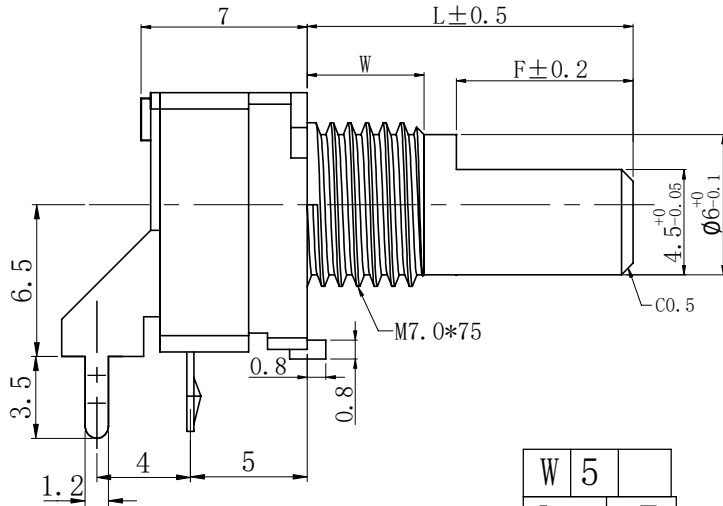
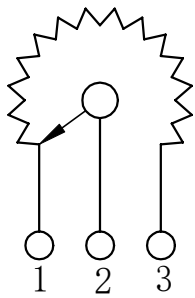
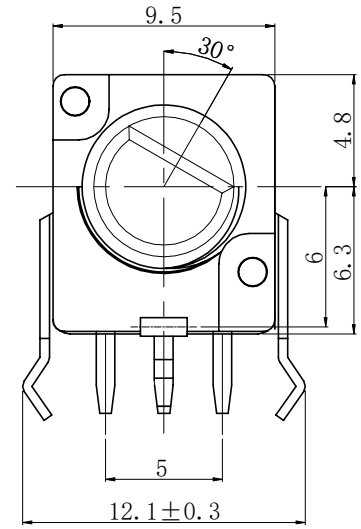


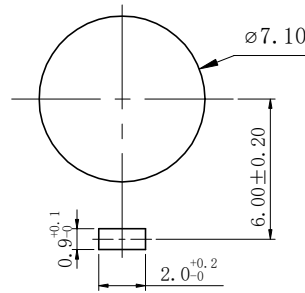
FULL C.C.W POSITION



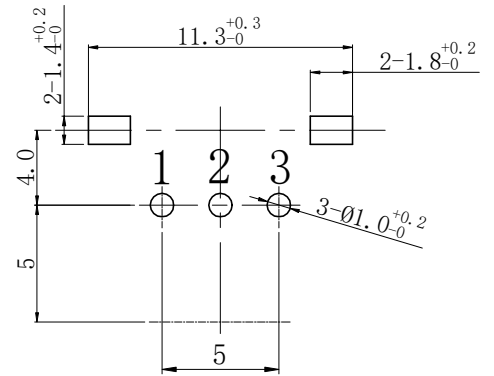
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CIRCUIT:NO

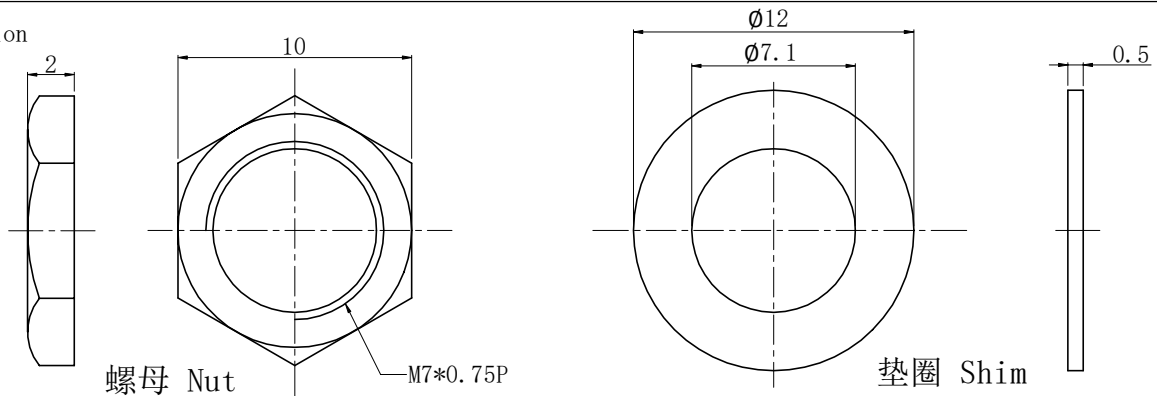


Panel layout



P.C.B MOUNTING DETAIL

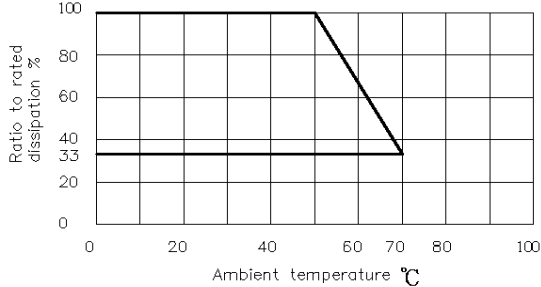
可选件 Option

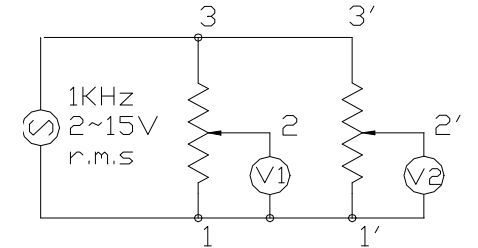


VERSION	深圳市亚特联科技有限公司 SHENZHEN YATELIAN TECHNOLOGY CO., LTD		MODEL: YSX-DWQ-P097-0673/B103N0A0V01AD15F7			DRAW	SCALE
A0			DRAWING NO:			宋工	3:1
. ISSU.	DATE	REVISION	Design	TOL. UNLESS OTHERWISE SPEC.		CHKD	UNIT
00	2020.1.15	Original		BASIC DIMENSIONS	TOL.	严工	mm
01				L ≤ 10	±0.3		
02				10 < L	±0.5	APPD	
03				100 ≤ L	±0.8		
04				ANGLE	±5°		第 1 页

YSX-DWQ-P097 SPECIFICATIONS 电位器规格书

一. ELECTRICAL CHARACTERISTICS 电气特性

序号 NO	项 目 ITEM	性 能 PERFORMANCE	测试条件 TEST CONDITIONS
1.1	Total resistance 全阻值	<u>10K</u> Ω	Between terminal 1 and terminal 3. 1-3 端子间.
1.2	TOTAL RESISTANCE TOLERANCE 全阻值允差	<u>±20%</u>	
1.3	Resistance taper 阻抗特性型式	“Resistance taper characteristics”. 见所附“阻型特性图”.	It should be tested at the position of 50% of the effective use angle. Percentage of the voltage of (C、E、RD type terminal 2-3 and other type terminal 1-2) to the voltage of terminal 1-3. 在有效使用角度的 50% 的位置测定, (C、E、RD 阻型其端子 2-3 脚, 其它阻型其端子 1-2 脚) 电压对端子 1-3 脚电压的百分比。
1.4	Rated power 额定功率	Single unit: ☒ Linear taper B: 0.05W ☐ Other taper 0.025W Dual unit: ☐ Linear taper B: 0.05W ☐ Other tapers : 0.025W 单联: ☒ B 型: 0.05W ☐ 其它阻型: 0.025W 双联: ☐ B 型: 0.05W ☐ 其它阻型: 0.025W	The rated power should be changed according to the following chart when the ambient temperature changed. 它与环境温度按以下曲线变化。 DERATING CURVE OF RATED DISSIPATION  DISSIPATION
1.5	Rated voltage 额定电压	☒ Linear taper B: AC50V、DC10V ☐ Other tapers : AC25V、DC10V ☒ B 型: AC50V、DC10V ☐ 其它阻型: AC25V、DC10V	E: 额定电压 Rated voltage (V) P: 额定电力 Rated power (W) R: 公称阻值 Normal total resistance (Ω) The rated voltage is calculated by above formula. When the rated voltage exceeds the maximum operating voltage, the maximum operating voltage should be the rated voltage. 额定电压按以上公式计算, 当额定电压超过最大工作电压时, 最大工作电压即为额定电压。
1.6	Sliding noise 噪声	Less than 100mV 小于 100mV	
1.7	Insulation resistance 绝缘阻抗	More than 100MΩ 100MΩ 以上	Measure insulation resistances between the individual terminals and metallic bushing with a DC250V insulation resistance tester. 金属轴套与端子间加 DC250V 电压测定。
1.8	Withstand voltage 耐电压特性	Without arcing or breakdown 无损坏或弧光	Apply AC 500V (50~60HZ) between specified terminals and metallic bushing for 1 minute. 在特定端子与金属轴套间加 AC500V (50~60HZ) 电压 1 分钟。
1.9	Residual Resistance 残留电阻值	Less than 20 Ω 小于 20 Ω	Resistance between terminal 1-2 and terminal 2-3 in full CW rotation and full CCW rotation. 轴以逆时针方向和顺时针方向旋转到底时 1-2 与 2-3 脚之阻值。
			It should be tested at the following drawing:

1. 10	Gang Error (Dual Unit) 同步误差(双联)	$-_{dB}\sim _{0dB}\sim _{4dB}$	按下图之方式测式之： 
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二. MECHANICAL CHARACTERISTICS 机械特性

序号 NO	项 目 ITEM	性 能 PERFORMANCE	测试条件 TEST CONDITIONS
2. 1	Total Rotation angle 全回转角度	300° ±10°	Angle from end 1 to end 3 从1 端到3 端的角度
2. 2	Rotational Torque 旋转力矩	10~80 gf.cm	Rotational speed 60° /sec 回转速度：60° /秒
2. 3	Number of detents (click) 旋转段位数目	☐ 1C(Center Detent 中段功能) ☐ 6C, ☐ 11C, ☐ 21C, ☐ 41C	For with-detent type. 加中段功能机种使用
2. 4	Click torque 段位推动力	☐ 50~ 250 gf.cm	For with-detent type. 加中段功能机种使用
2. 5	Rotation Stopper Strength 旋转止动强度	There should be no visual damage when maximum 4.0 Kgf.cm of torque are applied. 当其承受最大 4.0Kgf.cm 之扭力时，无明显破坏及损伤	Test duration: rotate to terminal 1 and terminal 3 specifically for 5±1 sec. 测试时间：旋转至 1 脚端和 3 脚端各 5±1 秒。
2. 6	Push-Pull Strength of Shaft 轴心推拔承受强度	There should be no broken when Maximally 8.0 Kgf of push strength and 5.0 Kgf pull strength are applied. 应用 8Kgf 的推力及 8Kgf 的拉力，无损伤	Test duration: 10 sec. of push force immediately followed by 20 sec. of pull force should be applied. Test point and direction: The strength should be applied to the top end of the shaft in axial direction. 测试时间：应用推力 10 秒钟后立即应用拉力为 20 秒钟；测试点及方向：测试点为轴心顶部，方向为轴向。
2. 7	Shaft play in axial direction 轴向间隙	0.4mm Max. 最大为 0.4mm	Apply 0.5kgf of force to the shaft in axial direction. 沿轴心轴向方向施加 0.5kgf 拉拔力。
2. 8	Shaft Wobble 轴心晃动	0.6XL/20mm Max. L—Shaft length L—轴心长度	0.6XL/20mm Max. L—Shaft length L—轴心长度
2. 9	Waterproof grade 防水 等级	☐ IP65 ☐ IP67	Between shaft core and shaft sleeve 轴芯与轴套之间

三. ENDURANCE CHARACTERISTICS 耐久性能

序号 NO	项 目 ITEM	性 能 PERFORMANCE	测试条件 TEST CONDITIONS
3. 1	Dry heat 耐热性	Variation of total resistance should be within +5% - 30%. To be operated mechanically. 全阻值变化要在+5% - 30%以内，机械方面能动作。	Test temperature:70±2℃ Test duration:240±8h Exposure to room temperature: 1h to 2h. 测试温度 70±2℃， 时间 240±8 小时， 室温保持 1 至 2 小时。
	Cold	The total resistance change should	The switch shall be stored at a temperature of -40±3℃ for

3.2	耐寒性	be within $\pm 20\%$. To be operated mechanically. 全阻值变化要在 $\pm 20\%$ 以内， 机械方面能动作	96 ± 4 H in a thermostatic chamber, And then the switch. Shall be subjected to standard atmospheric conditions for 1.5H, After which measurements shall be made. 测试温度 $-40\pm 3^{\circ}\text{C}$ ，无负载， 时间 96 ± 4 小时，室温保持 1 至 2 小时后测试
3.3	Damp heat 耐湿性	The total resistance change should be within 20%. To be operated mechanically. 全阻值变化要在 $\pm 20\%$ 以内。 机械方面能动作。	The change in resistance shall not exceed $\pm 10\%$ after cycle no for 1.5 hours off 0.5 hours, being repeated in a chamber at $40 \pm 2^{\circ}\text{C}$. 90 to 95 % R.H for 96 ± 2 consecutive, hours under rated voltage .subsequently being left for 5 hours and over at room temperature and humidity. 温度 $40\pm 2^{\circ}\text{C}$, 湿度 90~95%之恒温恒湿槽加上 1.5 小时额定电压后切 0.5 小时, 如此循环连续重复做, 96 ± 2 小时后, 在常温常湿之室内, 以无负载放置 5 小时之后。
3.4	Change of temperature 温度循环	The total resistance change should be within 10%. To be operated mechanically. 全阻值变化要在 $\pm 10\%$ 以内。 机械方面能动作。	温度 temperature 放置时间 1 $-25\pm 3^{\circ}\text{C}$ 30 分钟 2 常温 10to15 分钟 3 $70\pm 2^{\circ}\text{C}$ 30 分钟 4 常温 10to15 分钟 5 $-25\pm 3^{\circ}\text{C}$ 30 分钟 依上表连续循环 5 回, 去除表面水分在室温中置放 1 小时后测试。
3.5	Salt mist 盐雾试验	No apparent rust and discoloration 无明显锈迹, 无变色	Test should be made with temperature of $35\pm 2^{\circ}\text{C}$ and concentration of $5\pm 1\%$ (by weight) for 8 h. Then clean with water. 在温度为 $35\pm 2^{\circ}\text{C}$, 浓度 (重量比) 为 $5\pm 1\%$ 的条件下, 进行 8 小时连续喷雾后取出水洗。
3.6	Solder ability 焊锡性	Not less than 3/4 of the surface dipped shall be covered with new solder. 浸锡部分表面最少 3/4 被新锡覆盖。	Temperature of solder: $260\pm 5^{\circ}\text{C}$ duration: 3 ± 0.5 s. 焊锡温度 $260\pm 5^{\circ}\text{C}$ ，浸锡时间 3 ± 0.5 秒。
3.7	Resistance to soldering heat 焊锡耐热性	Variation of total resistance shall be within $\pm 5\%$, and terminals shall not work loose to injure electric contact, after test. 全阻值变化 $\pm 5\%$ 以内, 测试后无端子松动, 不会损坏电气接点。	Preheating condition: Surface temperature of the substrate shall be settled within 100°C in one min. 预热: 基板表面温度 100°C 以下, 1 分钟内。 Solder temperature $260\pm 5^{\circ}\text{C}$ for 5 sec. 焊锡温度 $260\pm 5^{\circ}\text{C}$ ，5 秒。 Manual soldering. 手焊 温度 350°C 以下, 时间 3 秒以内。 Bit temperature of soldering iron: 350°C less than application time of soldering iron: within 3S
3.8	Rotational life 旋转寿命	Standard life 标准寿命: Variation of total resistance should be within $\pm 20\%$, 全阻值变化 $\pm 20\%$ 以内。	测试速度 600 次/小时, 15000 次以上。 Test speed 600 times/hour, over 15000 times

四、Rotary switch specifications 旋转开关规格 ☐YES ☒NO

序号 NO	项 目 ITEM	性 能 PERFORMANCE	测试条件 TEST CONDITIONS
4.1	Contact resistance of switch. 开关接触电阻	Less than 50 mΩ 小于 50mΩ	Tested by contact resistance tester when switch is ON (1KHZ, 10mV, 5~50mA). 开关处于 ON 状态时，以 (1KHZ, 10mV, 5~50mA) 微电流接触阻抗计测定.
4.2	Switch Rated Power 开关额定功率	1.0A at DC 12V	Within 70℃ 小于 70℃
4.3	Insulation resistance 绝缘阻抗	More than 100 MΩ 100 MΩ 以上	Measure insulation resistances between the individual terminals and metallic bushing with a DC250V insulation resistance tester. 金属轴套与端子间加 DC250V 电压测定.
4.4	Withstand voltage 耐电压特性	Without arcing or breakdown 无损坏或弧光	Apply AC 300V(50~60HZ) between specified terminals and metallic bushing for 1 minute. 在特定端子与金属轴套间加 AC250V (50~60HZ) 电压 1 分钟.
4.5	Switch rotation angle 开关回转角度	50° ±10°	Angle from OFF to ON 从 OFF 到 ON 之间的角度
4.6	Switch action 开关作用力	150~350gf.cm	Torque from OFF to ON 从 OFF 到 ON 之间的扭力
4.7	Number of cycles 开关耐久次数	Contact resistance 1Ω Max, To be operated mechanically. 接触阻抗最大 1Ω, 机械方面能动作.	测试速度 600 次/小时, 15000 次以上。 Test speed 600 times/hour, over 15000 times

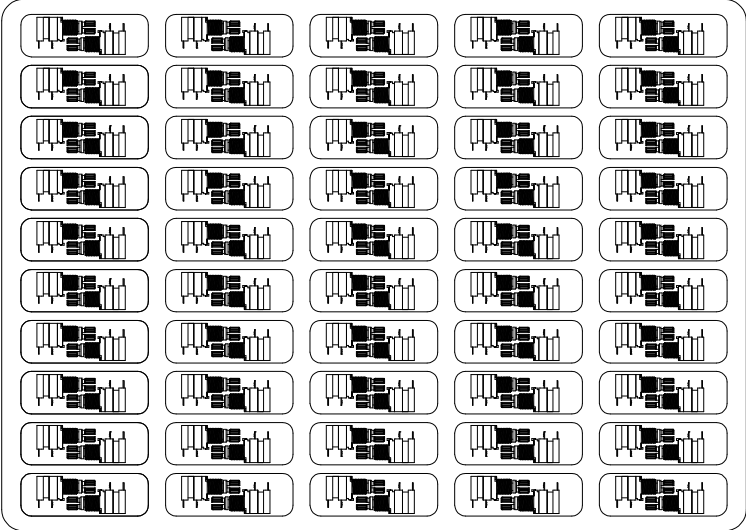
五、Push switch specifications 按压开关规格 ☐YES ☒NO

序号 NO	项 目 ITEM	性 能 PERFORMANCE	测试条件 TEST CONDITIONS
5.1	Contact resistance of switch. 开关接触电阻	Less than 50 mΩ 小于 50mΩ	Tested by contact resistance tester when switch is ON (1KHZ, 10mV, 5~50mA). 开关处于 ON 状态时，以 (1KHZ, 10mV, 5~50mA) 微电流接触阻抗计测定.
5.2	Switch Rated Power 开关额定功率	1.0A at DC 12V	Within 70℃ 小于 70℃
5.3	Insulation resistance 绝缘阻抗	More than 100 MΩ 100 MΩ 以上	Measure insulation resistances between the individual terminals and metallic bushing with a DC250V insulation resistance tester. 金属轴套与端子间加 DC250V 电压测定.
5.4	Withstand voltage 耐电压特性	Without arcing or breakdown 无损坏或弧光	Apply AC 300V(50~60HZ) between specified terminals and metallic bushing for 1 minute. 在特定端子与金属轴套间加 AC250V (50~60HZ) 电压 1 分钟.
5.5	Switch stroke 开关行程	0.5±0.3mm	Distance from OFF to ON 从 OFF 到 ON 之间的的距离
5.6	Switch action 开关按压力	500±100gf	Vertical downward pressure 垂直向下按压力
5.7	Number of cycles 开关耐久次数	Contact resistance 1Ω Max, To be operated mechanically. 接触阻抗最大 1Ω, 机械方面能动作.	测试速度 600 次/小时, 15000 次以上。 Test speed 600 times/hour, over 15000 times

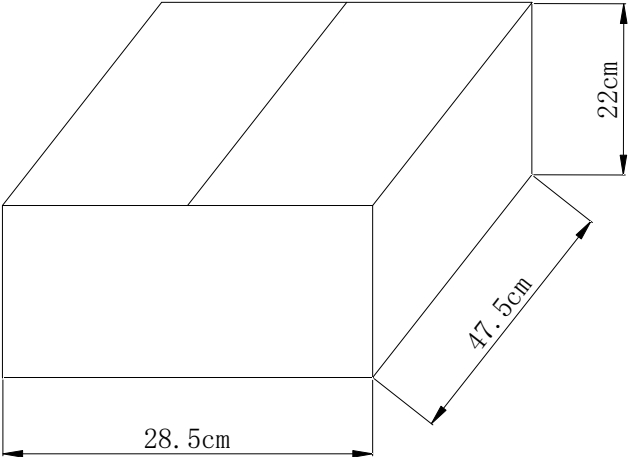
六. Packing Portion 包装部分

序号 NO	项 目 ITEM	性 能 PERFORMANCE	测试条件 TEST CONDITIONS
6.1	包装方式 Packing	使用吸塑盒和纸箱包装 Use plastic box and carton packaging.	每盒 100PCS, 每箱 30 盒 共计:3000PCS/箱 Put 100PCS products into foamed plastic plate, then pack 30plates into a carton, total 3000PCS/carton

内包装



外箱



七、General 一般事项

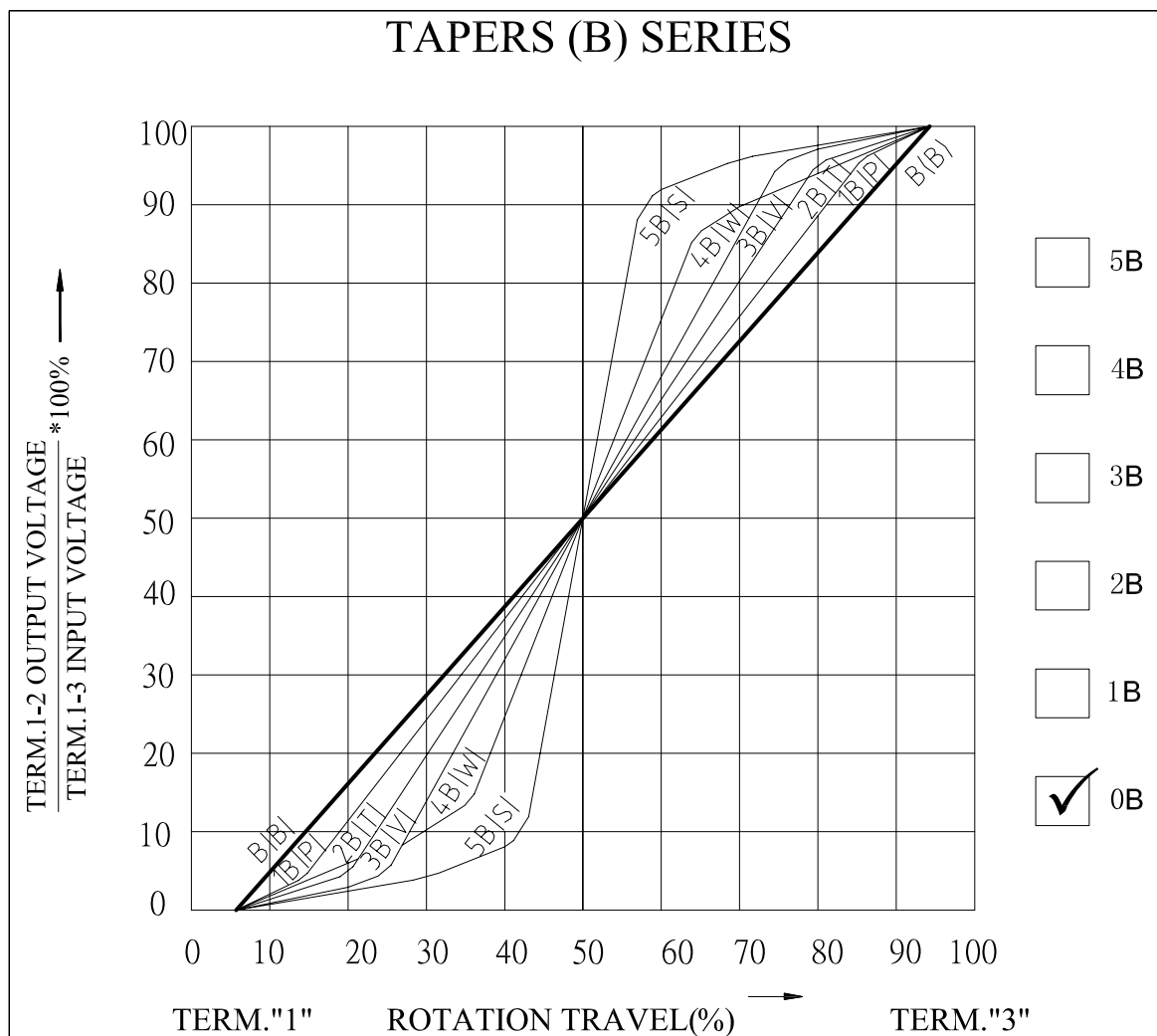
序号 NO	项 目 ITEM	
7.1	Unless otherwise specified, test and measurement should be carried out in following condition: 如无特殊要求, 试验与测试将按以下条件进行:	
	Ambient temperature 温度	15℃～ 35℃
	Relative humidity 相对湿度	25%~75%
	Air pressure 气压	86 KPa ～106 KPa
7.2	Operating temperature range 使用温度范围	-10℃~+70℃
7.3	Storage temperature range 储存温度范围	-25℃~+80℃
经 办 者 Design Dept		核 准 Approved
宋工		洪工

审 查 Q.I.Department	
严工	

Electrical Characteristics

Resistance Taper Characteristics

Resistance Taper Characteristics	Test Point Rotation (%)	$\frac{V_{1-2}}{V_{1-3}} \times 100\%$	$\frac{V_{2-3}}{V_{1-3}} \times 100\%$
A	60	15 ~ 30	————
B	50	40 ~ 60	————
C	60(Started From 3T)	————	15 ~ 30
D	50	2 ~ 15	————
E	50	————	15 ~ 35
W	30(± 5-Degree)	5 ~ 15	————
	50	40 ~ 60	————
	70(± 5-Degree)	85 ~ 95	————



電位器使用注意事項

POTENTIOMETERS USAGE ANNOUNCEMENTS

爲了在最穩定的條件下使用電位器，請注意以下因素對電位器的影響：

環境的影響：

- 1、環境溫度
當電位器周圍環境溫度高于70℃時，電位器的額定功率將大幅度下降。
電位器的旋轉（或滑動）操作力矩（或操作力）會隨溫度的升高而變輕，隨溫度的降低而變緊。如需在低溫下使用，請與我們聯系，我們備有適當的潤滑脂，可使旋轉力矩在低溫時正常化。
- 2、化學品
由于聚碳酸脂等合成樹脂在電位器中的應用，請不要將電位器與以下物品接觸：氨水、鹼水溶液芳香族碳氫化合物、滷素族碳氫化合物、酮類、脂類及其它強烈化學品等。
- 3、腐蝕性氣體
盡量避免在有害氣體中使用電位器，例如：SO₂、NH₃等，這些氣體會引起塑料或金屬材料的腐蝕。
- 4、結露
電位器表面應避免結露或有水滴存在，請勿在潮濕或易使電阻體等零件表面結露的地方使用電器，否則，可能會引起絕緣劣化或短路。

焊接條件及焊接方法的影響：

- 1、焊接作業時，若焊接溫度過高或時間過長，可能對電位器造成損壞。推薦的焊接條件爲：溫度260℃ ± 10℃，5S ± 0.5S內完成，焊接處離電位器本體1.5mm 以上。若采用鉻鐵焊接，請盡量考慮采用較低功率的電烙鐵，且在2秒鐘內完成。
- 2、盡量采用從PC板背面（電位器安裝面的反面）焊接；焊接時注意不要讓焊錫流穿線路板，以避免傳熱過快，對電位器造成損壞（見圖1）。

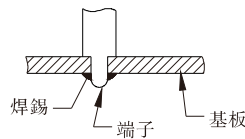


圖1A 正確

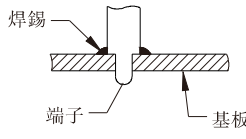


圖1B 不好

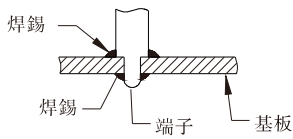


圖1C 不好

- 3、請注意避免助焊劑浸入電位器內部，否則將造成電刷與電阻體接觸不良，產生INT、雜音不良等現象。因此，若采用波峰焊，請在焊接前考慮適當的保護措施。
- 4、應避免使用水溶性助焊劑，否則將可能助長金屬氧化與材料發霉。
- 5、避免使用劣質焊錫，焊錫不良可能造成上錫困難，導致接觸不良或斷路。

安裝方法的影響：

- 1、當電位器是用螺母安裝于面板時，鎖緊螺母時應非常小心，鎖緊力矩不宜過緊，以避免破壞螺牙。
- 2、當需用螺釘安裝鐵殼型直滑電位器時，避免使用過長螺釘，否則有可能妨礙滑柄的運動，甚至直接損壞電位器本身。
- 3、在焊接或安裝過程中，不要對端子施加過大的力，否則可能引起接觸不良或機械損傷。盡量避免來回彎折端子，端子可能由于彎折兩周以上而折斷。
- 4、當給電位器套上旋鈕時，不要對軸施加過大的軸向推/拉力，其推/拉力不應超過產品《規格書》中所規定的軸的推/拉力參數指標。

電位器使用注意事項

POTENTIOMETERS USAGE ANNOUNCEMENTS

Usage Notice of Potentiometer

In order to use the potentiometer under the steadiest conditions, please pay attention to the influence of the following factors on the potentiometer:

Influence of the environment:

1. Ambient temperature
When the ambient temperature is over 70℃ , the rated power of the potentiometer will drop remarkably. The turning/sliding operating torque/force lessens with the rise of temperature and increases with the drop of it. If the potentiometer is to be used under low temperature, please contact us. We have special grease to normalize the turning torque under low temperature.
2. Chemicals
Since synthetic resins such as polycarbonate have been used in potentiometer, please keep the potentiometer away from the following substances: ammonia, alkaline solution, aromatic hydrocarbon, haloid hydrocarbon, ketone, lipid and other strong chemicals.
3. Corrosive gas
Avoid using the potentiometer in harmful gases such as SO₂, NH₃, which will lead to corrosion of plastics or metal.
4. Dew formation
Dew formation or water drops on the surface of potentiometers should be avoided. Don't use the potentiometer in humid places or where moisture can easily condense on element surface, otherwise, insulation deterioration or short-circuiting will take place.

Influence of soldering conditions and method

1. During soldering, the potentiometer may be damaged due to over temperature or long soldering time. The recommended soldering conditions are: temperature of 260℃ ± 10℃ , soldering time within 5S ± 0.5S seconds, and the soldering point should be at least 1.5mm from the main body of the potentiometer. If soldering iron is used, please choose electric soldering iron of lower power and finish soldering in 2 seconds.
2. Do the soldering from the back of the PC board, i.e. the back of the mounting side of the potentiometer; no solder should be allowed to flow through the circuit board in order to prevent the heat from transferring too quick and damaging the potentiometer (see figure 1).

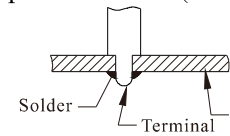


Figure 1A Correctly

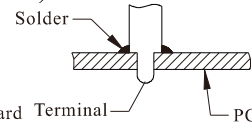


Figure 1B Wrong

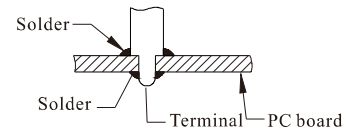


Figure 1C Wrong

3. Please pay attention that no soldering flux is allowed to infiltrate into the potentiometer, otherwise, there will be poor contact between brush and the resistor, and leading to INT damaging, noise, etc. Therefore, if wave soldering is employed, please adopt proper precautions.
4. Water-soluble soldering flux should be avoided. Otherwise, metal oxidation and mould development on materials will be aggravated.
5. Avoid using solder of poor quality, which may lead to difficulty in applying the solder, and resulting in poor contact or open circuit.

Influence of mounting method:

1. When the potentiometer is fixed onto the board by nut, be careful when tightening the nut. The tightening torque should not be too high to prevent damaging the screw thread.
2. When screw is needed for mounting shell type sliding potentiometer, avoid screws of excessive length, otherwise the movement of the sliding bar may be hindered even the potentiometer be damaged.
3. Don't exert too much force on terminals during soldering or mounting, otherwise, poor contact even mechanical damage may be found. Avoid bending terminals back and forth because the terminal may break due to two circles of bending or more.
4. When assemble the knob, don't exert over axial pushing/pulling force on the shaft. The force must not exceed the shaft pushing/pulling force set in the Specification Table.

電位器使用注意事項

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存儲條件

- 1、禁止存放于高溫、高濕及腐蝕性氣體中。
- 2、當您需要長期存放時,不要開封。
- 3、保持先進先出原則。

關於綫路設計及布局結構設計的幾點建議：

- 1、由于電阻值的存在，電位器在外加負荷下會產生一定的熱量。在您設計時請加以考慮。
- 2、最好能將電位器當作四端組件作調整電壓的分壓器使用，且接綫方式宜選擇“1”端接地，同時電位器的負載電阻Rl應不小于電位器公稱阻值Rt的10倍。（見圖2A）
除爲了特別設計的需要，應避免將電位器當作二端組件作變阻器使用。因爲電阻體與接觸片間的接觸電阻不利大電流的通過，同時，由于僅使用了有效行程的一部分，如果動觸點電流過大，可能造成局部過載而失效。（見圖2B）

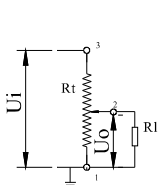


圖2A 作分壓器（推薦）

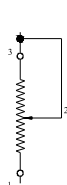


圖2B 作變阻器（不推薦）

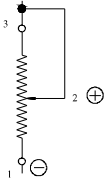


圖3 正極接電刷

- 3、當電位器在直流電路中作爲電流調節使用時，將有直流電流通過電位器的滑動臂。此時由于陽極氧化的原因會導致電阻值異常增加。在這種情況下，建議將電阻體的引出端子接負極，將滑動臂的引出端子接正極。（見圖3）
- 4、盡管電阻體兩極是印刷銀層，但爲了提高抗硫化的可靠性，通常在電阻體的兩極覆蓋一層碳膜，此時其終端電阻可能會偏高，如果希望低終端電阻，請與我們聯系。
- 5、對電位器旋轉止檔施加過大的扭力可能會引起機械性損壞。因此，對於旋轉類電位器請盡量配用外徑較小的旋鈕，以使止檔受到的力矩盡量減小。
- 6、對於轉軸類電位器，請適當考慮當使用者調節電位器時能用拇指與食指從兩個方向捏住電位器軸柄上的旋鈕進行旋轉。因爲旋轉時軸柄受力越均勻，則軸的晃動越小，電刷與電阻體間的接觸也越可靠。（見圖4）

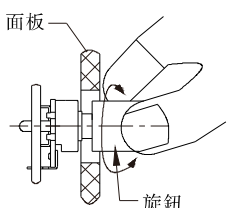


圖4A 推薦

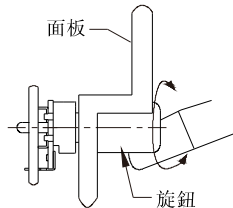


圖4B 不推薦

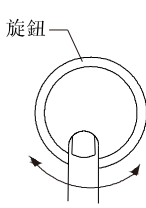


圖4C 不推薦

- 7、面殼上爲電位器調節旋鈕而預留的安裝孔的直經，在設計時請留足夠的配合間隙，因爲旋鈕的同軸度偏差及電位器軸柄晃動量的影響，若配合過于緊密，易產生旋鈕與面殼刮擦的現象。（見圖5）
- 8、直滑電位器的滑柄長度或旋轉類電位器的軸柄長度，在選擇時，如果條件許可，盡可能采用較短的滑柄(或轉軸)，滑柄(或轉軸)越短則手感越穩定，滑柄（或轉軸）搖晃也越小。（見圖6）

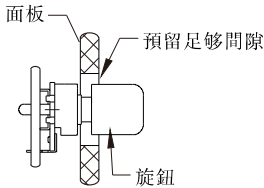


圖5 注意旋鈕與面殼刮擦

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Storage conditions

1. High temperature, high humidity or corrosive gases are prohibited in storage.
2. Don't open the seal when long-term reservation is needed.
3. Keep the principle of “irst come, first use” ..

Suggestions on circuit design and layout:

1. Because of the existence of resistance value, the potentiometer will produce heat quantity under applied load. Please take this into account during design.
2. The best way is to use the potentiometer as a four-terminal element for adjusting voltage of voltage divider. For wiring, you'd better choose terminal “1” for grounding and Rl (the load resistance of the potentiometer) should be not smaller than ten times as Rr (the nominal resistance).
Except for special design requirement, the potentiometer shouldn't be used as a two-terminal rheostat. The contact resistance between the resistor and the contact piece will hinder the passing of big electric current, at the same time, the current at the moving contact may be too big since only part of the effective travel is in function and lead to local over loading then failure of the unit. (See figure 2B)

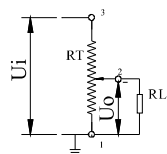


Figure 2A
used for vottage divider(recommended)

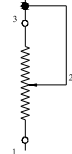


Figure 2B
used for rheostat (no recommended)

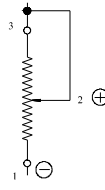


Figure 3C
The anode has been bonded with bnsh

3. When the potentiometer is used as current regulator in DC circuit, DC current will pass the sliding arm thus resistance value will rise abnormally because of anodic oxidation. In this case, it is recommended to connect the leading-out terminal of the resistor to the cathode and that of the sliding arm to anode. (See figure 3)
4. Although both poles of the resistor are covered by printed silver layer, normally a carbon film is applied on the pole in order to improve reliability of sulfide resistance, and causing a comparatively high terminal resistance. If lower terminal resistance is needed, please contact us.
5. Too much twisting force on the limit stop of the turning knob may give rise to mechanical damage. Therefore, please choose knob of smaller outside diameter to minimize torque on the stop.
6. For shaft type potentiometer, please make proper design to enable the user to turn the knob on shaft handle by hold the knob with thumb and forefinger from two different directions. The reason is that when force on the shaft handle is evenly applied, the shaft will be more steady and contact between the brush and the resistor will be more reliable. (See figure 4)

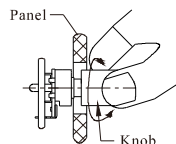


Figure 4A Recommended

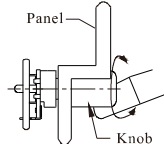


Figure 4B No recommended

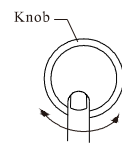


Figure 4C No recommended

7. Sufficient fitting clearance should be arranged when calculating the diameter of the mounting hole prepared for the adjusting knob in the panel. Too tight fitting, together with deviation of knob centerline and unsteadiness of the shaft handle will cause scraping and friction between the knob and the panel. (See figure 5)

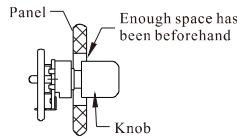
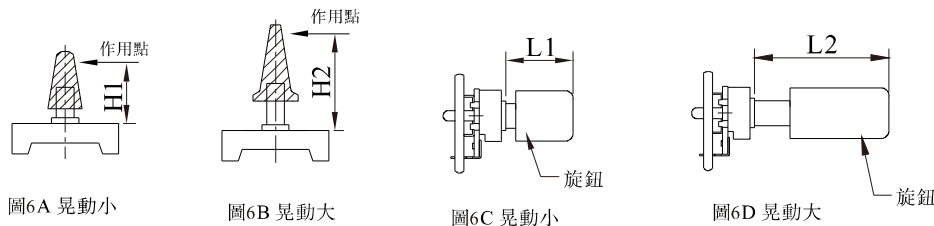


Figure 5 Prerent knob form scuffing panel

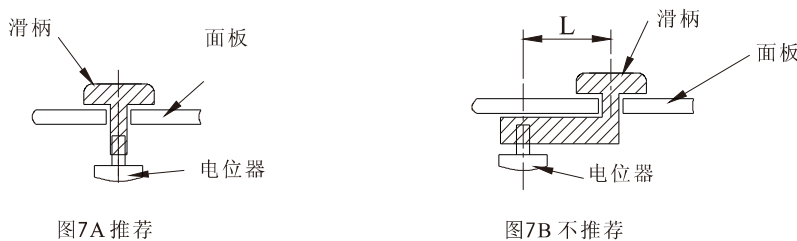
8. When select the sliding handle for sliding type potentiometer or shaft handle for the turning type, choose as short as possible. When the handle becomes shorter, the handling and the movement become steadier. (see figure 6)

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9、直滑電位器的滑柄驅動機構，若操作作用點偏離滑柄之中心綫是不合適宜的。距離L越短，所獲得的滑動手感則越好。請盡量考慮採用使驅動件的中心綫與滑柄的中心綫重合的驅動機構。（見圖7）



10、對於帶開關電位器，請在開關額定功率範圍內使用，不要將大功率開關做小電流通、斷開關來使用。例如：5A的開關不宜在1mA的工作電流中使用。建議用儀表實測或計算的方法來檢查浪涌電流，如果浪涌電流太大，即使常規電流很小，也會出現融化或其它問題。

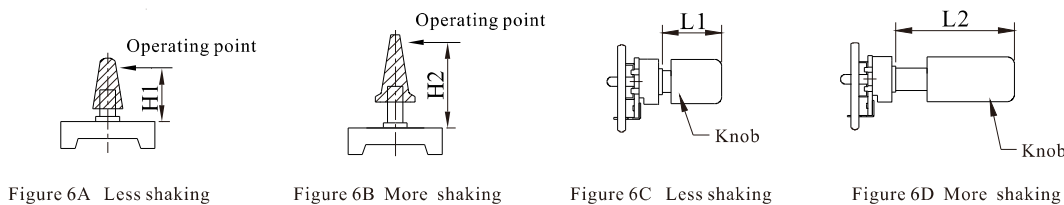
關於訂貨的建議：

當您選擇電位器時，請注意以下幾點：

- 1、外形尺寸或名稱；
- 2、用途；
- 3、標稱阻值及允許偏差；
- 4、阻值变化特性；
- 5、有無軟定位；
- 6、額定功率或最高工作電壓；
- 7、由于持續改進或其它方面的原因，產品實物的名稱、外形尺寸和性能指標等可能與此產品目錄中所列有所不同，如有變更之處，請以送樣時附送的《規格書》中的外形圖和指標參數為準。

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9. For driving unit of the sliding handle in sliding type potentiometers, it is not proper to allow displacement between the contact spot and the centerline of the handle. The smaller distance L is, the better the sliding control by hand will be. You'd better use a driving unit in which the driving piece and the handle has the same centerline. (See figure 7)



10. For potentiometers with switches, please use it within the rated power of the switch. Don't use a high power switch as small current circulation and on-and-off switch. For example, switch of 5A is not suitable to be used under 1mA working current. It is recommended to check the surge current by actual measurement or calculation. If surge current is too big, problems such as melting will occur even the regular current is small.

Suggestions for order

When choosing potentiometers, please pay attention to the following items:

1. External dimensions and designation.
2. Usage.
3. Nominal resistance value and permissible deviation.
4. Regular pattern of resistance.
5. Whether soft positioning is provided.
6. Rated power or maximal operational voltage.
7. Because of constant improvement or other reasons, the designation, external dimensions and performance index of the actual products may be different from that in this catalogue. For any change, please see the external figure and parameters in the Specification Table attached to the sample.