



CUSTOMER NAME	客户名称:	
CUSTOMER NO.	客户编号:	
SERIES	系 列:	增量编码开关中心高7mm 9.6*4.2*10.85mm
MODEL NO.	型 号:	XB-EN-12 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！

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!

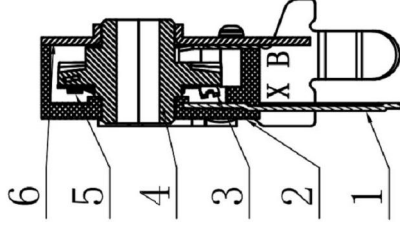
ROHS

Technical drawing of a 12-pulse 24-click rotary switch assembly. The drawing includes multiple views: a top view showing the 7-pin connector and dimensions (9.60±0.15, 3.85, 7.0±0.1, 3.3, 2.50, 2.50, 11.50±0.2, 1.75); a side view showing the shaft hole shape and dimensions (3-1.74±0.03, 4.0, 6-60° ±3°, 3.0); a cross-sectional view showing the internal components (1. Anchor Plate, 2. Spring, 3. Base, 4. Wheel gear, 5. Sheet iron, 6. Cover) and dimensions (4.20, 3.20, 2.0, 2.80, 5.0); and a detail view of the shaft hole shape and dimensions (3-1.74±0.03, 4.0, 6-60° ±3°, 3.0). The drawing also includes a table of dimensions and a table of materials and colors.

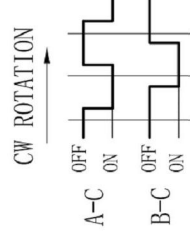
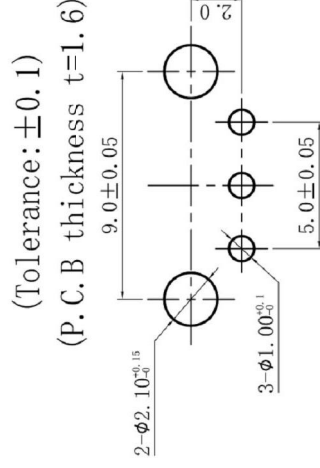
NO.	DESCRIPTION	MATERIAL	COLOR	REMARK
6	Cover	Sheet iron	---	Nickel Plated
5	Anchor Plate	SUS	---	---
4	Wheel gear	POM	Black	---
3	Spring	Copper alloy	---	---
2	Base	PA66	Black	---
1	Terminal	Brass	---	Silver Plated

气候等级 Climate grade	额定值 Rated values	接触电阻 Contact resistance	绝缘电阻 Insulation resistance	耐压 Dielectric strength	接压力 Operating force	行程 Travel	寿命 Life
Max50 ~85℃ Min10 ~-45℃	Max50 m12V DC Min10 m12V DC	≤50mΩ	≥100MΩ	100V.AC, 1Min	10gf±5gf	0.15±0.05	100000次

DRAWN BY: GAO, PENG				DATE: 02/24/23				ENCODER			
CHECKED BY: PANG, DONG				DATE: 02/24/23				MODULE			
APPROVED BY: YANG, JUN				DATE: 02/24/23				DWG NO. XB-EN-12			
SCALE: 1 of 1				SHEET NO. 9. 6x4. 2x10. 85mm				PART NO.			
FINISH				SCALE				MODLE			
MATL				TITLE				增量编码开关 旋转式			
SIZE				A4				VER			
R				J				R			



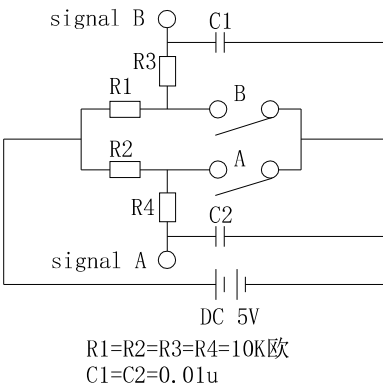
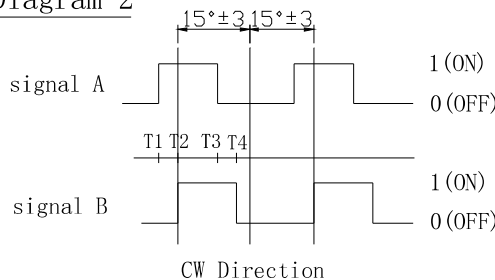
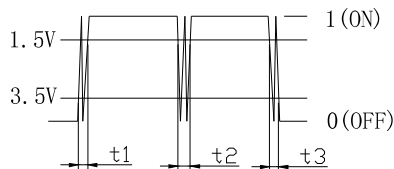
气候等级 Climate grade	额定值 Rated value	接触电阻 Contact resistance	耐压 Dielectric strength	绝缘电阻 Insulation resistance	按压力 Operating force	行程 Travel	寿命 Life
-30℃~+85℃	Max50 mV DC Min10 μA2V DC	≤50mΩ	100V AC 1Min	≥100MΩ	10gf±5gf	0.15±0.05	100000次



12 pulse 24 click

[illegible]

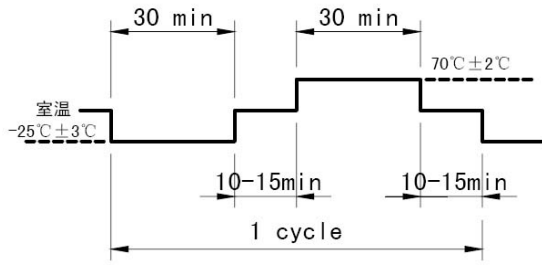
 东莞市溪榜电子有限公司 DONG GUAN XI BANGE ELECTRONICS CO., LTD		文件编号	XB/EN/20240508
		发布日期	2024年5月8日
PRODUCT SPECIFICATION 产品承认书		文件版次	第 A 版第 0 次修订
		页 码	共 5 页 第 1 页
XB-EN SERIES 系列	ENCODER 编码器	产品型号	XB-EN series
1.1 Application: This specification is applied to the miniature quick encoder for general applications. 适用范围：该规格书适用小型数位编码器的一般使用范围。 1.2 Operating Temperature Range: -25℃ to +85℃ 使用温度范围： -25℃ - +85℃ 1.3 Operating Relative Humidity: ≤85% RH 相对湿度： ≤85% RH 1.4 Test Conditions: Unless otherwise specified, the atmospheric conditions for making measurements and tests are as follows: 实验条件：若没有特别说明，则试验大气条件如下： Ambient Temperature: 5-35℃ Relative Humidity: 45-85% RH Air Pressure: 86-106Kpa (860-1060mbar) 环境温度： 5-35℃ 相对湿度： 45-85% RH 大气压力： 86-106Kpa (860-1060mbar)			
2. Appearance, Structure & Dimensions 外观， 结构及尺寸:			
2.1 Appearance: The encoder shall have good finishing, and no rust, crack or plating defects. 外观：产品外观良好，无锈蚀、裂纹和镀层缺陷。 2.2 Structure & Dimensions: Refer to individual product drawing. 结构及尺寸：参见产品图纸 2.3 Markings: Refer to individual product drawing. 标识：参见产品图纸			
3. Ratings 额定值: 1mA. 10VDC (Each bit)			
4. Electrical Characteristics 电气特性			
No.	Item 项目	Criteria 标准	Test Method 实验方法
4.1	Contact Resistance 接触电阻	500mΩ Max.	Measured by a voltage drop method at 1A Max 5VDC. Any equipment with error not more than 5% can be used. Resistance after test is the average of 5 successive measurements. 以1A, 5V 直流电，采用电压降法测量。也可用误差不超过5%的仪表进行测量，实验后的电阻取5 次测量的平均值。
4.2	Insulation Resistance 绝缘电阻	50M Ω Min.	50VDC voltage is applied between each pair of terminals and between the terminal and the metal frame for 60±5s. 在相互绝缘的所有端子之间及各接线端子与外露的非载流金属零件之间加载50V 直流电，持续时间60±5S。
4.3	Dielectric Voltage 抗电强度	No dielectric breakdown shall occur. 无击穿现象发生。	50VAC (50~60Hz,cut -off current 2mA) is applied between non-connected terminals and between terminals and the metal frame for 60 ±5s. 在相互绝缘的所有接线端子之间，各接线端子与外壳或非载流金属零件之间加载 50V（50-60Hz）交流电，持续时间 60±5S。

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PRODUCT SPECIFICATION 产品承认书		文件版次	第 A 版第 0 次修订	
		页 码	共 5 页 第 2 页	
XB-EN SERIES 系列		ENCODER 编码器	产品型号	XB-EN series
4.4	Bouncing 切换特性	Between 3.5V and 1.5V Measurement circuit Diagram 1 Measure condition:360 ° /s for rotational speed t1. t3: 3ms Max. t2: 2ms Max. T1.T2.T3.T4: 4ms Min. 位于 1.5V 和 3.5V 电压下测定电路如图解1 测量条件：旋转速度 360° /s t1. t3 : 3ms Max. t2 : 2msMax. T1.T2.T3.T4 : 4ms Min.	Diagram 1  R1=R2=R3=R4=10KΩ C1=C2=0.01u	
			Diagram 2  15°±3 15°±3 signal A 1 (ON) 0 (OFF) T1 T2 T3 T4 signal B 1 (ON) 0 (OFF) CW Direction	
			Diagram 3  1.5V 1 (ON) 3.5V 0 (OFF) t1 t2 t3	

5.Mechanical Characteristics 机械特性：			
No.	Item 项目	Criteria 标准	Test Method 实验方法
5.1	Detent points 执子点数及位置	24 detent points (each detent angle:15° ±3° 24 点执子每点角度：15° ±3°	
5.2	Output resolution 分解能	12 pulse / 360° 各相12 脉波/360°	
5.3	Operating Force 操作力	10±5gf.cm.	Apply a tension meter on the midpoint of the actuator (or tip of the shaft) to supply a pressure vertically from its free position to operating position. 在操作元件末端沿操作方向均匀施加静载荷，使操作元件转换到动作位置。

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PRODUCT SPECIFICATION 产品承认书		文件版次	第 A 版第 0 次修订	
		页 码	共 5 页 第 3 页	
XB-EN SERIES 系列		ENCODER 编码器	产品型号	XB-EN series
No.	Item 项目	Criteria 标准	Test Method 实验方法	
5.4	Vibration Proof 振动	After test, Contact resistance:10 Ω Max. Insulation resistance:10M Ω Min No abnormalities shall be recognized in appearance and construction. 实验后：接触电阻：10 Ω Max. 绝缘电阻：10M Ω Min. 表面及结构无明显变形。	Encoder shall be secured to a testing machine by a normal mounting device and method. Encoder shall be measured after following test. (1) Vibration frequency range = 10~55 Hz (2) Total amplitude =1.5mm (3) Sweep ratio: 10~55~10Hz Approx. 1 min (4) Method of changing the sweep vibration frequency: logarithmic or linear (5) Direction of vibration: Three perpendicular directions including actuating direction. (6) Duration: 2 hours (6 hours in total) 开关采用常规的安装方法牢固地安装在试验设备上，并在下述参数条件下进行试验：(1) 振频=10~55Hz (2) 振幅1.5mm (3) 振动变化速率：10~55~10Hz 大约1 分钟(4) 变频方法：对数或线性型式(5) 振动方向：三个相互垂直的方向，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）。	
5.5	Mechanical Shock 冲击	Shall be free from mechanical abnormalities. 表面及结构无明显变形。	Mount the product to P.C.B. and apply static force of 10gf.cm.Min. Second as shown in the “F”. 试件焊接于P.C.B. 施加静载荷10gf.cm.Min. “F”如图所示： 参见产品图纸	
5.6	Solder Ability 可焊性	More than 80% of immersed part shall be covered with solder. 超过80%的浸锡面积被焊料所覆盖。	Encoder shall be checked after following test: (1) Solder: H63A (2) Flux: Rosin Flux having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol solution. (3) Soldering Temperature: 260 ± 5° C Immersing Time: 3 ± 1s Flux immersing time shall be 5 ~10s in normal room temperature. (4) Immersion Depth: Immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) 试件在下述参数条件下进行试验： (1) 焊料：H63A (2) 焊剂：焊剂，质量百分比为25%松香，75%甲醇的无色透明溶液。 (3) 焊接温度：260±5℃ 浸渍时间：3±1s 焊剂浸渍时间：5~10s (4) 浸渍深度：接线端应浸到离开关根部1.6mm 处。	

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PRODUCT SPECIFICATION 产品承认书		文件版次	第 A 版第 0 次修订
		页 码	共 5 页 第 4 页
XB-EN SERIES 系列	ENCODER 编码器		产品型号 XB-EN series
No.	Item 项目	Criteria 标准	Test Method 实验方法
5.7	Solder Heat Resistance 耐焊接热	No abnormalities shall be observed in appearance and operation. 无外观及功能损坏。	Encoder shall be measured after following test: (1) Solder: H63A (2)Flux: Rosin Flux having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol solution. (3) Soldering Temperature & Immersing Time Dip Soldering 260±5° C 3-5s Manual Soldering 350±5° C 2~3s (4)Immersion Depth: (For Dip Soldering) Immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) 试件在下述参数条件下进行试验: (1) 焊料: H63A (2) 焊剂: 焊剂, 质量百分比为25%松香, 75%甲醇的无色透明溶液。 (3) 焊接温度及浸渍时间: 自动焊接260± 5℃ 3-5s 手工焊接 350±5℃ 2~3s (4) 浸渍深度: (对于手动焊接) 接线端应浸到离开1.6mm 处。
6. Durability characteristics 耐用性能			
No.	Item 项目	Criteria 标准	Test Method 实验方法
6.1	Mechanical Life 机械寿命	After test, Contact resistance: 10 Ω Max. Insulation resistance:10M Ω Min. The encoder shall be free from abnormalities in appearance construction. 实验后: 接 触 电 阻 :10 Ω Max. 绝 缘 电 阻 :10M Ω Min. 开关外观及结构应无损坏。	100,000 cycles of operation shall be performed continuously at a rate of 30 cycles per minute without load. 在不带负荷的条件下, 速度为 30 次/分, 在寿命试验设备上连续转换 100,000 次。

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PRODUCT SPECIFICATION 产品承认书		文件版次	第 A 版第 0 次修订
		页 码	共 5 页 第 5 页
XB-EN SERIES 系列	ENCODER 编码器	产品型号	XB-EN series
7. Weather Proof Characteristics 耐候性能:			
No.	Item 项目	Criteria 标准	Test Method 实验方法
7.1	Cold Proof 低温	After test, Contact resistance:10 Ω Max. Insulation resistance: 10M Ω Min.	After testing at $-25 \pm 2^{\circ}\text{C}$ for 48 hours, 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. 试件在 $-25 \pm 2^{\circ}\text{C}$ 的温控箱内保持48 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。
7.2	Hot Proof 高温	The Encoder shall be free from abnormalities in appearance and construction.	After testing at $85 \pm 2^{\circ}\text{C}$ for 48 hours, 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. 试件在 $85 \pm 2^{\circ}\text{C}$ 的温控箱内保持48 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。
7.3	Moisture Resistance 恒定湿热	实验后: 接触电阻: 10 Ω Max. 绝缘电阻: 10M Ω Min. 开关外观及结构应无损坏。	After testing at $40 \pm 2^{\circ}\text{C}$, 90~95% RH for 48 hours, 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. 试件在 $40 \pm 2^{\circ}\text{C}$, 90-95%RH 的温控箱内保持48 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。
7.4	Temperature Cycling 温度转换	After test, Contact resistance: 10 Ω Max. Insulation resistance:10M Ω Min. The encoder shall be free from abnormalities in appearance and construction. 实验后: 接触电阻: 10 Ω Max. 绝缘电阻: 10M Ω Min. 开关外观及结构应无损坏。	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. 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。 
7.5	Salt Mist 盐雾实验	No remarkable corrosion shall be recognized in metal part. 在金属件上没有腐蚀斑点。	The encoder shall be checked after following test: (1) Temperature: $35 \pm 2^{\circ}\text{C}$ (2) Salt Solution: $5 \pm 1\%$ (Solids by mass) (3) Duration: 8 hour 试件在下述实验后测量: (1) 温度: $35 \pm 2^{\circ}\text{C}$ (2) 盐溶液浓度: $5 \pm 1\%$ (质量百分比) (3) 时间: 8 小时