1)安装方法：常规方法 (2)加速度：490 m/s² (50G) (3)时间：11ms (4)实验方向：图示6方向 (5)冲击次数：每个方向3次（总共18次） Encoder shall be tested according to the following request: (1)Mounting Method:Normal (2)Acceleration:490m/s² (50G) (3)Duration:11ms (4)Test Direction:6 directions  (5)Number of shocks:3 times per direction(18 times in total)	实验后： 接触电阻：5 Ω Max 绝缘电阻：10M Ω Min 电气性能应符合要求 表面及结构无明显变形 After test Contact resistance:5 Ω Max Insulation resistance: 10M Ω Min The electrical performance requirements specified shall be satisfied. No abnormalities shall be recognized in appearance and construction.
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6.焊接性能Soldering Characteristics

项目 ITEM	条件 CONDITIONS	规格 SPECIFICATIONS
6-1.可焊性 Solder Ability	编码器在下述参数条件下进行试验： (1)焊料：含银3%以上的锡膏 (2)焊接温度：245℃ Min (3)熔焊时间：3S Min The crucible is tested under the following parameters: (1)solder: tin paste containing more than 3% silver. (2)Welding temperature: 245℃ Min (3)Welding times: 3S Min	熔焊面积应该超过95% Melting surface areashould exceed 95% of the total
6-2.耐焊接热 Solder Heat Resistance	编码器在下述参数条件下进行试验： (1)焊接方式：SMT (2)焊接温度及时间： 自动焊接：250℃以上 3~5S; 230℃以上 30~40S (3)手工焊接：350℃ Max 3s Max The filter is tested under the following parameters: (1)The welding way: SMT (2)Welding temperature and time: Automatic welding: 250℃ above 3~5S; 230℃ above 30~40S (3)Manual welding: 350℃ Max 3s Max 	无外观、溶胶变形不良，扭力衰变Max 10%.电气性能符合第4项 No appearance, sol deformation and other bad, torsion decay Max 10%. Electrical properties in line with item 4



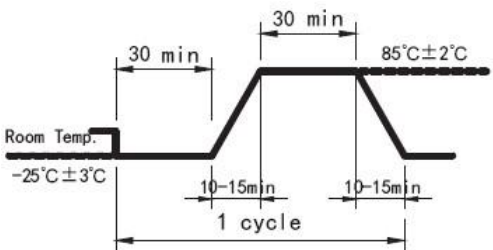
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7.耐久性能 Durability characteristics

项目 ITEM	条件 CONDITIONS	规格 SPECIFICATIONS
7-1.机械寿命 Mechanical Life	在不带负荷的条件下,速度为30次/分钟,在寿命试验设备上连续转换,寿命试验设备工作方式是顺时针方向旋转360度后立即逆时针方向旋转360度进行试验 Under the condition of no load,the speed is 30 times per minute,and the life test equipment is continuous converted on the life test equipment.the working mode of the life test equipment is to rotate 360 degrees counter clockwise immediately after rotating 360 degrees clockwise for the test once.	15,000±500周 15,000±500cycles
		实验后: 接触电阻: 5 Ω Max 绝缘电阻: 10M Ω Min 操作力衰变应在±30%以内 机械性能应符合第5.2, 5.3条的要求 After test Contact resistance:5 Ω Max Insulation resistance: 10M Ω Min The decay of the operating force should be within±30% The electrical performance requirements specified in item 5.2,5.3 shall be satisfied.
7-2.电气寿命 Electronics Life	在带以下负荷的条件下,速度为30次/分钟,在寿命试验设备上连续转换,寿命试验设备的工作方式为:顺时针旋转360度后立即逆时针旋转360度进行试验。 负载:0.1Ma 5VDC Under the condition of the following load,the speed is 30 times/min,and the life test equipment is continuously converted on the life test equipment.the working mode of the life test equipment is to rotate 360 degrees counter clockwise immediately after the clockwise rotating 360 degrees for the test once. Load:0.1Ma 5VDC	15,000±500周 15,000±500cycles
		实验后: 接触电阻: 5 Ω Max 绝缘电阻: 10M Ω Min 无脉冲数增加或减少不良 电气性能应符合第4-4, 4-5条的要求 After test Contact resistance:5 Ω Max Insulation resistance: 10M Ω Min No pulse number increases or decreases badly. Electrical properties shall meet the requirements of Sections 4-4, 4-5
7-3 耐低温 Cold Proof	试件在-40±2℃的温控箱内无工作静态保持240小时,然后在正常温度和湿度下恢复1小时,并在此后1小时内对试品进行测量,水滴应消失 The test piece shall remain free for 240 hours in a temperature control box of -40±2℃, and then recover for 1 hour at normal temperature and humidity.The test piece shall be measured within 1 hour thereafter. The water droplets shall disappear.	实验后: 接触电阻: 5 Ω Max 绝缘电阻: 10M Ω Min 应满足规定的电气性能要求 After test Contact resistance:5 Ω Max Insulation resistance: 10M Ω Min The Electrical performance requirements specified shall be satisfied
7-4 耐高温 Hot Proof	试件在+85±2℃的温控箱内无工作静态保持240小时,然后在正常温度和湿度下恢复1小时,并在此后1小时内对试品进行测量,水滴应消失 The test piece shall remain free for 240 hours in a temperature control box of +85±2℃, and then recover for 1 hour at normal temperature and humidity.The test piece shall be measured within 1 hour thereafter. The water droplets shall disappear.	



7-5.耐湿热 Moisture resistance	试件在$40\pm 2^{\circ}\text{C}$,90~95%RH的温控箱内无工作静态保持240小时,然后在正常温度和湿度下恢复1小时,并在此后1小时内对试品进行测量,水滴应消失 After testing at $40\pm 2^{\circ}\text{C}$,90~95%RH for 240 hours, and then recover for 1 hour at normal temperature and humidity.The test piece shall be measured within 1 hour thereafter. The water droplets shall disappear.	实验后: 接触电阻: $5\ \Omega$ Max 绝缘电阻: $10\text{M}\ \Omega$ Min 电气性能应符合第4-3, 4-5条的要求 After test Contact resistance:$5\ \Omega$ Max Insulation resistance: $10\text{M}\ \Omega$ Min No pulse number increases or decreases badly. Electrical properties shall meet the requirements of Sections 4-3, 4-5
7-6温度转换 Temperature Cycling	试件按下述实验条件试验5次,然后在正常温度和湿度下恢复1小时,并在此后1小时内对试品进行测量,水滴应消失 After 5 cycles of following conditions,the encoder shall be allowed to stand under normal temperature and humidity conditions for 1 hour,and measurement shall be made within 1 hour after that.Water drops shall be eliminated. 	实验后: 接触电阻: $5\ \Omega$ Max 绝缘电阻: $10\text{M}\ \Omega$ Min 电气性能应符合第4-3, 4-5条的要求 After test Contact resistance:$5\ \Omega$ Max Insulation resistance: $10\text{M}\ \Omega$ Min No pulse number increases or decreases badly. Electrical properties shall meet the requirements of Sections 4-3, 4-5
7-7盐雾实验 Salt Mist	试件下述实验后测量: (1)温度: $35\pm 2^{\circ}\text{C}$ (2)盐溶液浓度: $5\pm 1\%$ (品质百分比) (3)盐沉积物用水冲掉 (4)时间: 48小时 The encoder shall be checked after the following test: (1)Temperature: $35\pm 2^{\circ}\text{C}$ (2)Salt Solution: $5\pm 1\%$(Solids by mass) (3)Salt deposit shall be removed by running water. (4)Duration:48 hours	试验干燥后,在金属件上没有影响产品性能的腐蚀斑点,电气性能应符合第4条的要求 After the test is dried,there are no corrosion spots on the metal parts that affect the performance of the product,and the electrical properties should meet the requirements of Article 4
7-8 硫化试验 Vulcanization test	试件下述条件实验: (1)温度: $35\pm 2^{\circ}\text{C}$ (2)硫化钾溶液浓度: 2% (品质百分比) (3)时间: 2分钟 The epecimens were tested under the following conditions: (1)Temperature: $35\pm 2^{\circ}\text{C}$ (2)Potassium sulfide Solution concentration: 2%(mass percentage) (3)Time:2 minutes.	试验干燥后,在金属件上没有影响产品性能的腐蚀斑点,电气性能应符合第4条的要求 After the test is dried,there are no corrosion spots on the metal parts that affect the performance of the product,and the electrical properties should meet the requirements of Article 4



9.环境有害物质管理Management of environmental hazardous substances

本产品符合下方“√”勾选的环境有害物质管理标准。

This product complies with the “√” hook under the environmental hazardous substances management standard selection.

√	本产品符合欧盟ROHS 2.0标准要求
	本产品符合HF标准要求
√	本产品符合REACH标准要求

10. 贮存条件Storage condition

10.1 为防止本产品的性能劣化和耐焊性等性能受到影响，请保管在以下的条件和环境下：

In order to protect the switch performance and the soldering conditions,it should keep the switch under the following conditions:

10.1.1. 温度-30℃到+80℃，湿度85%以下的环境

Temperature of -30℃ to +80℃,with humidity lower than 85%RH;

10.1.2. 避免保存在含有腐蚀性气体的环境中

Avoid storing in the environment containing corrosive gas;

10.1.3. 避免保存在日光能直射的场所

Avoid keeping it in the location with direct sunlight

10.1.4. 在不施加负重外力的包装状态下进行保管

Store using the standard packing without exerting force

10.2. 产品未打开包装的保存标准期限为12个月。打开包装后有剩余产品时，应将剩余部分放入胶袋中包装好，进行防湿和防腐蚀气体等处理后进行保存，保存期限为3个月。

The standard storage period is 12 months before opening the package.Preferably to be used as soon as possible.After opening the package,you should put the remaining switches in a plastic bag to prevent from damp and corrosive gas with maximum up 3 months