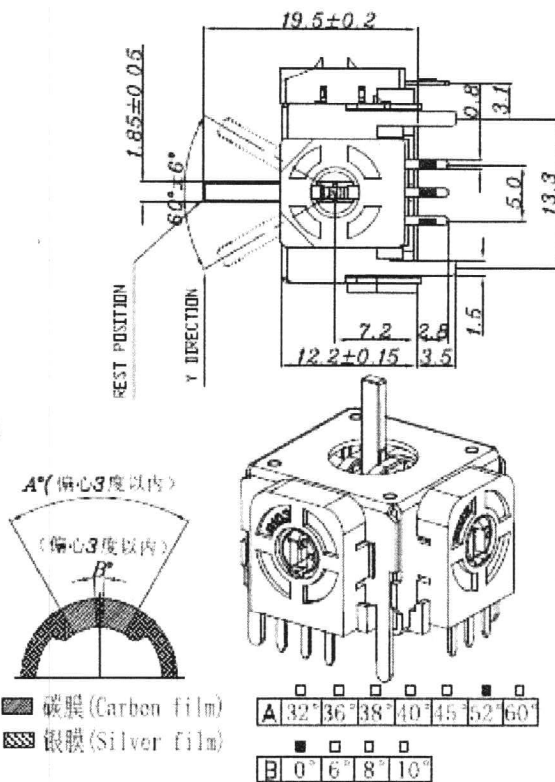
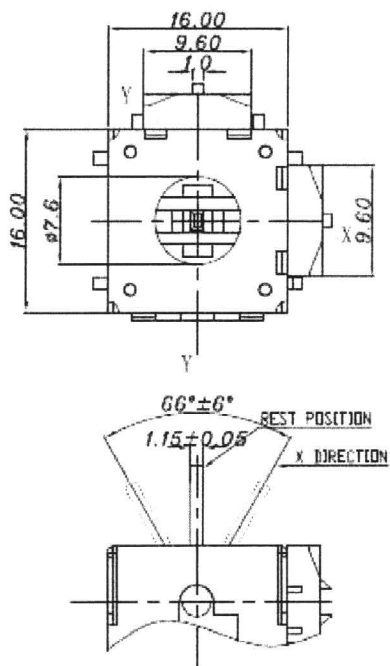
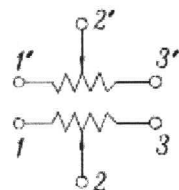


MECHANICAL DIMENSIONS

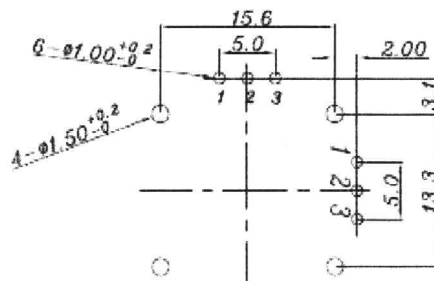


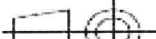
接線圖

Circuit Explanation



安裝孔位圖
Mounting Hole



TOLERANCE UNLESS OTHERWISE STATED		PRODUCT NO.		3D161-1H-XXX-52A				
LESS THAN 10 ±0.3		PC NO.						
ABOVE 10 LESS THAN 30 ±0.5								
ABOVE 30 ±1.0								
ANGLE ±5°		DRAW NO.		END-DG		UNIT	MM	PROJECTION
DEVISION	REVISION NOTE	DATE	DE. BY	CH. BY	AP. BY			
A/O	新版發行	09.06.25	Z G W					

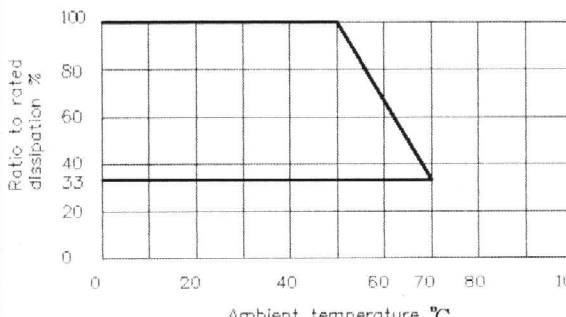
POTENTIOMETER SPECIFICATIONS

規格書

型號名稱 Model Name : 3D161-1H-B10K-52A±8%

一、ELECTRICAL CHARACTERISTICS 電氣特性

日期:2018 年 05 月 30 日

序號 NO.	項 目 ITEM	性能 PERFORMANCE	測試條件 TEST CONDITIONS
1	Total Resistance 全阻值	<input type="checkbox"/> 5K±20% <input checked="" type="checkbox"/> 10K±8% <input type="checkbox"/> 50K±20% <input type="checkbox"/> 100K±20%	Between terminal 1 and terminal 3. 1-3 端子間。
2	Resistance taper 阻抗特性型式	TypeB ; Refer to attached drawing “Resistance taper characteristics” B 型: 見附頁 “阻型特性圖”	Percentage of the voltage of terminal 1-2 to the voltage of terminal 1-3. 端子 1-2 電壓對端子 1-3 電壓的百分比。
3	Rated voltage 額定電壓	Linear TaperB: AC 50V DC 5V B 型: AC 50V DC 5V	$E = \sqrt{PR}$ E: 額定電壓 Rated voltage (V) P: 額定功率 Rated power (W) R: 公稱全阻值 Nominal 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. 額定電壓按以上公式計算, 當額定電壓超過最 大工作電壓時, 最大工作電壓即為額定電壓。
4	Rated power 額定功率	Linear TaperB: 0.0125W B 型: 0.0125W	The rated power should be changed according to the following chart when the ambient temperature changed. 它與環境溫度按以下曲線變化。 

5	Contact Noise 接觸雜音 (CRV)	<p>5% or less of the total resistance ofr over 60° (60° included) carbon film angle (Before the life test);</p> <p>10% or less of the total resistance for 40° thru 60° carbon film angle (Before the life test);</p> <p>15% or less of the total resistance for under 40° (40° included) carbon film angle (Before the life test);</p> <p>碳膜角度為 60° (含) 以上時, 全阻值的 5% 以下 (壽命測試前);</p> <p>碳膜角度為 40° ~60° 時, 全阻值的 10% 以下 (壽命測試前);</p> <p>碳膜角度為 40° (含) 以下時, 全阻值的 15% 以下 (壽命測試前)。</p> <p>7% or less of the total resistance for over 60° (60° included) carbon film angle (After the life test);</p> <p>12% or less of the total resistance for 40° thru 60° carbon film angle (After the life test);</p> <p>18% or less of the total resistance for under 40° (40° included) carbon film angle (After the life test);</p> <p>碳膜角度為 60° (含) 以上時, 全阻值的 7% 以下 (壽命測試後);</p> <p>碳膜角度為 40° ~60° 時, 全阻值的 12% 以下 (壽命測試後);</p> <p>碳膜角度為 40° (含) 以下時, 全阻值的 18% 以下 (壽命測試後)。</p>	<p>By the test angle of less than 90% carbon film angle.</p> <p>測試角度小於碳膜角度的 90%。</p>
6	Voltage Divider Error 分壓誤差值	42.5%~57.5%	<p>Voltage divider error is defined the ratio of the voltage terminals 1-2 to terminals 1-3 after the drive arm rested. 5V D.C. shall be applied to the terminals between 1 and 3 and then voltage divider error shall be measured with the drive arm operation on the line X-X and Y-Y. (Terminal 1-2/Terminal 1-3 × 100%</p> <p>分壓誤差值是搖杆自由復位後端子 1-2 與端子 1-3 電壓比例。將 5V D.C. 電壓加在端子 1-3 之間, 分壓誤差值在搖杆運作於 X-X 和 Y-Y 方向到底復位後測試。(端子 1-2/端子 1-3 × 100%)</p>

7	Contact resistance 接觸阻抗 (ENR)	<p>10% or less of the total resistance over 60° (60° included) carbon film angle (Before the life test);</p> <p>15% or less of the total resistance for 40° thru 60° carbon film angle (Before the life test);</p> <p>20% or less of the total resistance for under 40° (40° included) carbon film angle (Before the life test);</p> <p>碳膜角度為 60° (含) 以上時, 全阻值的 10% 以下 (壽命測試前);</p> <p>碳膜角度為 40° ~ 60° 時, 全阻值的 15% 以下 (壽命測試前);</p> <p>碳膜角度為 40° (含) 以下時, 全阻值的 20% 以下 (壽命測試前)。</p> <p>15% or less of the total resistance for over 60° (60° included) carbon film angle (After the life test);</p> <p>20% or less of the total resistance for 40° thru 60° carbon film angle (After the life test);</p> <p>25% or less of the total resistance for under 40° (40° included) carbon film angle (After the life test);</p> <p>碳膜角度為 60° (含) 以上時, 全阻值的 15% 以下 (壽命測試後);</p> <p>碳膜角度為 40° ~ 60° 時, 全阻值的 20% 以下 (壽命測試後);</p> <p>碳膜角度為 40° (含) 以下時, 全阻值的 25% 以下 (壽命測試後)。</p>	<p>By the test angle of operation angle.</p> <p>測試角度為全運轉角度。</p>
8	Insulation Resistance 絕緣阻抗值	<p>More than 100 MΩ</p> <p>100MΩ 以上</p>	<p>Apply 250VDC to the individual terminals and case.</p> <p>金屬外殼與端子間加 DC250V 電壓</p>
9	Withstand Voltage 耐電壓特性	<p>Without arcing or breakdown</p> <p>無損壞或弧光</p>	<p>Apply one minute of 250VAC to the individual terminals and case.</p> <p>在特定端子與外殼間加 AC250V 電壓 1 分鐘。</p>

二、MECHANICAL CHARACTERISTICS 機構特性

序號 NO.	項 目 ITEM	性 能 PERFORMANCE	測試條件 TEST METHODS AND REFERENCE
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1	Figure of lever Operation 搖杆動作形式	The horizontal type 橫向式	/
2	The stopper strength of the lever 搖杆止動強度	More than 3. 1Kgf 3 seconds min 大於 3. 1Kgf ' 至少 3 秒鐘	Apply side force on the lever perpendicular to the lever' s axial direction. 垂直于搖杆的力作用於搖杆上。
3	Push Strength of lever 搖杆拉拔強度	More than 5.0 Kgf 3 seconds min 大於 5. 0Kgf ' 至少 3 秒鐘	Apply specified pull force on the lever upward. 作用於搖杆上，沿搖杆方向向上。
4	Push Strength of lever 搖杆推強度	More than 3. 0 Kgf 3 seconds min 大於 3. 0Kgf ' 至少 3 秒鐘	Apply specified push force on the lever downward. 作用於搖杆上，沿搖杆方向向下。
5	Operating force of lever 搖杆作用力	□80±120 gf ■130±80 gf □180±240 gf	Test position: More than 10 degrees deflection of lever. 搖杆偏斜 10 度以上之位置測定。
6	Accuracy of Reset position of lever 搖杆復位精度	±5°	Measure the angle between the lever, and the axial center line after the lever pushed to the direction of X-X (Y-Y) and resets. 搖杆推向 X-X (Y-Y) 方向自由復位後測搖 杆與垂直中心線的角度。
7	Operation angle of lever 搖杆使用有效角度	Refer to attached product Drawing 見成品圖	The maximum angle of the lever pushed to the direction of X-X and Y-Y and 45° 搖杆推向 X-X (Y-Y) 和 45° 方向的最大角 度。
8	3D161 搖杆扳動角度与碳膜旋轉角度的关系为 1:0. 96~1		

三、ENDURANCE CHARACTERISTICS 耐久性能(Single test of item 單一測試項目)

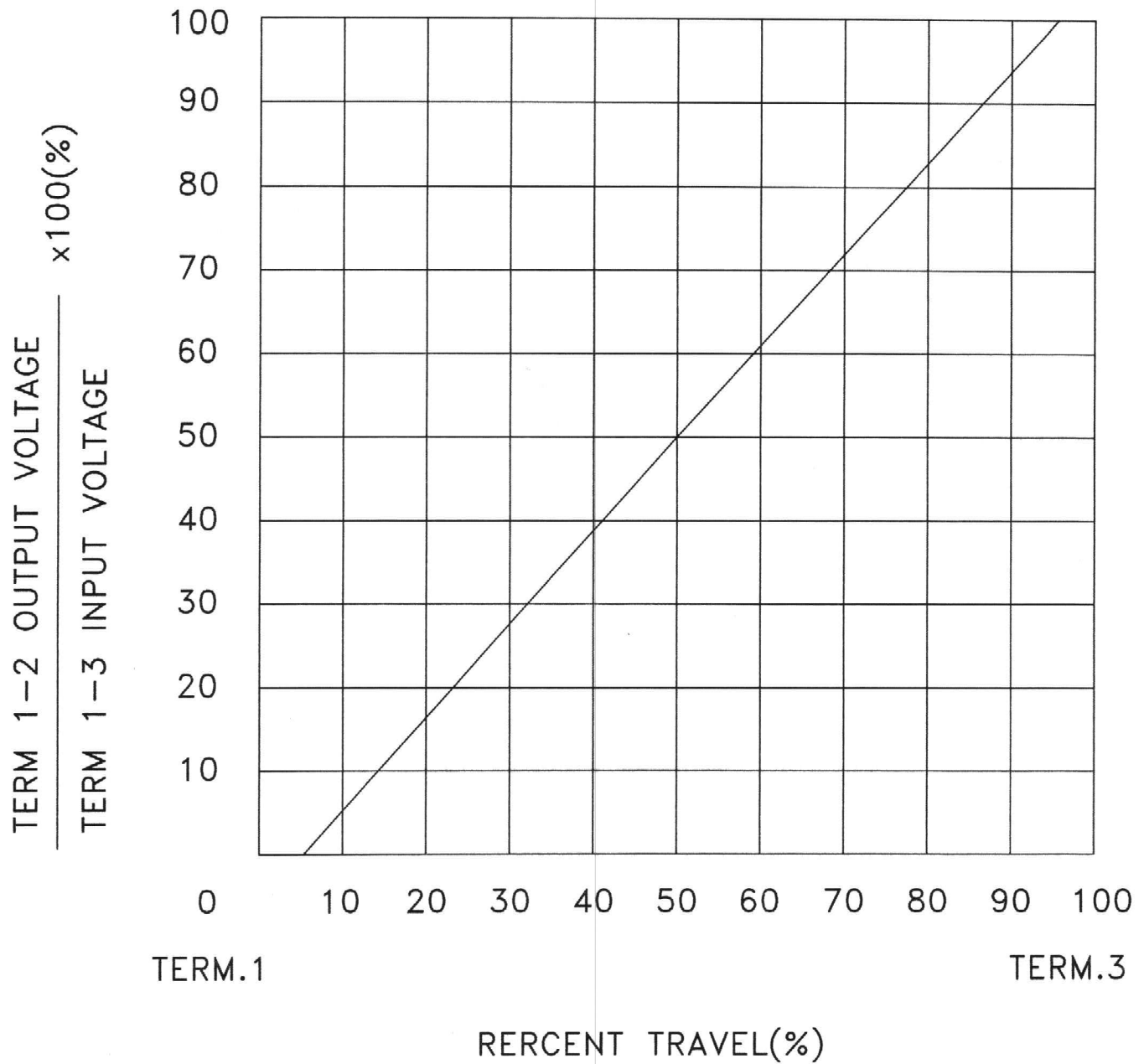
序號 NO.	項 目 ITEM	性 能 PERFORMANCE	測試條件 TEST CONDITIONS
1	Free falling 自由落下試驗	No damage and lever deformation, but deformations of terminals and molded parts are allowed. 無不良產生，端子變形除外。	Height: 75cm Number of falls: 3 times 從高度為 75 釐米落下測試 3 次後。

2	Dry heat 耐熱性	Variation of total resistance should be within +5%/-30% To be operated mechanically. 全阻值變化要在+5%/-30% 以內，機械方面能動作。	Temperature: $80 \pm 2^{\circ}\text{C}$ Time: 96 hours The controller shall be subjected to standard atmospheric conditions for 2 hours after which measurement shall be made. 溫度在 $80 \pm 2^{\circ}\text{C}$ 放置 96 小時。2 小時後正常狀態下測試。
3	Cold 耐寒性	The total resistance change should be within $\pm 20\%$. To be operated mechanically. 全阻值變化要在 $\pm 20\%$ 以內，機械方面能動作。	Temperature: $-30 \pm 2^{\circ}\text{C}$ Time: 96 hours Surface moisture shall be removed, and then the controller shall be subjected to standard atmospheric conditions for 2 hours after which measurement shall be made. 溫度在 $-30 \pm 2^{\circ}\text{C}$ 放置 96 小時，表面水份攝取後 2 小時正常狀態下測試。
4	Damp heat 耐濕性	Insulation resistance: more than $10\text{M } \Omega$ with 250V insulation resistance tester. The total resistance change should be within $\pm 20\%$. To be operated mechanically. 用 250V 絕緣測試機測試，絕緣阻抗 $10\text{M } \Omega$ 以上，全阻值變化要在 $\pm 20\%$ 以內，機械方面能動作。	Temperature: $60 \pm 2^{\circ}\text{C}$ Humidity: 90~95%RH Time: 96 hours Surface moisture shall be subjected to standard atmospheric conditions for 2 hours after which measurement shall be made. 溫度在 $60 \pm 2^{\circ}\text{C}$ 放置 96 小時，表面水份攝取後 2 小時正常狀態下測試。
5	Temperature cycling test 溫度循環測試	The total resistance change should be within. $\pm 20\%$ To be operated mechanically. 全阻值變化要在 $\pm 20\%$ 以內，機械方面能動作。	Low temperature: $-10 \pm 3^{\circ}\text{C}$ 30 minutes High temperature: $+60 \pm 2^{\circ}\text{C}$ 30 minutes Number of cycles: 5 Surface moisture shall be removed, and then the controller shall be subjected to standard atmospheric conditions for 2 hours after which measurement shall be made. 在低溫為 $-10 \pm 3^{\circ}\text{C}$ 放置 30 分鐘，高溫 $60 \pm 2^{\circ}\text{C}$ 放置 30 分鐘，測試 5 次，表面水份攝取後 2 小時後正常狀態下測試。
6	Resistance to Soldering 焊錫性	Not less than 3/4 of the surface dipped shall be covered with new solder. 浸錫部分表面最少 3/4 被新錫覆蓋。	Temperature of solder: $235 \pm 5^{\circ}\text{C}$ Dipping duration: $3 \pm 0.5\text{S}$ 焊錫溫度: $235 \pm 5^{\circ}\text{C}$ 浸錫時間: 3 ± 0.5 秒

7	Resistance to soldering heat 焊錫耐熱性	Variation of total resistance shall be within $\pm 5\%$, and terminals shall not work loose to injure electric contact, after test. 全阻值變化 $\pm 5\%$ 以內，測試後無端子鬆動，不會損壞電氣接點。	Soldering temperature 260 ± 5 °C for 5 sec. 焊錫溫度 260 ± 5 °C，5 秒。
8	Number of Cycles 耐久次數值	Total resistance \leq Initial value $\pm 20\%$. No mechanical malfunction. 全阻值變化 \leq 初始值 $\pm 20\%$ 。 機械方面能動作。	500, 000 Cycles min

STANDARD RESISTANCE TAPER

OB TAPER



Notes: Percent Voltage
Check Point

50% Travel From Term.3

Tolerance

40~60%