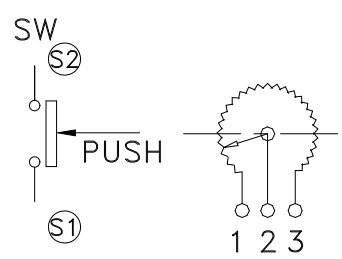
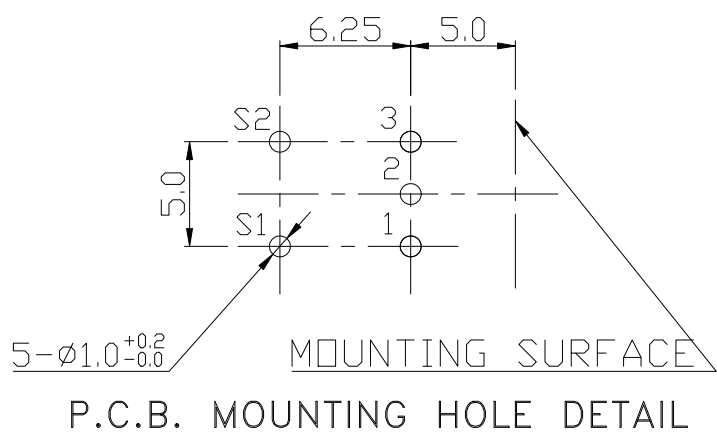


SHAFT SHOWN IN FULL C.C.W. POSITION



CIRCUIT: PN

注：重点管控尺寸 A - E。

01			03	
00	ORIGINAL DRAWING	2023-03-25	02	
. ISSU.	REVISION	DATE	. ISSU.	
曾煜	HUNG KAM PIU	HUNG KAM PIU	TOL. UNLESS OTHERWISE SPEC.	
DSGD.	CHKD.	APPD.	BASIC DIMENSIONS	TOL.
	SCALE		L ≤ 10	± 0.3
	UNIT	mm	10 < L	± 0.5
			100 ≤ L	± 0.8
			ANGLE	± 5°
			SOUNDWELL ELECTRONICS	
			TITLE: POTENTIOMETER	
			MODEL: RA0902PNA0X-VA1-009	
			SPECIFICATION: B203-P4-FA230A120	

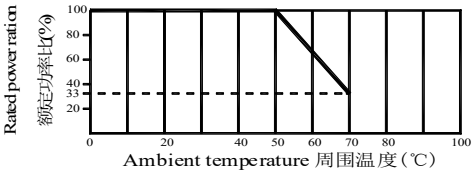
# RA0902PN/PG SERIES GENERAL SPECIFICATION

## RA0902PN/PG 系列规格书

### 1、GENERAL 一般事项

<p>1.1、Scope The specification applies to model RA0902PN/PG type mainly used for consumer products Rotational (1 shaft,1/2 dual)</p> <p>1.2、Operating temperature range</p> <p>1.3、Storage temperature range</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 style="text-align: center;">适用范围</p> <p>此规格书适用于RA0902PN/PG机型 回转型（1轴，1/2联） 使用温度范围 -10°C~60°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>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### 2、ELECTRICAL CHARACTERISTICS 电气特性

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>20K</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	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所示： 	B Taper    0.05W Other Taper    0.025W
2.4、Rated voltage 额定电压	Rated voltage 额定电压: $E = \sqrt{PR}$ Power rating P: 额定功率    (W) Nominal total resistance R: 公称全阻抗值    (Ω) 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。	Maximum operating voltage 最高使用电压  22V AC
2.5、Residual resistance 残留电阻	The resistance at each end of the (A). Resistance between terminals 1 and 2, terminal 2and 3 shall be measured.A: Angle of effective rotation 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:有效回转角度	Residual resistance: R1,2: ≤ <u>10</u> Ω R2,3: ≤ <u>20</u> Ω 残留电阻: R1,2: ≤ <u>10</u> Ω R2,3: ≤ <u>20</u> Ω
2.6、Rotational noise 转动噪音	Apply DC 20V between terminals 1-3 to measure noise voltage . ( rated voltage ≤20V . Apply by rated voltage).  在端子1-3间加直流电压20V(额定电压≤20V,则以额定电压值测试)后,测定的杂音电压。  Shaft rotation : 1 rotation /3Sec 轴转速:1回转/3秒	100mVp-p or less ≤100mVp-p

# RA0902PN/PG SERIES GENERAL SPECIFICATION

## RA0902PN/PG 系列规格书

2.7、 Tracking error 连动误差	<p>The voltage of 2 V r.m.s. Shall be applied between terminals 1 and 3 and between terminals 1' to 3' by measuring frequency at 1KHz. The output voltage shall be measured between terminals 1 and 2 and between terminal 1' and 2'(for the 15C and 25C taper. the measurement shall be made between terminals 2 and 3 and between terminals 2'and 3') it should be the same standard with the first measuring result . If there is not any doubt about the results This DC. voltage shall be 在端子1-3间,1'-3'间,输入频率1KHz 电压2V的正弦波实值,测量端子1-2间,端子1'-2'间的输出电压(适用于15C和25C线型,端子2-3间,2'-3'间也应测量输出电压) 结合第一次的测量结果,应为同一标准. 如对测量结果没有质疑, 则将此电压作为测试电压值。</p> <p>Input impedance of the voltmeter: 10MΩ or more 电压表输入阻抗:10M Ω 以上</p> <div style="text-align: center;"> </div> <p style="text-align: right; color: blue;">此项不适用</p>	$\frac{4}{\leq} \text{ dB or less}$	
2.8、 Insulation resistance绝缘阻抗	Apply DC 250 V for 1 minute. DC 250V 1分钟	Between individual terminals and frame. 端子-固定板	100MΩ or more ≥100MΩ
2.9、 Dielectric strength耐电压	Trip current:2mA Measuring frequency : 50~60Hz ; 300V AC for 1 minute. 电流: 2mA 频率: 50~60Hz AC 300V 1分钟	Between individual terminals and frame 端子-固定板	Electrical characteristics shall be satisfied with specification . 电气性能符合规定要求
<b>3 MECHANICAL CHARACTERISTICS 机械特性</b>			
<b>Item 项目</b>	<b>Conditions 条件</b>		<b>Specifications 规格</b>
3.1、 Total mechanical rotation全回转角度	Angle of effective rotation 有效旋转角度		300±10°
3.2、 Rotational torque 旋转力矩 此项不适用	Rotational speed 旋转速度 S 1回转 / 3秒	standard atmospheric conditions 常温5°C至35°C	6.5 ±5.5 mNm(65±55 gf.cm)
		-10°C	450gf.cm or less
		60°C	10~100gf.cm
4.3、 Number of Detents 定位数目			<input type="checkbox"/> without Detent <input type="checkbox"/> 1C (Center Detent中段功能) <input checked="" type="checkbox"/> Other其它 11 C
3.3、 Click slip out force定位推动力	Rotation speed 60°/ S , standard atmospheric5°C to 35°C(center click) 旋转速度 60°/S 常温5°C至35°C		18 ± 5 mNm (180±50 gf.cm)
3.4、 Shaft stop strength 止档强度	The following torsion moment load of 3kgf.cm shall be applied to the shaft for 3sec at both ends (after fixation) 固定后于旋转前后两端末加3Kgf.cm力矩并持续3秒.		Electrical characteristics shall be satisfied. 电气性能符合规定要求
3.5、 Shaft push & pull strength 轴向推拉强度	Push &pull static load of 3Kgf shall be applied to the shaft in perpendicular to axial directions for 10 s(After fixation) 固定后在与轴垂直的端面方向加3Kgf.cm静载荷并保持10秒。		Shaft without damage .rotational torque without abnormality . Electrical characteristics shall be satisfied with speciification . 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 500gf.cm shall be applied at the point 5 mm from the tip of the shaft in a direction perpendicular to the axis (after fixation). 固定后在与轴心末端往下5mm处施加500gf.cm静载荷。		$0.7 * L / 20 \text{ mm p-p or less}$ $\leq 0.7 * L / 20 \text{ mm p-p}$ <p>L is the length between mounting surface and measuring points L: 固定面到测试点的距离</p> Electrical characteristics shall be satisfied with specification 电气性能符合规定要求
3.7、 Nut tightening strength 螺母紧固强度	Nut tighten with 8.0kgf.cm 螺母紧固强度为8.0kgf.cm.		No excessive uneven rotation feeling 不可有回转发生 (打滑)。
3.8、 Shaft Push Stroke 轴心按压行程			0.5±0.3mm
3.9、 Switch contact resistance . 开关接触电阻			100m Ω Less than
3.10、 Switch power rating开关承受负载			≤12V DC 0.5A
3.11、 Switch working torque开关工作力矩			3 ± 1 N(300±100gf)

4 ENDURANCE CHARACTERISTICS耐久性能		
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 $260^{\circ}\pm 5^{\circ}\text{C}$ for $3\pm 0.5\text{s}$ .端子在 $260^{\circ}\pm 5^{\circ}\text{C}$ 温度的焊锡槽内浸锡 $3\pm 0.5$ 秒	A new uniform coating of solder shall cover a minimum of 75% 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	Substrate to be soldered: Cooper clad laminated phenol of 1.6mm thickness, Do not use double sided through PCB. Preheating: Surface temperature of substrate shall be settled qithin $100^{\circ}\text{C}$ in one minutes. 使用基板: T=1.6mm厚铜泊积层板面. 预热: 基板表面温度 $100^{\circ}\text{C}$ 以下, 1分钟以内. Wave soldering: 波峰焊条件: Bit temperature温度: $260^{\circ}\pm 5^{\circ}\text{C}$ Application time of soldering 时间: $5\pm 1\text{ sec}$	Change in total resistance is relative to the value before test: $\pm 5\%$ , Without case deformation of case or terminals loosening. Electrical characteristics shall be satisfied. With specification 总阻变化值: $\pm 5\%$ 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	The potentiometer shall be stored at a temperature of $70^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for $120\pm 8\text{h}$ in a thermostatic chamber. Then the potentiometer shall be measured after maintaining at standard atmospheric conditions for 1h in order to remove surface moisture. 温度 $70^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 恒温槽中 $120\pm 8$ 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: $\pm 20\%$ 总阻变化值: 初期值的 $\pm 20\%$
4.4、 Resistance to Cold 耐寒性	The potentiometer shall be stored at a temperature of $-25\pm 3^{\circ}\text{C}$ for $120\pm 4\text{h}$ 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 $-25\pm 3^{\circ}\text{C}$ 恒温槽中 $120\pm 4$ 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: $\pm 20\%$ 总阻变化值: 初期值的 $\pm 20\%$
4.5、 Damp heat 耐湿性	The potentiometer shall be stored at a temperature of $40\pm 2^{\circ}\text{C}$ , with relative humidity of 90% to 95% for $120\pm 4\text{h}$ 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.. shall be made. 温度 $40\pm 2^{\circ}\text{C}$ , 湿度90-95%, 恒温恒湿槽中放置 $120\pm 4$ 小时后, 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: $+35\%\sim -5\%$ 总阻变化值: 初期值的 $+35\%\sim -5\%$ Insulation resistance: $20\text{M}\Omega$ or more 绝缘阻抗: $\geq 20\text{M}\Omega$ Noise: $150\text{mV p-p}$ or less 转动噪音: $\leq 150\text{mV p-p}$
4.6、 Change of temperature 温度循环试验	The potentiometer shall be subjected to 5 successive change of temperature cycles, each as shown in table below. surface moisture shall be removed. And measure the potentiometer which shall be subjected to standard atmospheric conditions for 1hour.	Change in total resistance is relative to the value before test: $\pm 30\%$ 总阻变化值: 初期值的 $\pm 30\%$ Insulation resistance: $100\text{M}\Omega$ or more 绝缘阻抗: $\geq 100\text{M}\Omega$ 。

# RA0902PN/PG SERIES GENERAL SPECIFICATION

## RA0902PN /PG 系 列 规 格 书




4/4

	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。		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。  Appearance: There shall be no deformation or cracks of molded part.  外观: 塑胶部分无形成破裂	
		Temperature 温度		Duration 放置时间
	1	-10±3°C		30 min (分)
	2	standard atmospheric conditions 常温		10 to 15 min(分)
	3	70±2°C		30 min (分)
4	standard atmospheric conditions 常温	10 to 15 min(分)		
4. 7、 Endurance 耐久性	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.  Resistance Rotational Life 10000 Time min.(5000 to 8000continuous cycles for 24h).Switch Push Life 10000 Time min.  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%,电阻旋转寿命10000次最低限,开关按压寿命10000次最低限。		Change in total resistance is relative to the value before test : ±15% 总阻变化值: 初期值的±15%  Rotational noise:150mVp-p or less 转动噪音: ≤150mVp-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%。  Residual resistance : 残留电阻 R1,2: ≤ <u>20</u> Ω R2,3: ≤ <u>40</u> Ω  Contact resistance : 200mΩ max. 接触电阻 : 200mΩ以下。  Operating force:Before test 80%. 开关动作力为寿命前的80%。	

### 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.

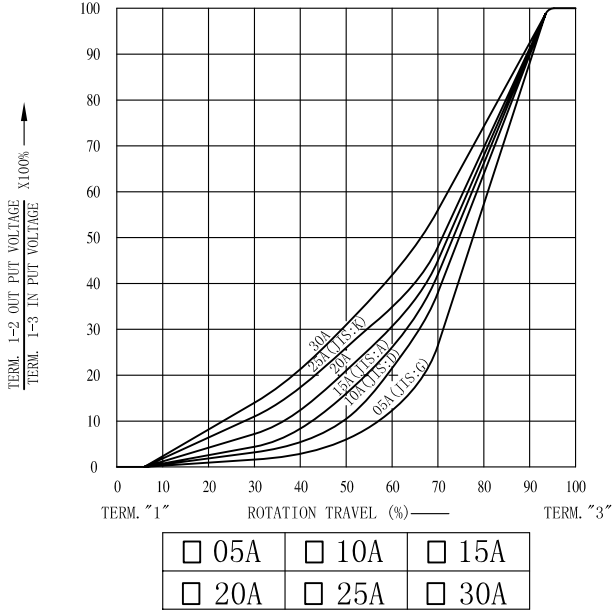
避免储藏于高温、高湿及腐蚀的场所。产品购入后需在12个月内使用完。拆包装后未使用完的剩余产品需储藏于防潮防毒的环境下。

文控编号: RA-028	编制日期						
版本号: 04	2006.06.09						
REVISION变更记事:	更改时间	DSGD.主办	CHKD.审查	APPD.核准	TITLE标题:		
1、变更开关工作力矩及使用温度	2006. 11. 14	 技术部 23-03-25 李苗	 技术部 23-03-25 欧阳昌雄	 技术部 23-03-25 苏朝晖	POTENTIOMETER电位器		
2、增加螺母紧固强度	2006. 12. 05				DOCUMENT NO.文号:		
3、更改旋转力矩参数	2007. 09. 01				RA0902PN/PG		
4、增加定位力距规格	2008. 07. 16						

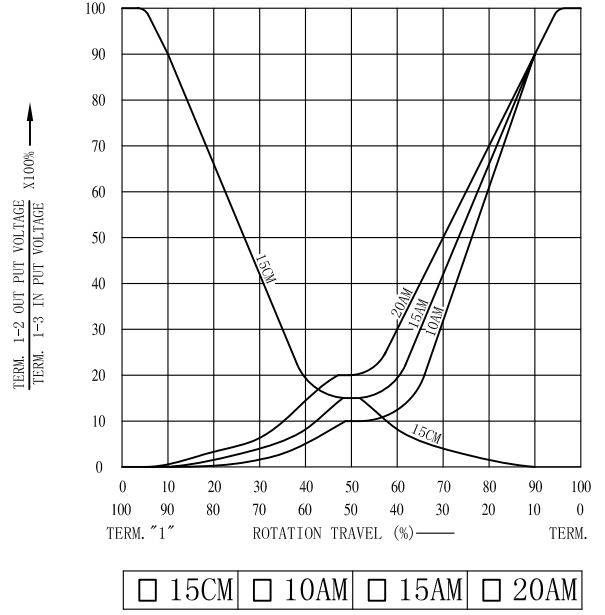
# STANDARD RESISTANCE TAPER (電位器専用)

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

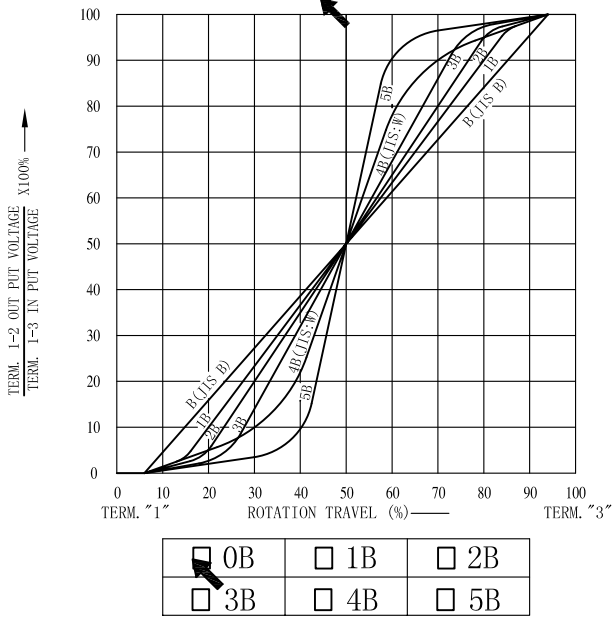
TAPERS (A) SERIES



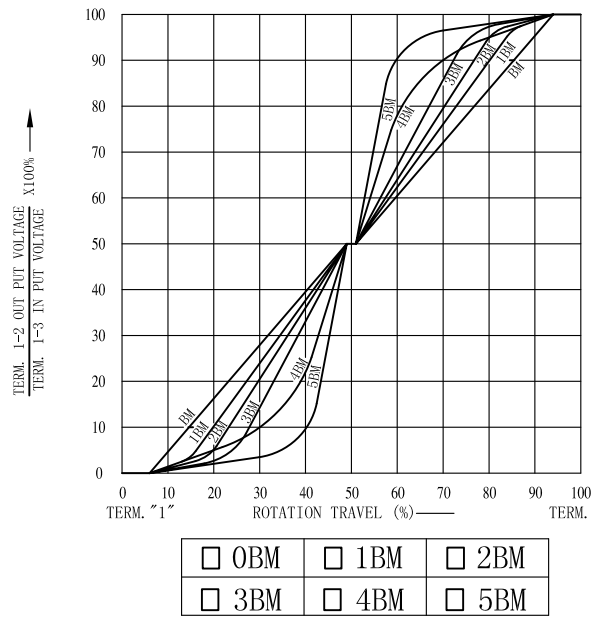
TAPERS (A&C) WITH 50% TAP



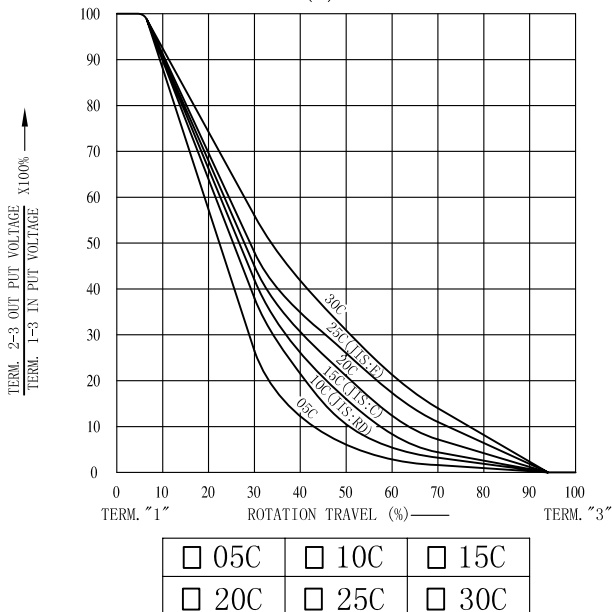
TAPERS (B) SERIES



TAPERS (B) WITH 50% TAP



TAPERS (C) SERIES



TAPERS (M & N)

