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承认书 编号	FS-WI-SP-700	发行 日期	20190517
版次	A/1	总页数	10



产 品 承 认 书

Specification for Approval

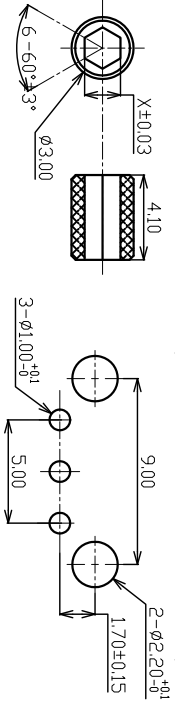
客户名称 Customer		客户代码	FC015
客户部件料号 Customer Part No.			
产品型号 Product Model	Encoder		
F-SWITCH 料号 Company Part No.	E10A2-5C20-12B35		
产 品 规 格 Prduct SPEC.	防尘全通轴编码器，H=5mm；黑芯孔径 1.74mm； 扭力 20±8 克；寿命 30 万次，黑色底座。		

客户确认 Customer confirmation	
采购 Purchase	
品管 Quality	
工程 Engineer	
客户签署（盖章） Sign for Customer Approved 确认日期：_____	

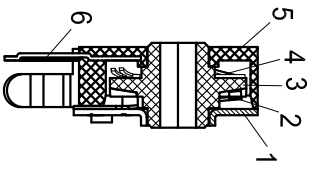
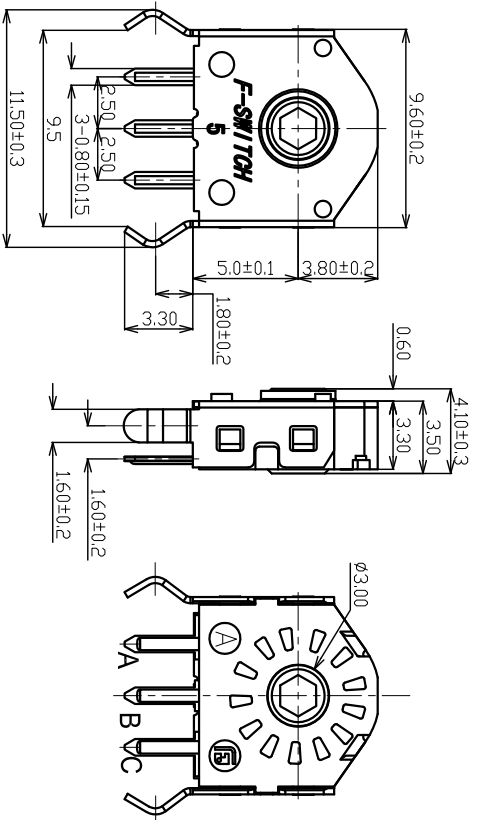
公司确认 Company confirmation	
制作 Prepared by	
工程 Engineer	
批准 Approved by	
F-SWITCH 公司签署（盖章） Sign for Company Approved 确认日期：_____	

Index: P1: Specification drawing; P2-P10: Specification; P11:Paking drawing
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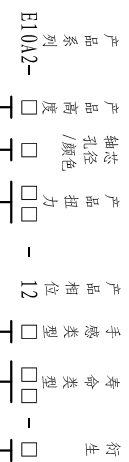
Shaft hole shape
and dimension



(Tolerance: ±0.1)
(P.C.B thickness t=1.6)



注: 本图对应料为:
E10A2-5C20-12B35



35: 30万次 (黑座)
55: 50万次 (灰座)
10: 100万次 (咖啡座)

A: 强手感
B: 标准手感
C: 弱手感

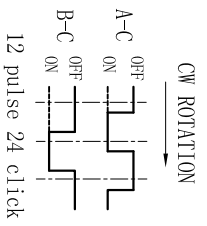
X尺寸规格:
5: 产品高度为5.1mm
5.5: 产品高度为5.5mm
7: 产品高度为7mm
8: 产品高度为8mm
9: 产品高度为9mm
9.75: 产品高度为9.75mm
10: 产品高度为10mm
11: 产品高度为11mm
12: 产品高度为12mm
12.6: 产品高度为12.6mm
13: 产品高度为13mm
14: 产品高度为14mm

1. Material list

ITEM	DESCRIPTION	MATERIAL
1	Cover	Sheet iron
2	Anchor Plate	Stainless Steel Strips
3	Wheel gear	Polyformaldehyde
4	Spring	Copper alloy
5	Base	Polyamide
6	Terminal	Copper alloy

2.CHARACTERISTICS

Rating	1mA 5VDC
Contact Resistance	500mΩ Max
Insulation Resistance	>50MΩ DC/100V
Withstand Voltage	AC/100V 1min.
Wave welding Temper.	245±5℃ 3s max
Ambient Temper. Used	-25℃ to +85℃
Ambient Humidity Used	≤85% at +40℃



F-SWITCH ELECTRONICS CO.,LTD.

ENCODER
见上表

名称 TITLE	料号 PART NO.	料号 DRAWING NO.
ENCODER	FSE10-WI-DR-047	

修改 MODIFY	名称 TITLE	料号 PART NO.	料号 DRAWING NO.

单位 GENERAL	公差 TOLERANCE	mm	设计 DESIGN	审核 CHECK	核准 APPD.
.X±0.5	X.° ±5°		R&D 2019.05.17 陈列	R&D 2019.05.17 陈列	黄炎 2019.05.17 黄炎
.XX±0.3	.X° ±2°				
.XXX±0.1					
表面处理 SURFACE			比例 SCALE 5:1	图幅 SIZE A4	版本 REV. A2
			角注 P.R.O.I.	张数 SHEET 1/1	图类 TYPE 成品图



丰实卫奇电子科技有限公司

F-SWITCH ELECTRONICS CO., LTD.

产 品 承 认 书 PRODUCT SPECIFICATION	承认书编号 (SPC. No.)	FS-WI-SP-700	页码 PAGE	2/9
	产品型号 MODEL	Encoder	版本 Edition	A1
	产品编码 PART NO.	E10A2-5C20-12B35		

1. General Characteristics 一般特性:

- 1.1 Application: This specification is applied to rotary encoder used for general application.
适用范围: 该承认书适用于旋转编码开关的一般使用范围。
- 1.2 Operating Temperature Range: -25°C to $+85^{\circ}\text{C}$
使用温度范围: -25°C to $+85^{\circ}\text{C}$
- 1.3 Operating Relative Humidity: $\leq 85\%$ RH
相对湿度: $\leq 85\%$ 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:
- | | |
|--------------------------|--------------------------|
| Environment Temperature: | 5~35°C |
| 环境温度: | 5~35°C |
| Relative Humidity: | 45~85% |
| 相对湿度: | 45~85% |
| Atmospheric Pressure: | 86~106Kpa (860~1060mbar) |
| 大气压力: | 86~106Kpa (860~1060mbar) |

2. Appearance, Structure and Dimensions 外观, 结构及尺寸:

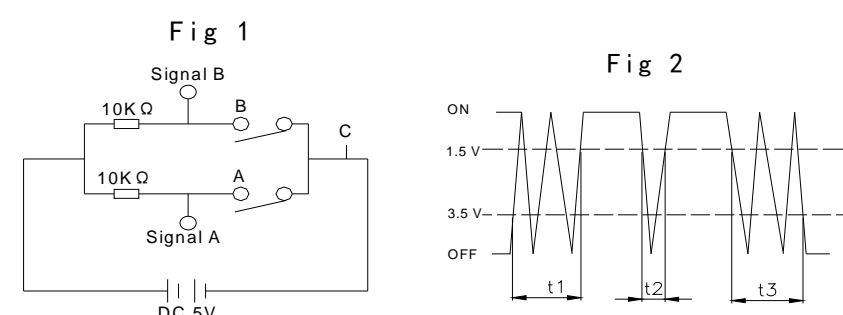
- 2.1 Appearance: The encoder shall have good finishing, and no rust, crack or plating defects.
外观: 产品外观良好, 无锈蚀、裂纹和镀层缺陷。
- 2.2 Structure & Dimensions: Refer to individual product drawing.
结构及尺寸: 参见产品图纸
- 2.3 Markings: Refer to individual product drawing.
标识: 参见产品图纸。

3. Ratings 额定负荷: 参见图纸规格表 (See drawing specification list)

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.	Using the micro resistance tester with error less than 5% for testing. 使用误差小于5%的微电阻测试仪进行测试。
4.2	Insulation Resistance 绝缘电阻	50MΩ Min.	Using the insulation resistance tester, setting parameters to DC100V, The insulation resistance between the terminal and the cover, the terminal and the terminal is test, time is 60 seconds. 使用绝缘电阻测试仪, 设置参数为DC100V, 测试端子与外壳, 端子与端子之间的绝缘阻抗, 时间 60s
4.3	Dielectric Voltage 抗电强度	Nodielectric breakdown shall occur. 无击穿现象发生。	Using the voltage resistance tester, set the parameters to the AC100V, test the voltage resistance between the terminal and cover or terminal and terminal, time is 60s. 使用耐电压测试仪, 设置参数为AC100V, 测试端子和外壳或端子与端子之间的耐电压、时间 60s。

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No.	Item 项目	Tandard 标准	Test Method 测试方法
4.4	Output signal format 输出信号	T1, T2, T3, T4 ≥ 4ms	2 Phase-different signals (signalA, signalB) Derails shown in (The broken line shows detent position.) 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（虚线表示带卡点装置的上擎子处位置）
		Shaft rotational direction 轴回转方向	Signal (Between terminals) 信号(端子之间)
		C. W.	A (A~C) B (B~C)
		C. C. W.	A (A~C) B (B~C)
4.5	Switching characteristics 切换特性	Chattering 振动 Fig. 2 t1, t3 < 3ms	<p>The encoder is connected to the circuit in Figure 1. The encoder rotates 360 degrees per second. When the circuit is switched from ON to OFF (i.e. from high voltage 3.5V to low voltage 1.5V), test circuit generates vibration time, when every times.</p> <p>将编码器按图1的电路接在示波器上，编码器每秒钟转动360度，当电路从ON到OFF的瞬间（即从高电压3.5V转换到低电压1.5V时），每次转换时，测试电路产生振动的时间。</p> <div style="text-align: center;">  <p>Fig 1: Circuit diagram showing a 5V DC source connected to a switch with terminals A and B. Two 10KΩ resistors are connected to terminals A and B. Signal A and Signal B are taken from the resistors. Terminal C is also shown.</p> <p>Fig 2: Waveform showing voltage levels ON (1.5V), 3.5V, and OFF. It illustrates the time intervals t1, t2, and t3 for chattering during transitions.</p> </div>
		Sliding noise (Bounce) 跳动 Fig. 2 t2 < 2ms	<p>The encoder is connected to the circuit in Figure 1. 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 of voltage change more than 1.5V voltage position. In the ON region, In the ON region, the voltage change more than 1.5V phenomenon occurs more than 2 times, it is considered to be continuous beating.</p> <p>将编码器按图1的电路接在示波器上，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的时间。跳动位置的获取应在ON区域，电压变化超过1.5V电压的位置。在ON区域，电压变化超过1.5V的现象出现2次以上的，被认为是连续跳动。</p>



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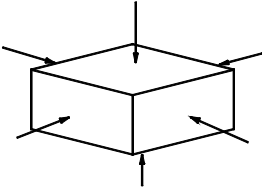
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5. Mechanical Characteristics 机械特性

No.	Item 项目	tandard 标准	Test Method 测试方法
5.1	Detent points 执子点数与位置	24 detent points each detent angle: $15^{\circ} \pm 3^{\circ}$ 24点执子 每点角度: $15^{\circ} \pm 3^{\circ}$	
5.2	Output waves 输出波形数	12pulse/360° 12脉波/360°	
5.3	Rotational force 旋转力矩	Reference spec drawing sheet 参见图纸	The test head is inserted into the rotating shaft , rotates according to the rotation direction of the shaft, and the experiment is carried out with the uniform rotation force. 把测试头插入转轴中, 沿轴的转动方向, 使用均匀的旋转 力进行测试。
5.4	Shaft play in axial direction 轴向摆动	Shall be free from terminal looseness, damage and insulator breakage. The electrical performance requirements specified shall be satisfied. 端子无松动, 损坏及绝缘层 的破裂。 电气性能应符合要求。	The encoder is welded on the printed circuit board, according to the vertical direction of the shaft, and apply $F \times L = 50mN.m$ rotating force , times is 5s. 该编码器焊接在印刷电路板上, 根据轴的垂直方向, 并施 加 $F \times L = 50mN.m$ 旋转力, 时间 5s。
5.5	Terminal Strength 端子强度	Shall be free from terminal looseness, damage and insulator breakage. The electrical performance requirements specified shall be satisfied. 端子无松动, 损坏及绝缘层 的破裂。 电气性能应符合要求。	A static load of 3N shall be applied to the tip of terminals for 10s in any direction. 任意方向施加 3N 作用力于接线端末端, 持续时间 10s。

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No.	Item 项目	standard 标准	Test Method 测试方法
5.6	Vibration Proof 振动	<p>After test, Contact resistance: 5 Ω Max. Insulation resistance: 10MΩ Min. The electrical performance requirements specified shall be satisfied. No abnormalities shall be recognized in appearance and construction.</p> <p>实验后: 接触电阻: 5Ω Max. 绝缘电阻: 10MΩ Min. 电气性能应符合要求。 表面及结构无明显变形。</p>	<p>Encoder shall be secured to a testing machine by a normal mounting device and method. Encoder shall be tested according to the following request:: Vibration frequency range = 10~55 Hz Total amplitude = 1.5mm Sweep ratio: 10~55~10Hz Approx. 1 min Method of changing the sweep vibration frequency: linear Direction of vibration: Three perpendicular directions including actuating direction. (6) Duration: 2 hours (6 hours in total)</p> <p>编码器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: 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)。</p>
5.7	Mechanical Shock 冲击	<p>After test, Contact resistance: 5 Ω Max. Insulation resistance: 10MΩ Min. The Electrical performance requirements specified shall be satisfied. Shall be free from mechanical abnormalities.</p> <p>实验后: 接触电阻: 5Ω Max. 绝缘电阻: 10MΩ Min. 电气性能应符合要求。 表面无变形且操作无异常。</p>	<p>Encoder shall be tested according to the following request: Mounting Method: Normal Acceleration: 490m/s² (50G) Duration: 11ms Test Direction: 6 directions</p> <div style="text-align: center;">  </div> <p>(5) Number of shocks: 3 times per direction (18 times in total) 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: 490m/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)</p>



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6. Soldering Characteristics 焊接性能

No.	Item 项目	tandard 标准	Test Method 测试方法
6.1	Solder Ability 可焊性	Dip area should be more than 85% 浸锡面积应该超过 85%	<p>Encoder shall be tested according to the following request:</p> <p>Solder: Normal</p> <p>Flux: Rosin Flux having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol solution.</p> <p>Soldering Temperature: $260 \pm 5^{\circ} \text{C}$</p> <p>Immersing Time: $3 \pm 1\text{s}$</p> <p>Flux immersing time shall be 5 ~10s in normal room temperature.</p> <p>Immersion Depth:</p> <p>Immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm)</p> <p>编码器在下述参数条件下进行试验:</p> <p>(1) 焊料: 常规</p> <p>(2) 焊剂: 焊剂, 质量百分比为 25%松香, 75%甲醇的无色透明溶液。</p> <p>(3) 焊接温度: $260 \pm 5^{\circ} \text{C}$ 浸渍时间: $3 \pm 1\text{s}$ 焊剂浸渍时间: 5-10s</p> <p>(4) 浸渍深度: 接线端应浸到离开根部 1.6mm 处。</p>
6.2	Solder Heat Resistance 耐焊接热	No abnormalities shall be observed in appearance and operation. 无外观及功能损坏。	<p>Encoder shall be tested according to the following request:</p> <p>Solder: Normal</p> <p>Flux: Rosin Flux having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol solution.</p> <p>Soldering Temperature & Immersing Time</p> <p>Dip Soldering $260 \pm 5^{\circ} \text{C}$ $5 \pm 1\text{s}$</p> <p>Manual Soldering $330 \pm 10^{\circ} \text{C}$ $1 \sim 2\text{s}$</p> <p>(4) Immersion Depth: (For Dip Soldering) Immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm)</p> <p>编码器在下述参数条件下进行试验:</p> <p>(1) 焊料: 常规</p> <p>(2) 焊剂: 焊剂, 质量百分比为 25%松香, 75%甲醇的无色透明溶液。</p> <p>(3) 焊接温度及浸渍时间:</p> <p>自动焊接 $260 \pm 5^{\circ} \text{C}$ $5 \pm 1\text{s}$</p> <p>手工焊接 $330 \pm 10^{\circ} \text{C}$ $1 \sim 2\text{s}$</p> <p>(4) 浸渍深度: (对于手动焊接) 接线端应浸到离开根部 1.6mm 处。</p>

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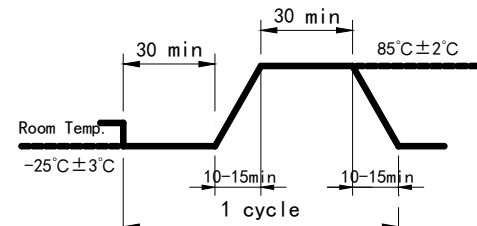
7. Durability characteristics 耐久性能

No.	Item 项目	tandard 标准	Test Method 测试方法
7.1	Mechanical Life 机械寿命	After test Contact resistance: 10Ω Max. Insulation resistance:10MΩ Min. The decay of the operating force should be within + 30%. The electrical performance requirements specified shall be satisfied.	Operation shall be performed continuously at a rate of 30 cycles per minute without load, (Cycles reference drawing) 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, (次数参见图纸)
7.2	Electronics Life 电气寿命	实验后: 接触电阻: 10Ω Max. 绝缘电阻: 10MΩ Min. 操作力衰变应在±30%以内。 电气性能应符合要求。	Operation shall be performed continuously at a rate of 30 cycles per minute load as follow, (Cycles reference drawing) 0.5mA 5VDC 在带以下负荷的条件下, 速度为 30 次/分, 在寿命试验设备上连续转换(次数参见图纸) 0.5mA 5VDC

8. Weather Proof Characteristics 耐候性能:

8.1	Cold Proof 低温	After test, Contact resistance: 5ΩMax. Insulation resistance: 10MΩ Min. The Electrical performance requirements specified shall be satisfied.	After testing at $-25 \pm 2^{\circ} \text{C}$ for 96 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 96 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。
8.2	Hot Proof 高温	实验后: 接触电阻: 5Ω Max. 绝缘电阻: 10MΩ Min. 电气性能应符合要求。	After testing at $85 \pm 2^{\circ} \text{C}$ for 96 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 96 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。

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No.	Item 项目	standard 标准	Test Method 测试方法
8.3	Moisture Resistance 恒定湿热	After test, Contact resistance: 5Ω Max. Insulation resistance: 10MΩ Min. The Electrical performance requirements specified shall be satisfied. 实验后: 接触电阻: 5Ω Max. 绝缘电阻: 10MΩ Min. 电气性能应符合要求。	After testing at 40±2° C, 90~95% RH for 96 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±2°C, 90~95%RH 的温控箱内保持 96 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。
8.4	Temperature Cycling 温度转换	After test, Contact resistance: 5Ω Max. Insulation resistance: 10MΩ Min. The electrical performance requirements specified shall be satisfied. 实验后: 接触电阻: 5Ω Max. 绝缘电阻: 10MΩ Min. 电气性能应符合要求。	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。 
8.5	Salt Mist 盐雾实验	No remarkable corrosion effecting product function shall be recognized in metal part. 在金属件上没有影响产品性能的腐蚀斑点。	The encoder shall be checked after the following test: Temperature: 35±2° C Salt Solution: 5±1% (Solids by mass). Salt deposit shall be removed by running water. (4) Duration: 24 hours 试件在下述实验后测量: (1) 温度: 35±2°C (2) 盐溶液浓度: 5±1% (质量百分比)。 (3) 盐沉积物用水冲掉。 (4) 时间: 24 小时



丰实卫奇电子科技有限公司

F-SWITCH ELECTRONICS CO., LTD.

产 品 承 认 书 PRODUCT SPECIFICATION	承认书编号 (SPC. No.)	FS-WI-SP-700	页码 PAGE	9/9
	产品型号 MODEL	Encoder	版本 Edition	A1
	产品编码 PART NO.	E10A2-5C20-12B35		

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

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

本产品符合下方“√”勾选的环境有害物质管理标准。

√	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. Storage condition 贮存条件:

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

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:

10.1.1. Temperature of -20°C to $+80^{\circ}\text{C}$, with humidity lower than 85%RH;

温度 -20°C 以上, $+80^{\circ}\text{C}$ 以下, 湿度85% 以下的环境。

10.1.2. Avoid storing in the environment containing corrosive gas;

避免保存在含有腐蚀性气体等的空气中。

10.1.3. Avoid keeping it in the location with direct sunlight.

避免保存在日光能直射的场所。

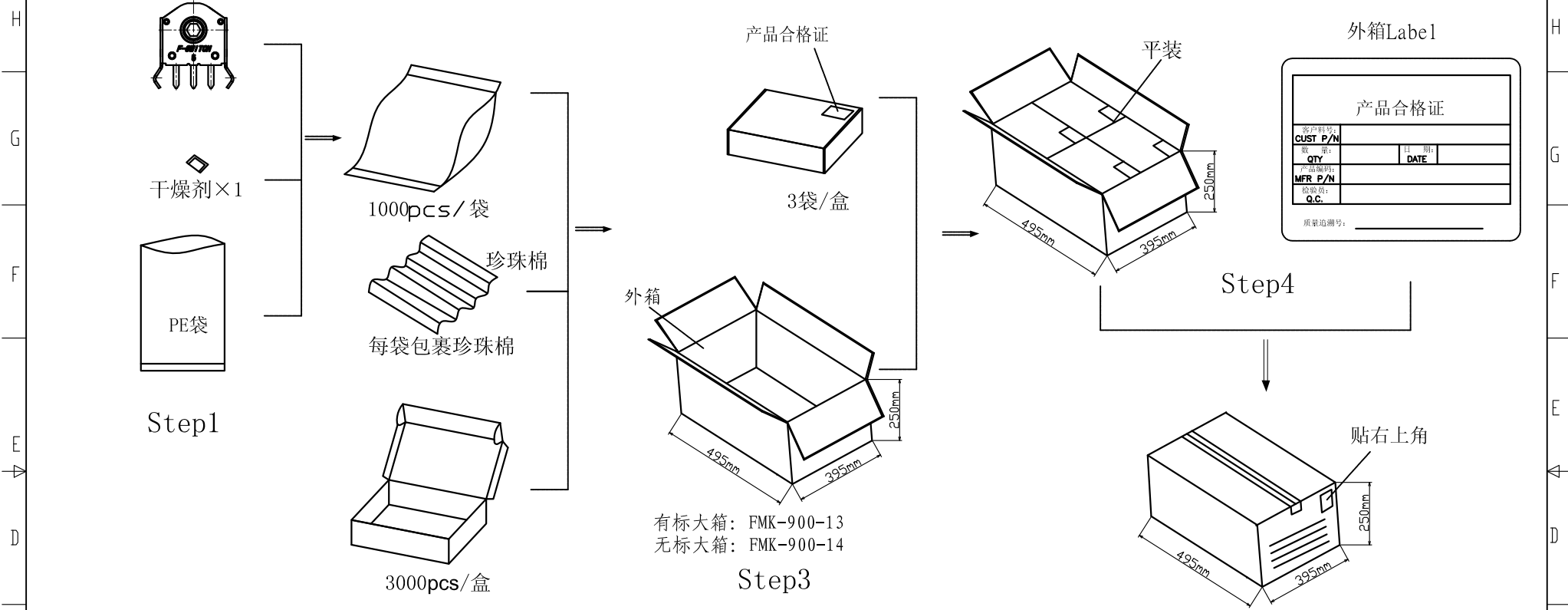
10.1.4. Store using the standard packing without exerting force.

在不施加负重外力的包装状态下进行保管。

10.2 The standard storage period is 6 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 to 3 months.

产品未打开包装的保存标准期限为 6 个月。打开包装后有剩余品时, 应将剩余部分以胶袋包装好以同外界隔离, 请进行合适的防湿, 防腐蚀气体等处理后进行保管, 保存期限为 3 个月。

10 9 8 7 6 5 4 3 2 1



外箱Label

产品合格证	
客户料号: CUST P/N	
数量: QTY	日期: DATE
产品编号: MFR P/N	
检验员: Q.C.	
质量追溯号: _____	

包装要求:

1. 每一袋装规定数量的成品, 装入一包干燥剂;
2. 每盒装按规定数量装入封装好胶袋的产品, 并用珍珠棉包好;
3. 在每盒的右上角, 贴上内盒标签; 然后装入大箱;
4. 装箱时, 大箱装12盒, 小箱装6盒, 须平装以防止压坏。
5. 将装好的包装箱, 用胶带封好, 在大箱两侧填写好产品标识信息, 然后在大箱右上角贴上产品标签, 然后入库等待出货。

A			修改 MODIFY	F-SWITCH ELECTRONICS CO., LTD.			单位 UNIT	mm	设计 DSGD.	审核 CHKD.	核准 APPD.
							一般公差 GENERAL TOLERANCE				
				名称 TITLE	E10A2-5/5.5包装图	材质 MATERIAL	.X ± 0.50	X.° ± 5°			
				料号 PART NO.	/	体积 VOLUME	.XX ± 0.3	.X° ± 2°			
			图号 DRAWING NO.	FSE10-WI-PK-004	重量 WEIGHT	.XXX ± 0.1		比例 SCALE	1.3:1	图幅 SIZE	A4
	VER.					表面 SURFACE		角法 P R O J.		张数 SHEET	1/1

10 9 8 7 6 5 4 3 2 1