

# 承認書

## FOR APPROVAL

客戶編號  
Customer: YB01840

機種  
Product:

客戶料號  
Part No.:

客戶確認回覆: Customer Approval Status:		簽核: Signature:	
合格 PASSED		拒收 REJECTED	

### 昇威資料 SOUNDWELL INFORMATION

機種類別  
Product: V. R




品號  
Part No.: RA0920PNA0A-HA1-006

規格  
Specification: B103-PO-FA150A070-N(送貨單標籤只寫流水號)

樣辦批號  
Samples lot No.: 22172303895S

圖號  
Drawing No.:

摘要  
Note:

承辦 Prepared By	校對 Checked	審核 Approved	營業部 Sales Department
			蒙見梅

東南亞首家榮獲TUV & SQCC, ISO14001, ISO9001, IATF16949認證企業

The First Potentiometer Manufacturer in South Eastern Asia Certified By ISO14001, ISO9001, IATF16949



廣東昇威電子製品有限公司

SOUNDWELL ELECTRONIC PRODUCTS GUANGDONG CO., LTD.

昇威電子元件有限公司

SOUNDWELL ELECTRONIC COMPONENTS CO., LTD.

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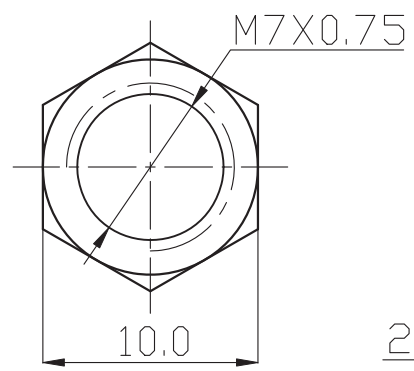
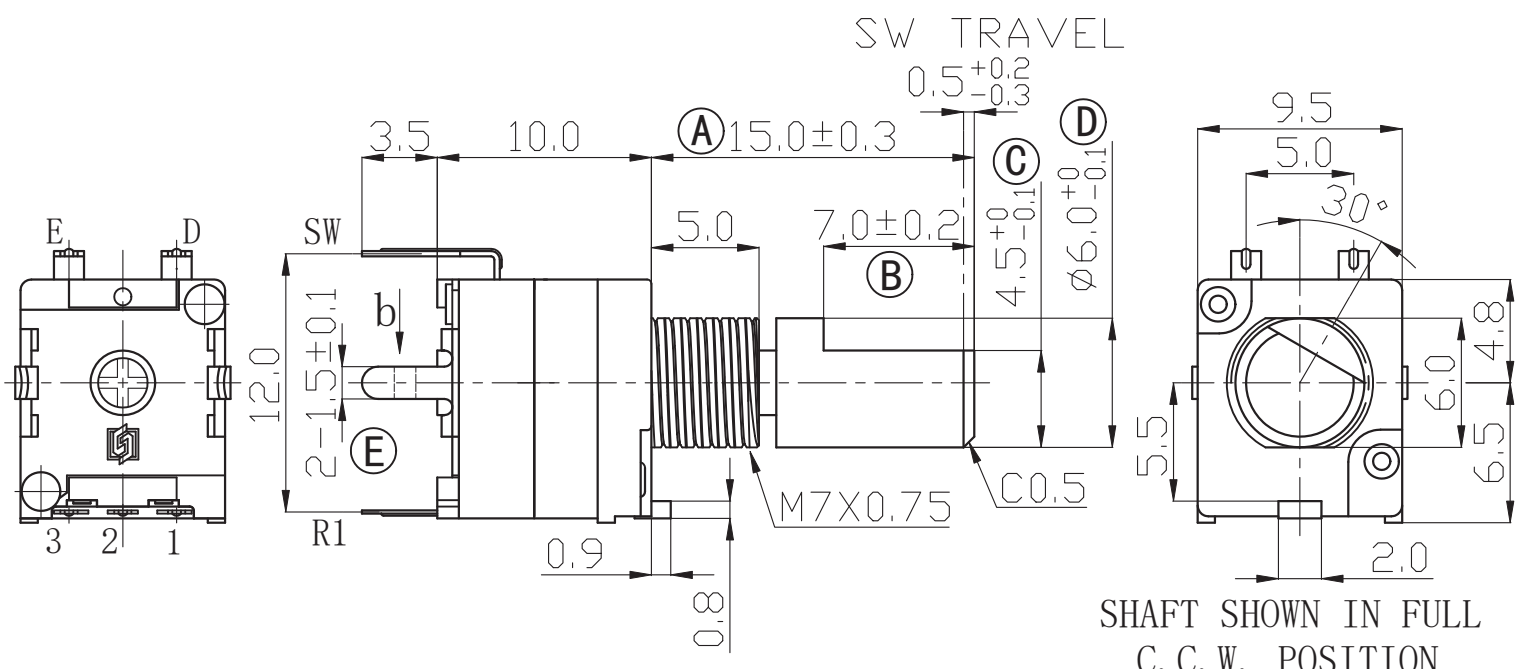
地址: 香港九龍官塘開源道六十四號源成中心十一樓五室  
Add: Room 5, 11/F, Yen Sheng Center, 64 Hoi Yuen Road, Kwun Tong, Kowloon, Hong Kong

Tel: 852-27966258

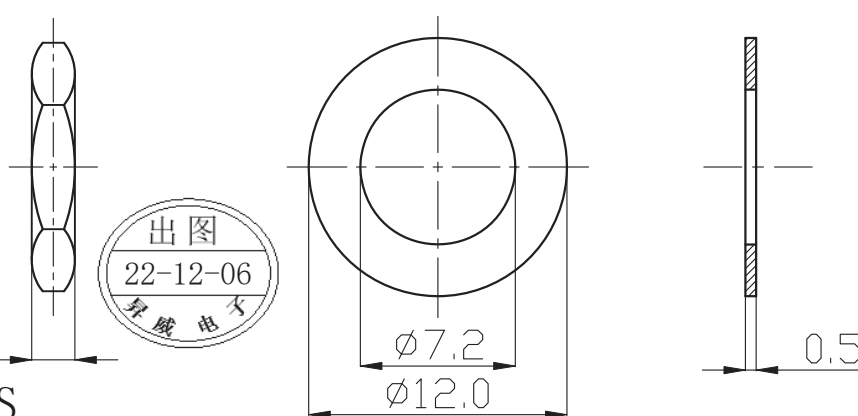
Fax: 852-27530400/27530286

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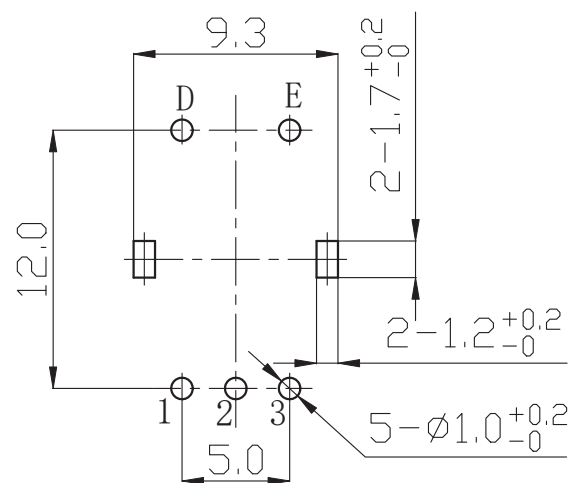




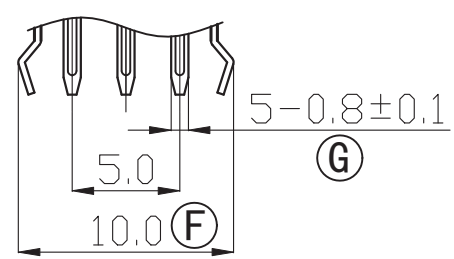
NUT 1 PCS



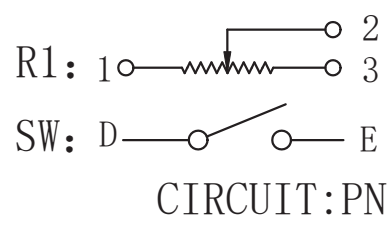
WASHER 1 PCS



P. C. B. MOUNTING DETAIL



Terminal View: b



注：重点管控尺寸 (A) ~ (G)。

01	依实物修改图纸		2019-08-06	03	
00	ORIGINAL DRAWING		2018-08-20	02	依实物修改图纸
. ISSU.	REVISION		DATE	. ISSU.	2022-12-06
<b>SOUNDWELL ELECTRONICS</b>					
譚肇鹏 HUNG KAM PIU HUNG KAM PIU			TOL. UNLESS OTHERWISE SPEC. BASIC DIMENSIONS TOL.		
			TITLE: POTENTIOMETER MODEL: RA0920PNA0A-HA1-006		
DSGD. CHKD. APPD.			SPECIFICATION: B103-P0-FA150A070		
SCALE UNIT mm			L ≤ 10 ± 0.3 10 < L ± 0.5 100 ≤ L ± 0.8 ANGLE ± 5°		

# RA0920 SERIES GENERAL SPECIFICATION

## RA0920 系列规格书

### 1、GENERAL一般事项

<p>1.1、Scope The specification applies to model RA0920 type mainly used for consumer products</p> <p>1.2、Operating temperature range:-10°C~70°C</p> <p>1.3、Storage temperature range:-25°C~70°C</p> <p>1.4、Test conditions: Standard atmospheric conditions: Unless otherwise specified,the standard range of atmospheric conditions for making measurements and test is as follows: Ambient temperature:5~35°C Relative humidity:45~85% Air pressure:86kpa to 106kpa If there is any doubt about the results,measurements shall be Made within the following limit: Ambient temperature:20±2°C Relative humidity:60~70% Air pressure:86kpa to 106kpa</p>	<p>适用范围 此规格书适用于RA0920机型</p> <p>使用温度范围 -10°C~70°C 保存温度范围 -25°C~70°C 试验状态 标准状态 无特别规定之实验及测定时以温度 5~35°C，相对湿度45~85%，气压 86~106kpa之标准状态测定。 发生判定疑问或另有特别要求则以 基准状态（温度20±2°C，相对湿度60~70%，气压 86~106kpa）为标准测定。</p>
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### 2 ELECTRICAL CHARACTERISTICS电气性能

Item 项目	Conditions 条件	Specifications 规格
2.1、Nominal total resistance and tolerance 公称全阻抗值	The resistance between terminals 1 and 3 shall be measured 端子1-3间阻值测定。	<u>10K</u> Ω ■±20%
2.2、Resistance law 阻抗变化特性	Measurement shall be made by the resistance law method. For other procedures(refer JISC5261 standard) 用电压法测试，参照JISC5261标准	<u>0B</u> Taper (Refer to the attached) <u>0B</u> 线性 (参见附页)
2.3、Power rating 额定功率 (W)	Power rating is based on continuum full load operation at the maximum voltage between terminals 1 and 3 . Power rating vs.ambient temperature shall be denoted on the following graph. 端子1-3间连续负载后的最大功率。 环境温度对功率影响的曲线如下图表示： <div style="text-align: center;"> <p style="font-size: small;">Rated power ratio 额定功率比(%)</p> <p style="font-size: small;">Ambient temperature 周围温度(°C)</p> </div>	0.05W
2.4、Rated voltage 额定电压	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Rated voltage 额定电压: <math>E = \sqrt{PR}</math></p> <p>Power rating (W) P: 额定功率</p> <p>Nominal total resistance (Ω) R: 公称全阻抗值</p> <p>When the rated voltage exceeds the maximum operating voltage. The maximum operating voltage shall be the rated voltage. 额定电压大于最高使用电压时,最高使用电压作为额定电压。</p> </div> <div style="width: 45%; border-left: 1px solid black; padding-left: 5px;"> <p>Max Operation Voltage 最高工作电压</p> </div> </div>	AC 50V

# RA0920 SERIES GENERAL SPECIFICATION

## RA0920 系列规格书

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2 ELECTRICAL CHARACTERISTICS 电气性能			
Item 项 目	Conditions 条 件		Specifications 规 格
2.5、Residual resistance 残留电阻	The resistance at the end of the (A).Resistance between terminals 1 and 2, and terminal 2 and 3 shall be measured. A: Travel of effective slide. 接触刷停留在(A)终端位置,在端子1-2间,端子2-3间测定之电阻值 A:有效滑动行程		Residual resistance(残留电阻): R1,2: $\leq 10 \Omega$ R2,3: $\leq 20 \Omega$
2.6、Slide noise 滑动噪音	Apply DC 20V between terminals 1-3 to measure the noise voltage . ( rated voltage $\leq 20V$ .apply by rated voltage ) 在端子1-3间加直流电压20V(额定电压 $\leq 20V$ ,则以额定电压值测试)后,测定的杂音电压. Slide speed : 1 Cycles/3s 滑动速度: 1来回/3秒		47mVp-p or less $\leq 47mVp-p$
2.7、Insulation resistance 绝缘阻抗	Apply voltage of DC 500V and measure for 1 minute. DC 500V 1分钟	Between individual terminals and frame 端子-固定板	50M $\Omega$ or more $\geq 50M\Omega$
2.8、Dielectric strength 耐电压	Trip current:2mA Measuring frequency : 50~60Hz ; 250V AC for 1 minute. 电流: 2mA 频率: 50~60Hz AC 250V 1分钟	Between individual terminals and frame 端子-固定板	Electrical characteristics shall be 电气性能符合规定要求。
3 Mechanical characteristics 机械性能			
Item 项 目	Conditions 条 件		Specifications 规 格
3.1、Total mechanical rotation 全回转角度	Angle of effective rotation 有效旋转角度		300 $\pm 10^\circ$
3.2、Rotational torque 旋转力矩	Rotational speed (1cycle/3s) 旋转速度 1回转 / 3 秒	standard atmospheric conditions 常温5 $^\circ C$ 至35 $^\circ C$	10.5 $\pm 9.5$ mNm (105 $\pm 95$ gf.cm)
		-10 $^\circ C$	800gf.cm or less
		70 $^\circ C$	10~180gf.cm or less
3.3、stop strength 止档强度	The following torsion moment load of 3Kgf.cm shall be applied to the shaft for 5s at both ends (after fixation) 固定后于旋转前后两端末加3Kgf.cm力矩保持5秒		Electrical characteristics shall be satisfied. with specification. 电气性能符合规定要求
3.4、Nut tightening strength 螺母紧固强度	Nut tighten with 8.0kgf.cm 螺母紧固强度为8kgf.cm.		No excessive uneven rotation feeling occur 不可有回转发生(打滑)
3.5、Shaft push & pull strength 轴向推拉强度	Push and pull static load of 8KG shall be applied to the shaft in the axial direction for 10s.(After soldering of the PC board) 在轴端,沿轴向施加 8KG的静负荷力推和拉各10秒钟(焊锡固定在PCB上)。		Shaft without damage, rotational torque without abnormality .Electrical characteristics shall be satisfied with spec 轴无破损,旋转无异常。 电气性能符合规定要求。
3-6、Shaft wobble 轴摆动	A momentary load of 50mN.m(0.51Kgf.cm) shall be applied at the point 5mm from the tip of the shaft in a direction perpendicular to the axis of shaft. 在轴前端5mm处,沿径向瞬间施加50mN.m (0.51Kgf.cm)的力.		1.0x L / 30mm p-p MAX(L:shaft length) 1.0 x L / 30mm p-p 以下(L:安装长度)

# RA0920 SERIES GENERAL SPECIFICATION

## RA0920 系列规格书

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<b>3 Mechanical characteristics 机械性能</b>		
Item 项 目	Conditions 条 件	Specifications 规 格
3-7、Side thrust strength of shaft 轴的垂直押引强度	A load of 20N(2.04Kgf) shall be applied at the point 5mm from the tip of the shaft in a direction perpendicular to the axis of shaft for 10s. 在轴前端5mm处加20N(2.04Kgf)的静负荷力10秒钟.	Without excessive play of bending in shaft. No mechanical abnormally. 轴不得有明显松动及接触不良.
3-8、Shaft play in rotational wobble 轴的回转方向摆动	Testing by angle board. 用角度板测定.	4° MAX 4° 以下
3-9、Shaft play in axial direction 轴向间隙	The pull / push load of 0.5N(51gf) shall be imposed on the shaft. 在轴上施加0.5N(51gf)的推力或拉力.	0.4mm MAX. 0.4mm以下.
<b>4 ENDURANCE CHARACTERISTICS 耐久性能</b>		
Item 项 目	Conditions 条 件	Specifications 规 格
4.1、Solder ability 焊锡性	The terminals shall be immersed into solder bath at 260±5°C for 3±1s in the same manner as para. 端子在260±5°C温度的焊锡槽内浸锡3±1秒。	shall cover 75% minimum of the surface being immersed. 浸渍面须有75%以上焊锡附着
4.2、Resistance to soldering heat 焊锡耐热性	Manual soldering 手工焊接 Bit temperature of soldering iron: 350°C less than Application time of soldering iron: within 3s 温度350°C以下, 时间3秒以内。 Dip soldering 槽焊 Printed wiring board : copper clad laminate board with thickness of 1.6mm. 使用基板: t=1.6mm的覆铜板。 Preheating : 1、Surface temperature of board: 100°C or less. 2、Preheating time : within 2 min. 预热: 基板表面温度100°C以下, 时间2分钟以内。 Soldering : Solder temperature : 260±5°C or less Immersion time : within 3s 焊接: 温度260±5°C或以下, 时间3秒以内。	Change in total resistance is relative to the value before test : ±5%, Without case deformation of case or terminals loosening . Electrical characteristics shall be satisfied. With specification 总阻变化值: ±5% 外观无变形, 端子无松动, 电气性能符合规定要求。
4.3、Resistance to heat 耐热性	240±10h in a thermostatic chamber. Then the potentiometer shall be measured after maintaining at standard atmospheric conditions for 1h . 温度70±2°C恒温槽中240±10小时放置后, 置于常温常湿1小时除去水滴后测定。	Change in total resistance is relative to the value before test : ±20% 总阻变化值: 初期值的±20%
4.4、Resistance to cold 耐寒性	The potentiometer shall be stored at a temperature of -25±3°C for 96±4h in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed. And measure the potentiometer which shall be subjected to standard atmospheric conditions for 1h . 温度-25±3°C恒温槽中96±4小时放置后, 置于常温常湿1小时除去水滴后, 1小时内测定。	Change in total resistance is relative to the value before test : ±20% 总阻变化值: 初期值的±20%

# RA0920 SERIES GENERAL SPECIFICATION

## RA0920 系列 规格书

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<b>4 ENDURANCE CHARACTERISTICS耐久性能</b>																	
Item 项 目	Conditions 条 件	Specifications 规 格															
4.5、 Damp heat 耐湿性	<p>The potentiometer shall be stored at a temperature of <math>40\pm 2^{\circ}\text{C}</math>, with relative humidity of 90% to 95% for <math>96\pm 4\text{h}</math> in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed and measure the potentiometer which shall subjected to standard atmospheric conditions for 1h.</p> <p>温度<math>40\pm 2^{\circ}\text{C}</math>,湿度90-95%,恒温恒湿槽中放置<math>96\pm 4</math>小时后,置于常温常湿1小时除去水滴后,1小时内测定。</p>	<p>Change in total resistance is relative to the value before test : <math>+35\%\sim -5\%</math> 总阻变化值:初期值的<math>+35\%\sim -5\%</math></p> <p>Insulation resistance: <math>50\text{M}\Omega</math> or more 绝缘阻抗: <math>\geq 50\text{M}\Omega</math></p> <p>Noise : <math>150\text{mV p-p}</math> or less 转动噪音: <math>\leq 150\text{mV p-p}</math></p>															
4.6、 Change of temperature 温度循环试验	<p>The potentiometer shall be subjected to 5 successive change of temperature cycles as shown in table below. Then is surface moisture shall be removed. And measure the potentiometer which shall be subjected to standard atmospheric conditions for 1hour .</p> <p>以下条件温度连续5个周期的试验后,置于常温常湿1小时除去水滴后,1小时内测定。</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 45%; text-align: center;">Temperature 温度</th> <th style="width: 50%; text-align: center;">Duration 放置时间</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;"><math>-10\pm 3^{\circ}\text{C}</math></td> <td style="text-align: center;">30 min (分)</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">standard atmospheric conditions 常温</td> <td style="text-align: center;">10 to 15</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;"><math>70\pm 2^{\circ}\text{C}</math></td> <td style="text-align: center;">30 min (分)</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">standard atmospheric conditions 常温</td> <td style="text-align: center;">10 to 15 min(分)</td> </tr> </tbody> </table>		Temperature 温度	Duration 放置时间	1	$-10\pm 3^{\circ}\text{C}$	30 min (分)	2	standard atmospheric conditions 常温	10 to 15	3	$70\pm 2^{\circ}\text{C}$	30 min (分)	4	standard atmospheric conditions 常温	10 to 15 min(分)	<p>Change in total resistance is relative to the value before test : <math>\pm 30\%</math> 总阻变化值: 初期值的<math>\pm 30\%</math></p> <p>Insulation resistance: <math>100\text{M}\Omega</math> or more 绝缘阻抗 : <math>\geq 100\text{M}\Omega</math> .</p> <p>Dielectric strength : Without damage to parts arcing or breakdown etc. 耐电压:无损伤,变形,绝缘破坏等情形.</p> <p>Appearance: There shall be no deformation or cracks of molded part. 外观: 塑胶部分无形成破裂</p>
	Temperature 温度	Duration 放置时间															
1	$-10\pm 3^{\circ}\text{C}$	30 min (分)															
2	standard atmospheric conditions 常温	10 to 15															
3	$70\pm 2^{\circ}\text{C}$	30 min (分)															
4	standard atmospheric conditions 常温	10 to 15 min(分)															
4.7、 Endurance 耐久性	<p>The moving contact without electrical load shall be rotated from one end stop to the other and returned to its original position exceeds 90% of effective angle. This procedure constitutes 1 cycle. And the moving contact shall be subjected to 600 cycles per hour. total <math>15000\pm 200</math> cycles. (<math>5000</math> to <math>8000</math> continuous cycles for 24h).</p> <p>轴以600周/小时(来回算1周)的速度旋转,24小时旋转5000~8000周,有效旋转角度超过90%,共<math>15000\pm 200</math>周。</p>	<p>Change in total resistance is relative to the value before test : <math>\pm 15\%</math> 总阻变化值: 初期值的<math>\pm 15\%</math></p> <p>Rotational noise: <math>150\text{mV p-p}</math> or less 转动噪音: <math>\leq 150\text{mV p-p}</math></p> <p>Rotational torque: No less than 50% of the initial torque . 旋转力矩: 不低于初期规格值的50%。</p> <p>Residual resistance 残留电阻 : R1, 2: <math>\leq 20 \Omega</math> R2, 3: <math>\leq 40 \Omega</math></p>															

### 5 Application Notes 使用上的事项

Avoid storing the products in a place at high humidity and in Corrosive gases. please use this product with 12 months limitation. If any remainder left after packing is opened, please store it with proper moistureproofing, gasproofing etc.

避免储藏于高温、高湿及腐蚀的场所。产品购入后需在12个月内使用完。拆包装后未使用完的剩余产品需储藏于防潮防毒的环境下。



# RA0920 SERIES SPECIFICATION

## RA0920系列规格书

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### Push switch portion 推动开关部分

Note: The following specification is only suitable for the one type with switch construction of RA0920 series.

注：以下规格只适用于此RA0920系列带开关结构。

1-1、Rated capacity (Resistance load): DC 5V 10mA (1mA MIN)

额定容量（电阻负荷）：DC 5V 10mA (1mA 以上)

### 1-2 Electrical characteristics 电气性能


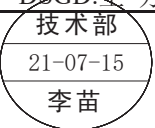
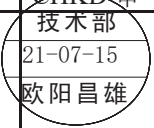

ITEM 项目	CONDITIONS 条件	SPECIFICATIONS 规格
1-2-1、Contact resistance 接触电阻	Voltage step-down test at DC 5V 1mA 用DC 5V 1mA 电压降下法测定.	100mΩ MAX 100mΩ 以下
1-2-2、Bouncing 振荡	Shaft shall be rotated at 1 cycles/S (OFF-ON-OFF) 以1秒钟1往返（OFF-ON-OFF）回转运转	10mS MAX 10mS 以下
1-2-3、Insulation resistance 绝缘电阻	Measurement shall be made under the condition which a voltage 50V DC 1min±5S is applied between individual terminals and tracked 在端子与安装板间施加电压DC 50V 1分钟±5秒。	Between individual terminals and bracket 10MΩ MIN. 在端子安装板间10MΩ以上
1-2-4 Dielectric strength 耐电压	A voltage of 50V AC /min or 60 V AC /2S( leak current 1mA) be applied between individual terminals and bracket.在端子与安装板间施加AC 50V 1分钟或AC 60V 2秒钟（漏电流1mA）	Without arcing or breakdown. 不得有绝缘损坏。

### 1-3 Mechanical characteristics 机械性能

1-3-1、Switch circuit and number of pulse 开关电路、接点数		Single pole and single throw (push on) 单极单投（推ON）
1-3-2、Travel of switch 开关移动量		0.5 +0.2 -0.3 mm
1-3-3、Operating force of switch 开关作动力		9±3 N(900 ± 300 gf)

### 1-4 Endurance characteristics 耐久性能

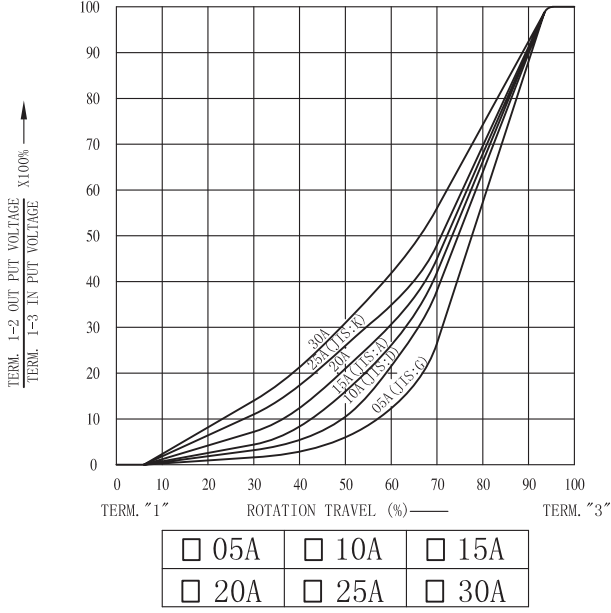
Push operating life 寿命特性	The encoder's shall be pushed to 20,000 cycles at a speed of 1800±200/H without electrical load.(shaft push load: 1kgf.cm max.) 在无负荷条件下,对轴以每小时1800±200次的速度推动20,000次,(轴按压力1kgf. cm以下).	Contact resistance : 200mΩ max. Specification in clause 1-2-2~4,1-3-1~2 shall be satisfied. Operating force:Before test 80%. 接触电阻 : 200mΩ以下. 1-2-2~4,1-3-1~2 满足初期规格. 开关动作为寿命前的80%.
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文控编号: RA-046	编制日期	 <b>SOUNDWELL ELECTRONIC</b>			TITLE标题: Slide Series Potentiometer 旋转系列电位器
版本号: 03	2009-10-28				
REVISION变更记事:	更改时间	DSGD.主办	CHKD.审查	APPD.核准	DOCUMENT NO.文号: RA0920
修改开关按压寿命规格	2009-10-28				
修改按压力矩	2011-11-8				

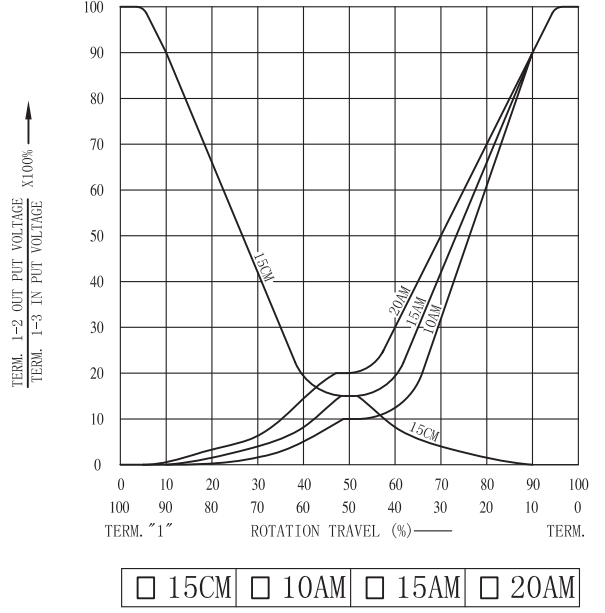
# STANDARD RESISTANCE TAPER (電位器専用)

Rotary, Slide, Equalizer & Trimmer (Only be applicable to potentiometer)

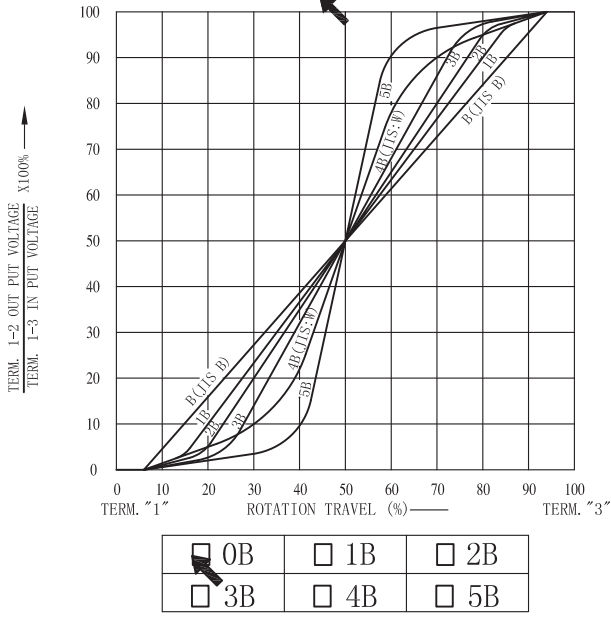
TAPERS (A) SERIES



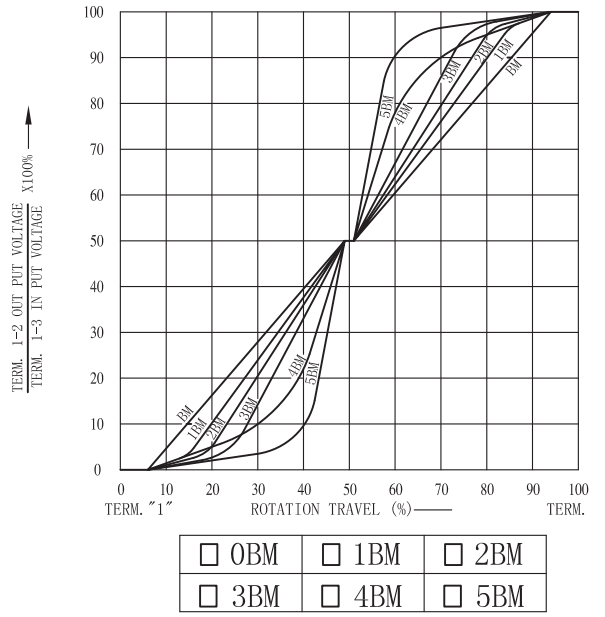
TAPERS (A&C) WITH 50% TAP



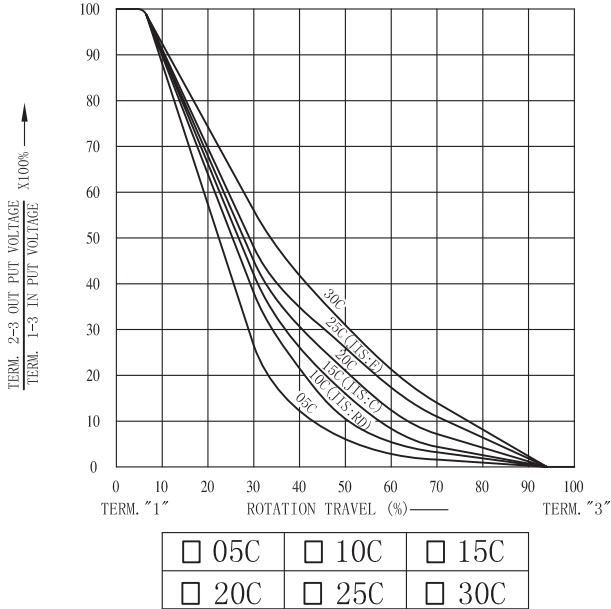
TAPERS (B) SERIES



TAPERS (B) WITH 50% TAP



TAPERS (C) SERIES



TAPERS (M & N)

