

APPROVAL SPECIFICATIONS

CUSTOMER	CUSTOMER'S P/N	GYE'S P/N	PRODUCT	REVISION
		按键开关	TACT SWITCH	A

1、 概述
GENERAL

1.2 适用范围
APPLICATION
此规格书适用于机械式轻触开关的相关要求
This specification is applied to the requirements for TACTILE SWITCH (MECHANICAL CONTACT)

1.3 工作温度范围
Operating Temperature Range
-10℃~70℃(在标准大气压、标准湿度条件下)
-10℃~70℃ (Normal humidity, normal air pressure)

1.4 贮藏温度范围
Storage Temperature Range
-40℃~85℃(在标准大气压、标准湿度条件下)
-40℃~85℃ (Normal humidity, normal air pressure)

1.5 测试条件
Test Conditions
在没有其它特定的条件下，应该在以下的条件下进行测试和测量：
Unless otherwise specified, tests and measurement shall be made in the following standard conditions:
常温.....5℃~35℃
Normal temperature.....5℃~35℃
标准湿度.....相对湿度 45%~85%
Normal humidity.....relative humidity 45%~85%
标准大气压.....86KPa~106Kpa
Normal air pressure.....86Kpa~106Kpa
在制造过程中，测试和测量应该在以下的条件下进行：
If any doubt arise from the judgment, tests shall be conducted at the following conditions:
温度.....20℃±2℃
Temperature.....20℃±2℃
相对湿度.....65%±5%
Relative humidity.....65%±5%
环境气压.....86KPa~106Kpa
Air pressure.....86KPa~106Kpa

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2、 详细说明

Detailed specification

2.1 外观：应无影响、降低产品性能的缺陷；

Appearance: There should be no defects that affect the serviceability of product.

2.2 结构尺寸和安装尺寸：应符合装配图要求；

Style and dimension: shall conform to the assemble drawings.

2.3 操作形式：有触觉反应的操作

Type of actuating: Tactile feedback.

2.4 开关结构：双回路双输出(具体的触点结构在装配图中已绘出)；

Contact arrangement: 2 pole, 2 throw

(Details of contact arrangement are given in the assembly drawings.)

2.5 功率：50uA 3V DC~ 0.3A 14V DC (有效值)

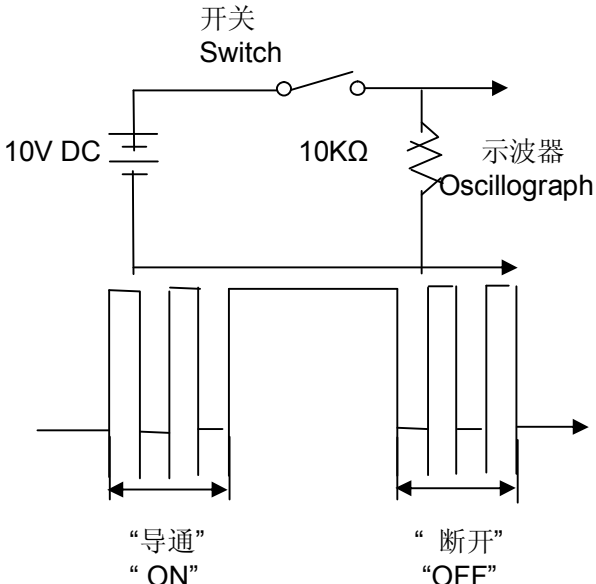
rating: 50uA 3V DC~ 0.3A 14V DC (effective value)

3. 电气性能：

ELECTRICAL SPECIFICATION

项 目	ITEM	试 验 条 件	要 求
		TEST CONDITIONS	REQUIREMENTS
1	接触电阻 Contact Resistance	在不低于 1KHz 的交流电源的电路中，以一个等于 2 倍按力的静负荷施加于按钮中心 Applying a static load of 2 times operating force to the center of the button, measurements shall be more than 1KHZ AC small-current contact resistance meter.	100mΩ . max
2	绝缘电阻 Insulation Resistance	在端子之间施加 DC 500V /1min 的条件下,测量端间和壳体的电阻值 Measurement shall be made following application of 500V DC potential, across terminals, and across terminals and substance, for one minute.	100MΩ . min
3	介质耐压 Dielectric voltage proof	在端子和壳体之间施加 500V AC(50HZ 或 60HZ)/1min 500V AC (50HZ or 60HZ) shall be applied across terminals and substance, for one minute.	漏电流：3mA 以下 Leakage current: 3mA max
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项目 ITEM	试验条件 TEST CONDITIONS			要求 REQUIREMENTS	
4	触点抖动 Bounce	<p>按照正常使用时的力度轻按手柄中心（每秒 200mm），在导通和断开过程中测试开关抖动 Lightly striking the center of the stem at a rate encountered in normal use (200mm per second), and bounce shall be tested at "ON" and "OFF"</p> <div style="text-align: center;">  <p style="text-align: center;">“导通” “ON”</p> <p style="text-align: center;">“断开” “OFF”</p> </div>			ON-10msec.max OFF-10msec.max
4. 机械性能: MECHANICAL SPECIFICATION					
1	按力 Operating Force	<p>开关垂直于操作方向放置，在开关驱动件顶端中心逐渐施力，测量开关导通所需的最大力度。 Placing the switch such that the direction of switch operation is vertical and then gradually increasing the load applied to the center of the stem, the maximum load required for the switch to come to a stop shall be measured.</p>			3N ± 1N
2	最大行程 Full Travel	<p>开关垂直于操作方向放置，以一个等于 2 倍按力的静负荷施加在开关驱动件顶端中心，测量顶端移动的距离。 Placing the switch such that the direction of switch operation is vertical and then applying static load of 2times operating force to the center of the stem; the travel distance for the switch to come to a stop shall be measured.</p>			2.3±0.5mm
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项目 ITEM	试验条件 TEST CONDITIONS			要求 REQUIREMENTS
3	操作部强度 Operating Part Strength	开关垂直于操作方向放置，向驱动件施加静负荷持续 15 秒。 Placing the switch such that the direction of switch operation is vertical, and then a static load shall be applied for a period of 15s. 操作方向:80N Operating direction: 80N 伸张方向: 20N Drawing direction: 20N 操作方向的直角方向: 10N Right direction against operating direction:10N		无机械和电气损坏 There shall be no sign of damage mechanically and electrically.
4	操作部拔出强度 Stem Strength	开关垂直于操作方向放置，反方向实施 500mN 操作力，并测量手柄的行程范围。 Placing the switch such that the direction of switch operation is vertical, and then the 500mN force to withstand a pull applied opposite to the direction of stem operation shall be measured.		1.5mm.max.
5	端子强度 Terminal Strength	从任意方向给端脚施加 5N 的作用力,时间为 10 秒.(1 端子 1 方向) When 5N force is applied to the terminal tip in each direction for 10s.(Apply force once 1 terminal)		端脚无损伤(端脚变形除外) Terminal shall not occur (Except for terminal bending)
6	下落的冲击性 Drop impact strength	将产品插在厚度为 3cm 的试验板上,然后从 1 米的高度自然落下,实验次数为 10 回。 After the switch is subjected to dropping from 1 m height into Wooden testing board (3 cm thick oak) 10 times;		外观及性能无损伤(端脚变形除外) No abnormalities shall occur in apperance and function. (Except for terminal bending)
7	可焊性 Solderability	在以下设定条件下进行测量: Measurements shall be made following the test set forth below: (1) 焊接温度:255±2℃ Solder temperature : 255±2℃ (2) 浸入速度:20mm/s Dipping speed: 20mm/s (3) 浸入深度: 1mm Dipping depth: 1mm (4) 浸入角度: 垂直方向 Dipping an angle: vertical direction (5) 浸焊时间: 3 秒以下 Solder wetting time:3s or less		除边缘外涂层应均匀覆盖 90%以上 Except for the edge, the coating should cover a minimum 90%
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项目 ITEM	试验条件 TEST CONDITIONS			要求 REQUIREMENTS												
5、极限电气性能: ENVIRONMENTAL SPECIFICATION																
1	低温测试 Resistance to low temperature	样品应按照以下实验条件进行测试, 实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试: Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made: (1) 温度: $-40\pm 2^{\circ}\text{C}$ Temperature : $-40\pm 2^{\circ}\text{C}$ (2) 时间: 500h Time: 500h		① 接触电阻 $< 500\text{m}\Omega$ Contact resistance: $< 500\text{m}\Omega$ ② 绝缘电阻 $> 100\text{M}\Omega$ Insulation Resistance: $> 100\text{M}\Omega$ ③ 项目 4.1、4.2												
2	高温测试 Heat resistance	样品应按照以下实验条件进行测试, 实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试: Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made: (1) 温度: $85\pm 2^{\circ}\text{C}$ temperature: $85\pm 2^{\circ}\text{C}$ (2) 时间: 500h time: 500h		① 接触电阻 $< 500\text{m}\Omega$ Contact resistance: $< 500\text{m}\Omega$ ② 绝缘电阻 $> 100\text{M}\Omega$ Insulation Resistance: $> 100\text{M}\Omega$ ③ 项目 4.1、4.2												
3	温度周期性测试 Change of temperature	根据下面的测试要求进行 5 次循环的温度周期性测试, 实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试。测试期间样品应保持干燥。 After 5 cycles of following conditions, the sample shall be allowed to stand under normal temperature and humidity conditions for 1 h. and measurements shall be made. During the test water drops shall be removed. <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Temperature</th> <th style="text-align: center;">Time</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="text-align: center; vertical-align: middle;">1 cycle</td> <td style="text-align: center;">$-40\pm 2^{\circ}\text{C}$</td> <td style="text-align: center;">7~30min</td> </tr> <tr> <td style="text-align: center;">$-40\sim 85^{\circ}\text{C}$</td> <td style="text-align: center;">10~15min</td> </tr> <tr> <td style="text-align: center;">$85\pm 2^{\circ}\text{C}$</td> <td style="text-align: center;">7~30min</td> </tr> <tr> <td style="text-align: center;">$85\sim -40^{\circ}\text{C}$</td> <td style="text-align: center;">10~15min</td> </tr> </tbody> </table>			Temperature	Time	1 cycle	$-40\pm 2^{\circ}\text{C}$	7~30min	$-40\sim 85^{\circ}\text{C}$	10~15min	$85\pm 2^{\circ}\text{C}$	7~30min	$85\sim -40^{\circ}\text{C}$	10~15min	① 接触电阻 $< 500\text{m}\Omega$ Contact resistance: $< 500\text{m}\Omega$ ② 绝缘电阻 $> 100\text{M}\Omega$ Insulation Resistance: $> 100\text{M}\Omega$ ③ 项目 4.1、4.2
	Temperature	Time														
1 cycle	$-40\pm 2^{\circ}\text{C}$	7~30min														
	$-40\sim 85^{\circ}\text{C}$	10~15min														
	$85\pm 2^{\circ}\text{C}$	7~30min														
	$85\sim -40^{\circ}\text{C}$	10~15min														
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项目 ITEM	试验条件 TEST CONDITIONS			要求 REQUIREMENTS	
4	湿温测试 Moisture resistance	<p>样品应按照以下实验条件进行测试, 实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试: Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made:</p> <p>(1) 温度: 60±2℃ temperature: 60±2℃</p> <p>(2) 相对湿度: 90%~95% relative humidity: 90% to 95%</p> <p>(3) 时间: 500h time: 500h</p>			<p>① 接触电阻 < 500m Ω Contact resistance: < 500m Ω</p> <p>② 绝缘电阻 > 100M Ω Insulation Resistance: > 100M Ω</p> <p>③ 项目 4.1、4.2</p>
5	硫化试验 Sulfuration resistance	<p>样品应按照以下实验条件进行测试, 实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试: Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made:</p> <p>(1) H₂S 气体浓度: 3ppm±1ppm H₂S gas concentration: 3ppm±1ppm</p> <p>(2) 时间: 96h Time: 96h</p> <p>(3) 温度: 40±2℃ (90~95%RH) temperature: 40±2℃ (90~95%RH)</p>			<p>① 接触电阻 < 500m Ω Contact resistance: < 500m Ω</p> <p>② 绝缘电阻 > 100M Ω Insulation Resistance: > 100M Ω</p> <p>③ 项目 4.1、4.2</p>
6	盐雾试验 Salt Mist	<p>在以下设定条件下进行测量: The switch shall be checked after following test:</p> <p>(1) 温度: 35℃±2℃ temperature: 35℃±2℃</p> <p>(2) 盐溶液浓度: 5±1% (质量百分比) salt solution : 5±1%(solids by mass)</p> <p>(3) 时间: 72h±1h Time: 72h±1 hour</p>			<p>金属件上没有腐蚀斑点 No remarkable corrosion shall be recognized in metal part.</p>
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6. 极限机械性能:

ENDURANCE SPECIFICATION

	项目 ITEM	试验条件 TEST CONDITIONS	要求 REQUIREMENTS
1	工作寿命 Operation life	根据下面的测试要求进行测试: Measurement shall be made following the test set forth below: A: 带负载 resistive load (1) 按动速率: 15~20 回 /min Rate of operation: 15 to 20 times/min (2) 平均无故障寿命: 37500 回 Average fault-free life: 37500 回 B: 无负载 No resistive load 按动速率: 15~20 回 /min Rate of operation: 15 to 20 times/min 平均无故障寿命: 37500 回 Average fault-free life: 37500 回	① 接触电阻 < 500m Ω Contact resistance: < 500m Ω ② 绝缘电阻 > 100M Ω Insulation Resistance: > 100M Ω ③ 项目 4.1、4.2
2	振动 Vibration	根据以下给定条件进行测试: Measurement shall be made following the test set forth below: (1) 振动频率范围: 10~55~10Hz Vibration frequency range: 10 to 55 to 10Hz (2) 振幅 (峰-峰): 1.5mm Amplitude: 1.5mm (3) 振动方向: 包括手柄行程方向在内的三个相互垂直的方向 Direction of vibration: Three mutually perpendicular direction including the direction of stem travel (4) 测试时间: 每次 2hours . Duration: Each 2hours.	① 接触电阻 < 500m Ω Contact resistance: < 500m Ω ② 绝缘电阻 > 10M Ω Insulation Resistance: > 10M Ω ③ 项目 4.1、4.2

7. 焊接条件:

SOLDERING CONDITIONS:

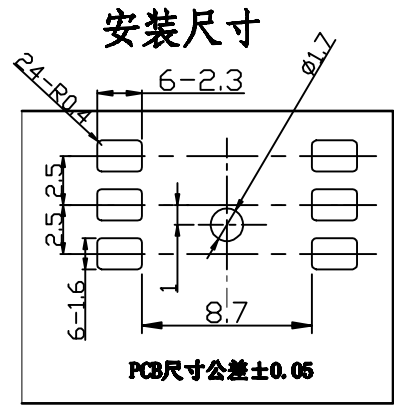
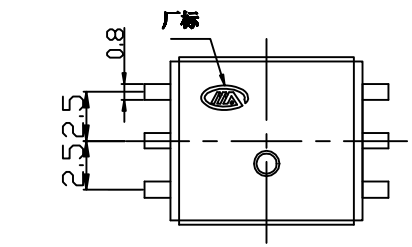
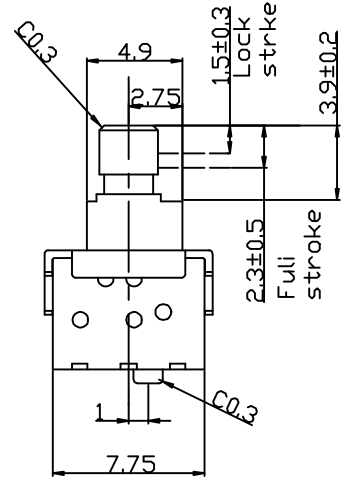
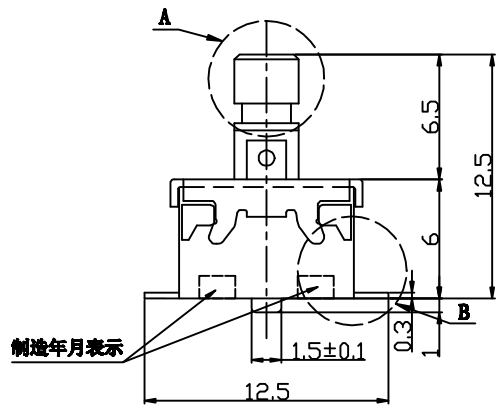
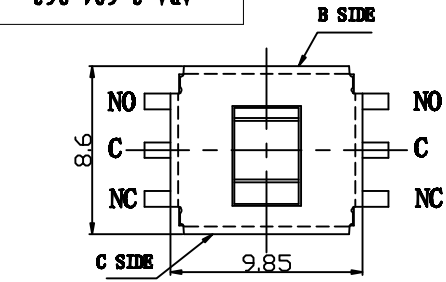
7.1	手工焊接 Hand soldering	请按以下条件进行焊接: (1) 焊锡温度: ≤300℃ (2) 连续焊接时间: ≤3 s Please practice according to below conditions: (1) Soldering temperature: 300℃ Max. (2) Continuous soldering time: 3 s Max.
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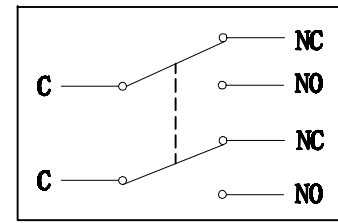
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7.2	自动浸焊 Conditions for Auto-dip	项目 Items	条件 Condition	
		助焊剂附着量 Flux built-up	不附着于零部件贴装面的程度 Mounting surface should not be coated with flux	
		预热温度 Preheating temperature	印刷电路板焊接面的周围温度 100℃~110℃. Ambient temperature of the soldered surface of PC board. 100℃~110℃..	
		预热温度时间 Preheating time	30s max.	
		焊接温度 Soldering temperature	260℃ max.	
		焊接浸渍时间 Continuous dipping time	5s max.	
		焊接次数 Number of soldering	2 次以下 2times max.	
<p>焊接说明:</p> <p>1、开关浸焊后，注意不要用溶剂清洗。 After switches were soldered, please be careful not to clean switches with solvent.</p> <p>1.1 在使用烙铁的情况下，焊锡温度应在 300℃ 以下、3 秒以内。 In the case of using soldering iron, soldering conditions shall be 300℃ max and 3 sec.max.</p> <p>1.2 浸焊时，烙铁的使用功率不得超过 50W。 Soldering iron with 50W MAX.</p> <p>1.3 浸入深度：1mm Dipping depth: 1mm</p> <p>2、设计中应注意的事项(Design instructions)</p> <p>2.1 印刷基板的安装孔尺寸参见产品图。 Follow recommended P.W.B. piercing plan in outside drawing page.</p> <p>3、注意点(Note):</p> <p>3.1 注意不要施加超负荷的压力或晃动开关。 Please be cautions not to give excessive static load or shock to swiches.</p> <p>3.2 开关浸焊后，印刷基板注意不要叠放。 Please be careful not to pile up P.W.B. after switches were soldered.</p> <p>3.3 保管时尤其应注意避开高湿高温和有腐蚀性气体的环境。如需要长时间保存，请不要打开包装箱。 Preservation under high temperature and high high humidity or corrosive gas should be avoided Especially . When you need to preserve for a long period ,do not open the carton.</p>				
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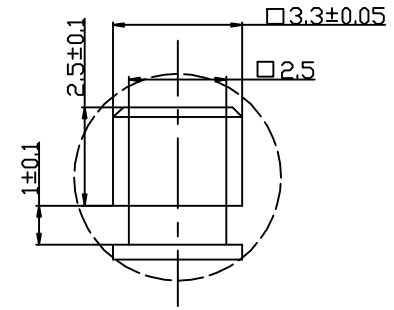
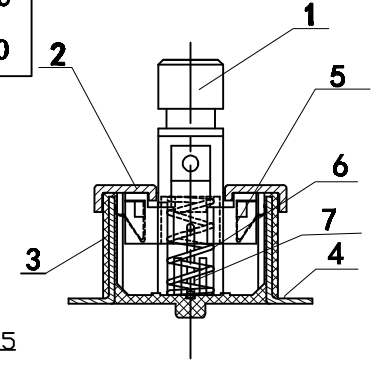
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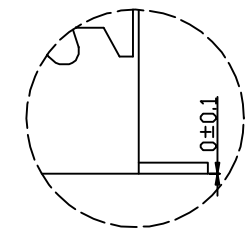
备注:
未注公差±0.3



线路图



A放大图
比例:2:1



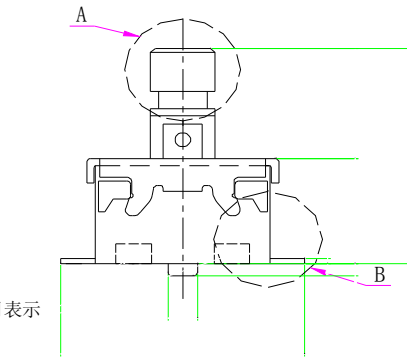
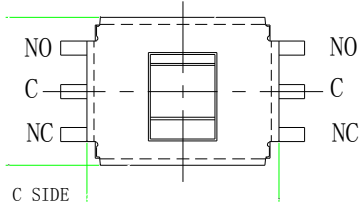
B放大图
比例:2:1

7	Sloper	ARA7.730.033	不锈钢	SUS	1	本色
6	Spring	ARA7.730.035	不锈钢	SUS	1	
5	Contact piece	ARA7.730.034	磷铜	C5210	2	镀镍
4	Terminal	ARA7.730.114	黄铜	C2680 t=0.3	1	镀镍
3	Case	ARA3.010.322	聚苯硫醚	PPS	1	黑色 94V-0
2	Cover	ARA3.010.066	冷轧钢	SPPC	1	镀锌 t=0.4
1	Lever	ARA7.870.154	增韧尼龙	PA	1	原色 94HB
序号	部件名称	图号	材料	材料规格及牌号	数量	备注

TACTRONIC

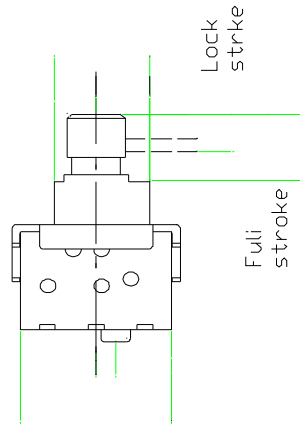
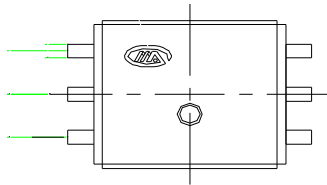
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B SIDE

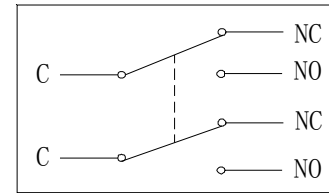
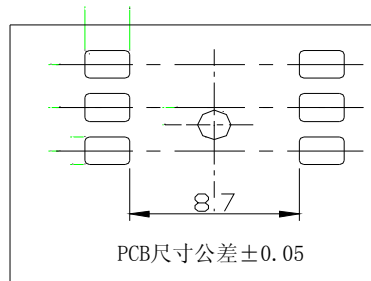


制造年月表示

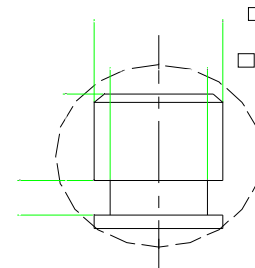
厂标



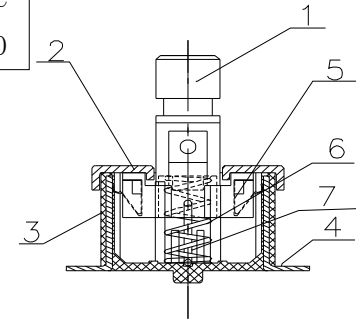
安装尺寸



线路图



A放大图
比例:2:1



B放大图
比例:2:1

7	Sloper	ARA.7, 730, 033	不锈钢	SUS	1	本色
6	Spring	ARA.7, 730, 035	不锈钢	SUS	1	
5	Contact piece	ARA.7, 730, 034	磷铜	C5210	2	镀银
4	Terminal	ARA.7, 750, 114	黄铜	C2680 t=0.3	1	镀银0.5um
3	Case	ARA.3, 810, 322	聚苯硫醚	PPS	1	黑色 94V-0
2	Cover	ARA.8, 010, 066	黄铜	H65Yt=0.4	1	镀镍
1	Lever	ARA.7, 870, 154	增韧尼龙	PA	1	94HB
序号	部件名称	图号	材料	材料规格及牌号	数量	备注