Customer: ALPS EUROPE DISTRIBUTION

No. KK-2009-7346

Date: Mar. 03, 2009

Attention:

Your ref. No.:

Your Part No.: RK50112A

SPECIFICATIONS

ALPS' ;

MODEL: RK50112A000J
(10kAX2)

Spec. No.:

Sample No.: F 7 4 8 3 9 8 4 M

RECEIPT STATUS

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ALPS
ALPS ELECTRIC CO., LTD.

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Q1003#03A (EA)

No. KK-2009-7346

S P E C I F I C A T I O N S

1. THIS SPECIFICATIONS APPLY TO RK50112A000J POTENTIOMETER.

2. CONTENTS OF THIS SPECIFICATIONS.
   4K5021-2
   K50210001

3. MARKING
   • MARKING ON ALL UNITS
   DATE CODE, RESIST. VALUE, TAPER

4. REMARKS
   • FURNUSH PACKAGE
   NUT:1 WASHER:1 (H=14)
   • NOTES
   ·Marking ⇒ in specifications shows standard and condition for application.

• CAUTION

There is a possibility that might be affected by contact resistance of resistive element and wiper in case of low impedance of output side in voltage regulation circuit.
For this reason, we require that you adjust to impedance of output side more than 100 times of total resistance.

1.For the export of products which are controlled items subject to foreign and domestic export laws and regulations, you must obtain approval and/or follow the formalities of such laws and regulations.

2.Products must not be used for military and/or antisocial purposes such as terrorism, and shall not be supplied to any party intending to use the products for such purposes.

3.Unless provided otherwise, the products have been designed and manufactured for application to equipment and devices which are sold to end-users in the market, such as AV (audio visual) equipment, home electric equipment, office and commercial electronic equipment, information and communication equipment or amusement equipment. The products are not intended for use in, and must not be used for, any application of nuclear equipment, driving control equipment for aerospace or any other unauthorized use.
With the exception of the above mentioned banned applications, for applications involving high levels of safety and liability such as medical equipment, burglar alarm equipment, disaster prevention equipment and undersea equipment, please contact an Alps sales representative and/or evaluate the total system on the applicability. Also, implement a fail-safe design, protection circuit, redundant circuit, malfunction protection and/or fire protection into the complete system for safety and reliability of the total system.

4.Before using products which were not specifically designed for use in automotive applications, please contact an Alps sales representative.

5.The products shall be stored in the original packaging and kept at room temperature and humidity, out of direct sunlight, and away from any and all corrosive gas. The products shall be completely used as soon as possible, but no later than 6 months from the date of delivery.

Once product packaging is opened, the complete quantity of such products shall be promptly used.

1. Scope 適用範囲

This specification applies to potentiometer with carbon composition resistor, used in electronic equipment.

この仕様書は電子機器一般に用いられる炭素系抵抗体を用いた可変抵抗器について規定する。

Rotational 回転形 (1 shaft 軸 , 2 story 連)

2. construction 構造

2.1 Dimensions and materials 寸法・材料

Refer to the attached 別紙参照

SYMB	DATE	APPD	CHKD	DSGD

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APPD.	CHKD.	DSGD.
1一設2課 '94.6.7 佐藤	1一設2 '94.6.06 川崎	1一設2 '94.6.03 神崎

TITLE ROTATIONAL POTENTIOMETER
回転形可変抵抗器

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3. Characteristics 性能

Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:

Ambient temperature : 15℃ to 35℃
Relative humidity : 25% to 85%
Air pressure : 86kPa to 106kPa

If there is any doubt about the results, measurements shall be made within the following limits:

Ambient temperature : 20±1℃
Relative humidity : 63% to 73%
Air pressure : 86kPa to 106kPa

○標準状態
特に指定がない限り測定は常温(温度15~35℃), 常湿(湿度25~85%), 常気圧(気圧86~106kPa)にて行う。

ただし, 判定に疑義を生じた場合は温度20±1℃, 湿度63~73%, 気圧86~106kPaにて行う。

Temperature for operating and storage

Dimensions:See attached drawing
Operating temperature:-10°C~+70°C
Storage temperature: -20°C~+80°C

○一般性能
形状, 寸法は組立図による。
使用温度範囲:-10°C~+70°C
保存温度範囲:-20°C~+80°C

3.1 Mechanical characteristics 機械的性能

	Item 項目	Conditions 条件		Specifications 規格
1	Total mechanical rotation 全回転角度	Angle of effective rotation 有効回転角度		300° ±3°
2	Rotational torque 回転トルク	Rotational speed 回転速度 S 60°/秒	Standard atmospheric conditions 常温15°C to 35°C	28±15 mN·m
			0 ℃±2°C	100 mN·m or less
			+50 ℃±2°C	13 mN·m or more
3	Terminal strength 端子強度	A static load of 5 N shall be applied to the terminals for 10 s in any direction. 任意の一方向に5Nの静荷重を10秒間加えた後測定する。		Without excessive play in terminals or poor contact 著しいガタ, および接触不良を生じないこと。
4	End stop strength ストッパー強度	The following torsion moment load of 1.5Nm shall be applied to the shaft for 10s at both ends. 軸に150mN·mのネジリモーメントを両端末にそれぞれ10秒間加えた後測定する。		Without damage to , or play in, shaft. No abnormality in rotational torque. Electrical characteristics shall be satisfied. 回転トルク, 軸のガタ, 回転角度に異常がなく電気的特性を満足すること。
5	Bending or play in shaft 軸の曲りおよびガタ	A momentary load of 100mN·m shall be applied at the point 5 mm from the tip of the shaft in a direction perpendicular to the axis 軸先端より5mm の位置に100mN·mのモーメントを軸と直角に加え軸の曲がりを測定する. 但し反対位置からもモーメントを加え両方の値をたすこととする。		→

Shaft length 軸長(mm)	mm p-p or less 両側(mm)
20	0.2以下
25	0.25以下
30	0.3以下
35	0.35以下
40	0.4以下

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初設	94-8-30	佐藤	川崎	神崎

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APPD.	CHKD.	DSGD.
1技-2G '00.7.06 相沢	1技-2G '00.7.06 佐々木(利)	1技-2G '00.7.-6 鈴木

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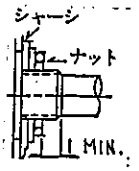
	Item 項目	Conditions 条　　件	Specifications 規　　格
6	Thrust and tensile shaft 軸の押しおよび引張り強度	Thrust and tensile static load of 150N shall be applied to the shaft in the axial directions for 10 s. 軸の押し方向および引張方向に150Nの静荷重を10秒間加える。	Without damage to, or play in, shaft. No abnormality in rotational torque Electrical characteristics shall be satisfied. 軸のガタ，および破損，回転トルクに異常がなく，電気的性能を満足すること。
7	Nut tightening strength ナット締付強度	Installation torque of 2N·m shall be applied to tighten the nut. However, the upper part of the nut shall be set 1.0mm or more lower than upper part of the bushing. 2N·mのトルクでナットを締付ける。ただし，ナット上部が軸受け上部より1.0mm 以上沈んだ状態で使用されている場合とする。  	Rotational torque shall be 120% or less before nut is tightened. The difference between maximum and minimum value in the same direction. shall be 5 mN·m{51 gf·cm} or less. Without rotational deviation. 回転トルクはナット締付け前の120%以下。また同一方向で最大と最小の差は 7 mN·m 以内とし，回転ムラを生じないこと。

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初設	94-6-7	佐藤	川崎	神崎

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APPD.	CHKD.	DSGD.
1技-2G '00.7.06 相沢	1技-2G '00.7.06 佐々木(和)	1技-2G '00.7.-6 鈴木

TITLE ROTATIONAL POTENTIOMETER
回転形可変抵抗器

DOCUMENT NO. 4K5021-2 (3/12)

DSG1, 8502781 Y. KANZAKI
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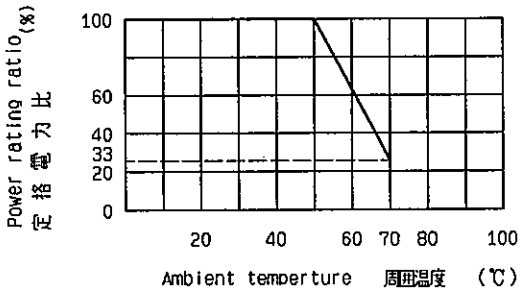
3.2 Electrical characteristics 電気的性能

	Item 項目	Conditions 条件	Specifications 規格
1	Nominal total resistance and tolerance 公称全抵抗値 および許容差	The resistances between terminals 1and 3 shall be measured 端子1，3間の抵抗値を測定する。	10K Ω±20%
2	Resistance law 抵抗変化特性	Measurement shall be made by the resistance law method: For other procedures, refer to IEC Pub. 393-1. 電圧法にて測定。その他 JIS C 5261 に準拠する。	Taper カーブ 15A Refer to the attached 別紙参照
3	Power rating 定格電力	Power rating is based on continuous 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と3の間に連続負荷することが出来る最大電力。 周囲温度に対する，電力軽減曲線は下図とする。 	0.1 W
4	Rated voltage 定格電圧	Rated voltage 定格電圧 $E=\sqrt{PR}$ Maximum operating voltage 最高使用電圧 Where ただし P: Power rating 定格電力 (W) R: Nominal total resistance 公称全抵抗値 (Ω) When the rated voltage exceeds the maximum operating voltage, the maximum operating voltage shall be the rated voltage(For a.c. only) ただし，定格電圧が最高使用電圧を超える場合は，この最高使用電圧を定格電圧とする。（交流専用）	150 V a.c.
5	Resistance-temperature characteristic 抵抗温度特性	The potentiometer shall be maintainedin a thermostatic chamber at a temperature of 70±3 ℃ without electrical load for 5h. after which the total resistance shall be measured immediately. 温度 70±3℃の恒温槽中に無負荷で5時間放置後，ただちにそのままの状態で，全抵抗値を測定する。	Change in total resistance is relative to the value before test 全抵抗値の変化は 初期値に対して +5 −20 %

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TITLE ROTATIONAL POTENTIOMETER 回転形可変抵抗器

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	Item 項目	Conditions 条　件		Specifications 規　格
6	Attenuation and insertion loss 最大減衰量と 挿入損失	The attenuation and insertion loss at each end of Angle of effective rotation shall be measured. And the attenation and insertion loss shall be induced from the first unite. when the A.C. 10V is applied between terminals 1 and 3 and the second unite by frequency of 10KHz 摺動子を有効回転角度の各終端に置いた時の最大減衰量，挿入損失を測定する。 測定はA. C. 10V 1KHzを端子1－3間に印加し、端子①－2間の出力電圧を測定し電圧の比で表す.		Total resistance 全抵抗値 / Attenuation 最大減衰量 less than 10kΩ未満 / or ~~less~~ more -110dB以下 or more 10kΩ以上 / or ~~less~~ more -120dB以下 Total resistance 全抵抗値 / Insertion loss 挿入損失 less than 10kΩ未満 / or less -2dB以下 or more 10kΩ以上 / or less -1dB以下
7	Jump-off resistance 跳　躍	When the moving contact passes from the silver area to the resistance area, the magnitude of change caused by this sudden change in voltage shall be measured. 銀面より抵抗面に入る時の急激な電圧の変化を測定する。 Taper カーブ / Between terminals 端子間 10A, 15A, 3B / 1-2 However, other taper shall not be specified. ただし、その他のカーブは規定しない。		0.01% or less of the nominal voltage. 印加電圧の 0.01%以下。
8	Sudden change in voltage 逆　行	5 V d.c. shall be applied to the terminals between 1 and 3 and the following jump-off voltage shall be measured. 端子1－3間にd. c. 5V印加し，逆行電圧を測定する。 Taper カーブ / Between terminals 端子間 10A, 15A, 3B / 1-2 However, other taper shall not be specified. ただし、その他のカーブは規定しない。		0.01% or less of the nominal voltage. 印加電圧の 0.01%以下。
9	Noise 摺動雑音	20 V d.c., when the rated voltage is 20 V or less, its rated voltage shall be applied to the terminals between 1 and 3. And then the noise shall be measured by the specified speed. 端子1－3間に直流電圧20V（定格が20V以下の時は，その電圧）を加え このときに発生する雑音電圧を測定する。 Shaft rotation 軸回転 / rotations/min 30回/分 For other procedures, refer to IEC Pub. 393-1-6, Test Method A. その他 JIS C 5261 A 法による。		Less than 20 mV p-p 未満
10	Insulation resistance 絶縁抵抗	A voltage of 500 V d.c. shall be applied 1 min after which measurement shall be made. d. c. 500V, 1分後	Between individual terminals and frame/shaft 端子ーケース・軸間	100 MΩ or more 以上
11	Dielectric strength 耐電圧	Trip current 感度電流 : 1 mA Measuring frequency 50/60Hz 500V 周波数 for 1 min 50/60 Hz 500V a. c. 1分間	Between individual terminals and frame/shaft 端子ーケース・軸間	Without damage toparts, arcing or breakdown etc. 損傷，アーク，絶縁破壊等がないこと。

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2	2007-07-11	池之上		玉腰
転図	94-6-3	佐藤	川崎	神崎

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APPD.	CHKD.	DSGD.
1一設2 '94.8.30 川崎		1一設2 '94.8.30 神崎

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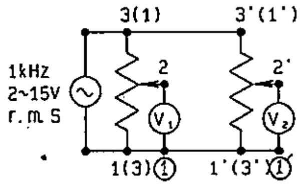
	Item 項目	Conditions 条件	Specifications 規格
12	Tracking error ~~連動誤差~~△相互偏差	The voltage of 2 V r.m.s. shall be applied between terminal 1 and 3 and between terminals 1'to 3'by measuring frequency at 1 kHz. The output voltage shall be measured between terminals 1 and 2 and between terminals 1'and 2'(for the 15 C and 25 C taper, the measurement shall be made between terminals 2 and 3 and between terminals 2' and 3') units the first of these shall be the standard one. If there is not any doubt about the results, d.c. voltage shall be used as the test voltage. 端子1−3間，端子1'−3'間にそれぞれ1kHZで2~15V（正弦波実効値）の電圧を加え，前段を基準として端子①−2間，端子①'−2'間（15C，25Cカーブの場合は，2−3間，2'−3'間）の出力電圧を測定する。なお，判定に疑義が生じなければ，試験電圧として直流を用いてもよい。 Input impedance of the voltmeter 電圧計の入力インピーダンス : 10MΩ or more 以上 	
		Total resistance 全抵抗値: △ less than 10kΩ 未満	~~△=80dB~~ −60dB ~ 0dBにて within ± 3 dB以内
		Total resistance 全抵抗値: or more 10kΩ以上 △2 ~~less than 250kΩ未満~~ or less 250KΩ以下	−100dB ~ 0dB within ± 3 dB以内
13	Electrostatic noise 静電ノイズ	The moving shaft shall be rotated at the specified speed. And the electrostatic noise shall be induced between terminals 1 and 2 or between terminals 2 and 3. 軸を指定の速さで回転させながら1−2端子間，2−3端子間にて測定する。 Rotational potentiometer 回転形: s 60°/秒	Without noise 発生しないこと。
14	Tap タップ	The resistance and the tolerance between nominal taps (Between taps 1 and 4.) 公称タップ間（1−4間）抵抗値および許容差は	Ω ± 30%
		The end resistance between intermediate taps (Between taps 2 and 4) 中間タップ（2−4間）残留抵抗値は	1% or less of the nominal resistance. (Max. 500 Ω or less) 公称全抵抗値の1%以下（最大500Ω以下とする）
		Tap position and tolerance タップ位置および許容差	± 3°

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△2	'07-7-11	池之上		玉田
△1	'95-6-8	川崎	神崎	鈴木
△1	'94-9-28	川崎		神崎

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3.3 Endurance characteristics 耐久性能

	Item 項目	Conditions 条件	Specifications 規格
1	Solderability はんだ付け性	The terminals shall be stored at a temperature of 100°C with relative humidity of 100% for 16h. after which mesurement to "Menisuco graph solderability" 温度100°C, 湿度100%RHに16時間放置後, メニスコグラフ(230°C非活性ロジン)にて判定する.	(1) Solder wetting time shall be 3 s or less. はんだ濡れ時間 3.0秒以内 (2) A new uniform coating of solder shall cover a minimum of 95% of the surface being immersed. はんだ浸漬面積の95%以上新しいはんだで濡れていること.
2	Resistance to soldering heat はんだ耐熱性	For procedures other than those specified below, refer to IEC Pub. 68-2-20. Test Tb Method 1A or 2. 下記のほかは JIS C 0050 (ただし試験方法は1Aまたは2による)に準拠する. Solder bath method ディップの場合 Bit temperature 温度 : 260±5°C Immersion time 時間 : 5±1秒 Pre heat temperature and immersion time 温度 : 120±10°C, 時間 : 2分 This procedure constitutes 1 cycle and testing 2cycle 以上を2回繰り返す. Thickness of heat shunt (Printed wiring board) 熱遮蔽板(プリント基板)の厚さ : 1.6 mm Material 材質 Single sided copper clad laminate 片面銅張積層板 Dimensions of component holes in the heat shunt (Printed wiring board) shall be in accordance with those specified in this specification. 端子穴はゲージ寸法による. Soldering iron method 手はんだの場合 Bit temperature 温度 : 350±10 ℃ Application time of soldering iron 時間 : 5 +1 0 S 秒 Extensive pressure must not be applied to the terminal 但し 端子に異常加圧のないこと.	Change in total resistance is relative to the value before test 全抵抗値の変化は初期値の ±5% Electrical characteristics shall be satisfied. Without distinct deformation in appearance. 電気的性能を満足すること. 外観に著しい変化がないこと.
3	Resistance to flux penetration 耐フラックス上がり	For test method, refer to page. "Test Method for Resistance to Flux Penetration." 試験方法は別紙の「耐フラックス上がり試験方法」による. Nominal board thickness 基板の厚さ : 1.6 mm	Electrical characteristics and characteristics shall be satisfied. 電気的性能, 機械的性能を満足すること.
4	Dry heat 耐熱性	The potentiometer shall be stored at a temperature 70±2°C for 240±8h in a thermostatic chamber. Then the potentiometer shall be maintained at standard atmospheric conditions for 1h. after which measurements shall be made. For other procedures, refer to IEC Pub. 68-2-2. Test Bb. (Forced air circulation may be used.) 温度70±2℃の恒温槽中にて240±8時間放置し, 常温常湿中に1時間放置後測定する. その他 JIS C 0021 に準拠する.	Change in total resistance is relative to the value before test 全抵抗値の変化は初期値の +5 −20 %

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	Item 項目	Conditions 条　　件	Specifications 規　　格
5	Cold 耐寒性	The potentiometer shall be stored at a temperature of -20±3 ℃ for 240±4 h in a thermostatic chamber. Then the potentiometers hall be taken out of the chamber and its surface moisture shall be removed. And then the potentiometer shall be subjected to standard atmospheric conditions for 1 h. after which measurement shall be made. For other procedures. refer to IEC Pub. 68-2-1. Test Ab. (Forced air circulation may be used.) 温度-20±3℃の恒温槽中に240±4時間放置後とり出し，表面の水分をふきとり常温常湿中に1時間放置後測定する。 その他 JIS C 0020 に準拠する。	Change in total resistance is relative to the value before test 全抵抗値の変化は 初期値の　　±20% There shall be no daformation or cracks of molded part. 成形部分に変形，クラックがないこと。
6	Damp heat 耐湿性	The potentiometer shall be stored at a temperature of 60±2 ℃ with relative humidity of 90% to 95% for 240±4 h in a thermostatic chamber. Then the potentiometer shall be taken out of the chamber and its surface moisture shall be removed. And then the potentiometer shall be subjected to standard atmospheric conditions for 1 h. after which measurement shall be made. For other procedures. refer to IEC Pub. 68-2-3. 温度60±2℃，湿度90~95%の恒温恒湿槽中に240±4時間放置した後とり出し，表面の水分をふきとり常温常湿中に1時間放置後測定する。 その他 JIS C 0022 に準拠する。	Change in total resistance is relative to the value before test 全抵抗値の変化は 初期値の　　+25 / -5 % Insulation resistance　20 MΩ or more 絶縁抵抗　　以上 Noise　Less than 雑動雑音　100 mVp-p 未満
7	Change of temperature 温度サイクル	The potentiometer shall be subjected to 5 successive change of temperature cycles, each as shown in table below . Then is surface moisture shall be removed. And then the potentiometer shall be subjected to standard atmospheric conditions for 1 h after which measurements shall be made. 下表に示した温度サイクルを連続5回行なう。 表面の水分をふきとり常温常湿中に1時間放置後測定する。	Change in total resistance is relative to the value before test 全抵抗値の変化は 初期値の　　±20%

	Temperature 温　　度	Duration 放置時間
1	-10±3 ℃	30 min 分
2	Stnadard atmospheric conditions 常　　温	10 to 15 min 分
3	70±2 ℃	30 min 分
4	Stnadard atmospheric conditions 常　　温	10 to 15 min 分

For other procedures. refer to IEC Pub. 68-2-14.
その他 JIS C0025に準拠する。

Insulation resistance 絶縁抵抗	Clause 3.2.10 shall be satisfied. 3.2.10項を満足すること。
Dielectric strength 耐電圧	Clause 3.2.11 shall be satisfied. 3.2.11項を満足すること。
Appearance 外　　観	There shall be no daformation or cracks of molded part. 成形部分に変形，クラックがないこと。

SYMB	DATE	APPD	CHKD	DSGD

ALPS ELECTRIC CO., LTD.

APPD.	CHKD	DSGD.
1一設2課 '94.6.7 佐藤	1一設2 '94.6.06 川崎	1一設2 '94.6.03 神崎

TITLE ROTATIONAL POTENTIOMETER
回転形可変抵抗器

DOCUMENT NO 4K5021-2 (8/12)

DSG1, 8502781 y. kanzaki
94.04.25 R

	Item 項目	Conditions 条　　件	Specifications 規　　格
8	Vibration 耐振性	The moving contact shall be placed about half way (50%) in the angle of effective variable range. Only endurance conditioning by a frequency sweep shall be made. The entire frequency range, from 10 Hz to 55 Hz and return to 10 Hz, shall be transversed in 1 min. Amplitude (total excursion) : 1.5 mm This motion shall be applied for a period of 2 h in each of 3 mutusily perpendicular axes (a total of 6 h). For other procedures, refer to IEC Pub. 68-2-6. 有効可変範囲のほぼ50%の位置に摺動子を置き，掃引の割合10~55~10 Hz/分，全振幅1．5mm，X・Y・Z方向に各2時間． その他 JIS C 0040 に準拠する．	Without intermittent contacts or open circuiting between terminals. 各端子間で断続がないこと． Rotational torque, and end stop shall not deviate from the previously specified value. 回転トルク，ストッパ強度は初期規格値を満足すること．
9	Shock 耐衝撃性	Peak acceleration 加速度 : 981 m/s²{100 G} Duration of the pulse 作用時間 : 6 ms Three successive shocks shall be applied in both directions of 3 mutually perpendicular axes (a total of 18 shocks). For other procedures, refe to IEC Pub. 68-2-27. 6面X3回(計18回) その他 JIS C 0041 に準拠する．	Without deformation of case or excessive looseness of teminals. 外観の変形および端子などの著しいガタがないこと．
10	Resistance to sulfuration 耐硫化性	The potentionmeter shall be stored at a H_2S density : 1ppm, tempreture : 40°C, relative humidity : 70% at 75%, for 96h in thermostatic chamber, after which measurments shall be made. H_2S 濃度1ppm，温度40°C 70~75%RHの槽内に96H放置後測定する．	Noise shall be relative to three times less to the value befor test. The attennuation and insertion loss shall not deviate from the previously speciffied value. 摺動雑音，は初期規格値の3倍以下．また，最大減衰量，挿入損失は，初期規格値を満足すること．
11	Endurance 動作耐久性	The moving shaft, without electrical load, shall be rotated from end stop to the other and returned to its original position extended over 90% or more effective angle. This procedure constitutes 1 cycle. And the moving shaft shall be subjected to 600 cycles per hour, a total of 15000±200 cycles (5000 to 8000 continuous cycles for 24h) Measurements shall be made immediately after 5000 cycles, immediately after 10000 cycles. 無負荷で軸を600回/時(1往復1回とする)の速さで有効回転角度の90%以上にわたり1日連続5000~8000回，合計15000±200回 回転させる．ただし，試験中5000回および10000回においても測定する．	Change in total resistance is relative to the value before test. 全抵抗値の変化率は初期値に対し ±15% Noise Less than 摺動雑音 47 mVp-p 未満

SYMB	DATE	APPD	CHKD	DSGD

ALPS ELECTRIC CO., LTD.

APPD.	CHKD.	DSGD.	TITLE
1一設2課 '94.6.7 佐藤	1一設2 '94.6.06 川崎	1一設2 '94.6.03 神崎	ROTATIONAL POTENTIOMETER 回転形可変抵抗器

DOCUMENT NO 4K5021-2 (9/12)

DSG1, 8502781 y.kanzaki
94.04.25

4. NOTE
その他

4.1 The outside appearance
外観

1) The appearance is an easily changing color. Because this products case is made of the brass, that is an easily oxidizable metal.

本製品は外観部に黄銅材を使用しておりますので，酸化等により自然変色致します．

2) Without deformation distinct a flow, striked damage, change color, in appearance.

著しい傷，打痕，人為的変色等の無い事．

3) Pay attention shoud not catch up potentiometer in the naked fingers. It may cause a changing color apperance for sweat of fingers.

製品を素手で摑むと指の汗，水分等により変色する恐れがありますので，使用上ご注意下さい．

4) In operation, storage in high tempreture and humidity, and in corrosive gas, shall be avoided.

製品の保管は高温・高湿を場所，腐食性ｶﾞｽ中は外観が変色する恐れがありますので避けるようお願いします．

5) This product is made for a.c. use only. Please do not use d.c. voltage.

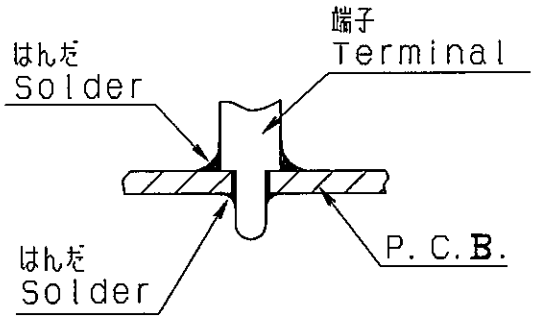
本部品はa. c. 専用ですのでd. c. での御使用はお避け下さい．

6) Caution for soldering

はんだ付け時のご注意事項

Please avoid soldering on upper surface of P.C.B. as shown.

図のようP. C. B. の上面にはんだをする配線はお避け下さい．



SYMB	DATE	APPD	CHKD	DSGD

ALPS ELECTRIC CO., LTD.

APPD.	CHKD.	DSGD.
一設2 '94.9.02 川崎		一設2 '94.9.01 神崎

TITLE ROTATIONAL POTENTIOMETER
回転形可変抵抗器

DOCUMENT NO. 4K5021-2 (10/12)

DSG1. 8502781 Y. KANZAKI
94.04.25

10R

TEST METHOD FOR RESISTANCE TO FLUX PENETRATION　耐フラックス上がり試験方法

1. Materials

(1) Solder
Refer to IEC Pub. 68-2-20. Appendix B.

(2) Flux
GX-7 ASAHI CHEMICAL RESEARCH LABORATORY, MH-820V TAMURA KAKEN CO., LTD or an equivalent flux shall be used.
The flux used shall consist 15% by weight of rosin.

1. 材　料

(1) はんだ
JIS Z 3282に規定の63%Snはんだ（H63A）もしくは60% Snはんだ（H60A）

(2) フラックス
アサヒ化研製 GX-7，タムラ化研製 MH-820V もしくはそれと同等品で，固形分濃度は重量比15%

Flux フラックス		Specific gravity 比　重　(20 ℃)
ASAHI CHEMICAL RESEARCH LABORATORY アサヒ化研製	GX-7	0.823
TAMURA KAKEN CO., LTD タムラ化研製	MH-820V	0.824

(3) Printed wiring board
A board specified by NEMA(XPC) or it's equivalent board. Board shall be single-sided and its nominal thickness shall be specified in Clause "Resistance to flux penetration" with a copper foil thickness of 35 μm. The position of mounting holes for test component shall correspond exactly to the terminal configuration so that terminals fit exactly into the holes. Hole size shall be as specified. If not specified, hole size shall exceed the diameter (or exterior dimensions in the case of non-circular terminals) of terminals by 0.2 mm to 0.4 mm. Unless otherwise specified, the conductor land size shall exceed the diameter (or dimensions) of holes by 2 mm to 4 mm.

(3) 基　板
JIS C 6485で規定されたプリント基板（P.P)もしくはこれと同等品（厚さは，「耐フラックス上がり」の条件に規定のもの35μm 片面銅箔）に，部品のリード位置に対応して，特に指定のない場合は（リード形状+0.2 ～0.4)mmの穴をあけたもの。（取付穴寸法指定がある場合はそれによる。）パターンランドは特に指定がない場合は，ϕ（リード外径＋2～4）mmとする。

2. Test

(1) The printed wiring board specified in Clause 1 shall be soaked only soldering side in the flux specified in Clause 1 for 3 to 5 s. The board shall then be taken out of the flux.

(2) The test components, its electrical characteristics and mechanical characteristics specified in this specification having already been measured, shall be inserted completely into the board as soon as the board is removed from the flux.

(3) Either the flux bath method or the foaming method shall be used to apply flux a second time to the board. In either case, flux shall not come into contact with the component side surface and fluxing time shall be 3 to 4 s.
Note: After fluxing, if preheating is necessary before mounting, then the surface of the solder side shall be heated to 75 ℃ to 90 ℃ for 1 min or less.

(4) Using an automatic soldering system or a hand dipping system, the board shall be soldered up to the component side surface (but the solder shall not come into contact with the component side) for 5±1 s at 250 ℃ to 260 ℃.

(5) The board shall be subjected to standard atmospheric conditions for 24 h or more after the soldering. Tests shall then be carried out as specified below;
① Visual inspection of appearance
② Measurement of characteristics as specified

2. 試　験

(1) 1項指定の基板を1項指定のフラックス液中に基板の片面を全面3～5秒間浸漬し，取り出す。

(2) 性能の初期測定を終了した部品をすみやかに，かつ，浮きがないようにマウントする。

(3) マウントした基板に，まず，基板上面スレスレまで指定のフラックスを塗布する。（フラックス塗布は，発泡式または静止液中浸漬により3～4秒間行なう。）

注：フラックス塗布後，プレヒートを行なう場合は，プレヒート時間は1分以内で基板のはんだ付面側の表面温度が75～90℃になるようにする。

(4) その後自動はんだ付装置もしくは手ジャブにより，250～260℃のはんだ浴中で5±1秒間浸漬しはんだ付けする。この時の浸漬深さは基板上面スレスレに達するように行なう。

(5) はんだ付けが終ったのち室温に24時間以上放置し，その後，下記項目を調べる。
① 目視による外観
② 規格に規定の性能の測定

SYMB.	DATE	APPD.	CHKD.	DSGD.
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APPD.	CHKD.	DSGD.	TITLE
1一設2課 '94.6.17 佐藤		1一設2 '94.6.17 神崎	POTENTIOMETER 可変抵抗器

DOCUMENT NO. 4K5021-2 (11/12)

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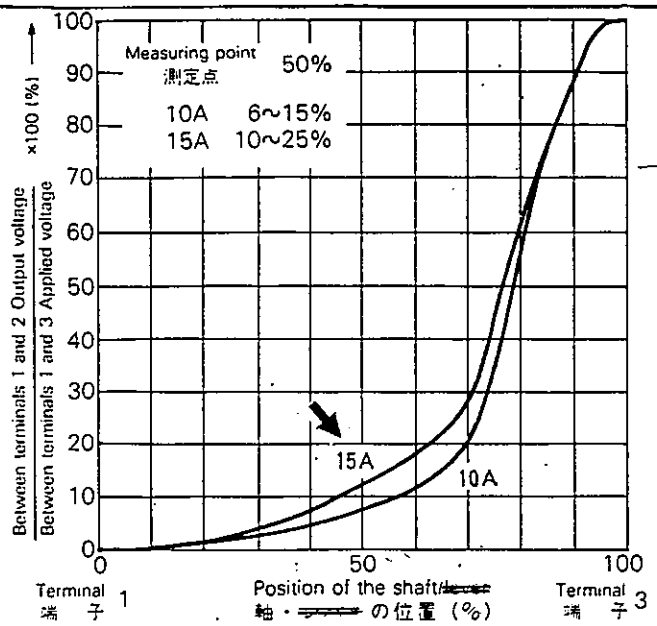

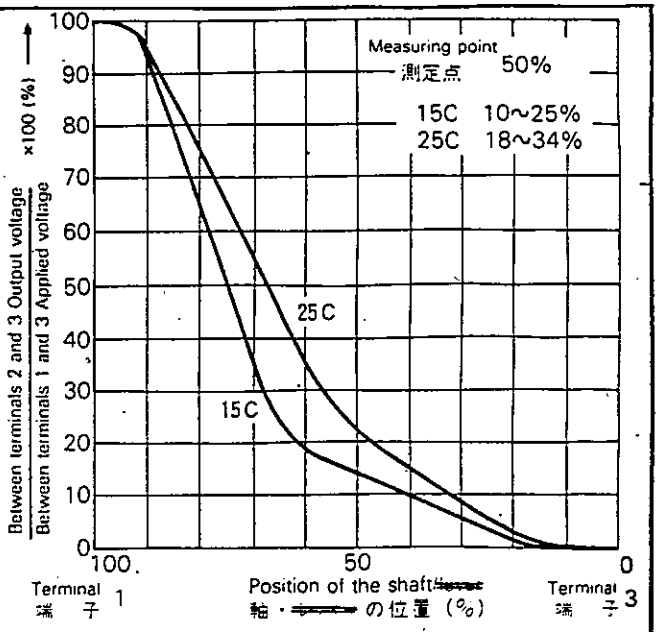

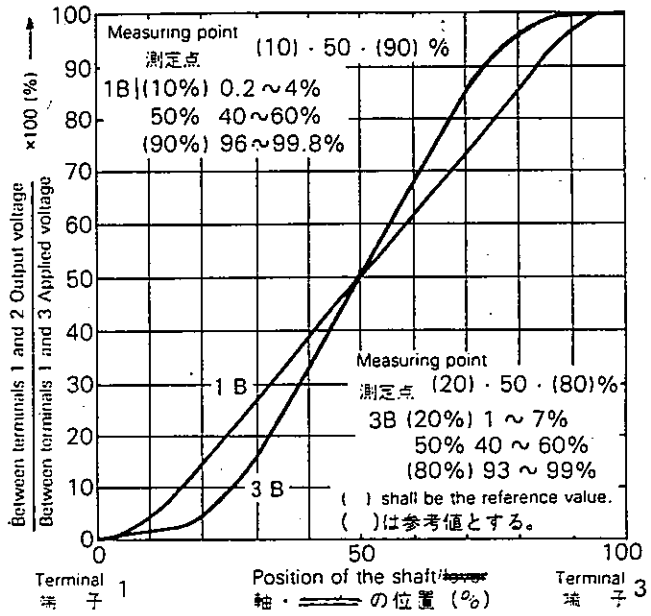

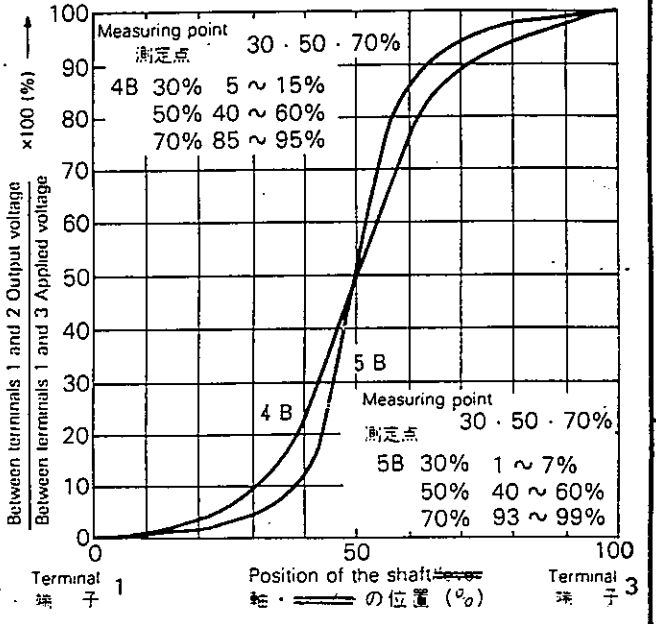

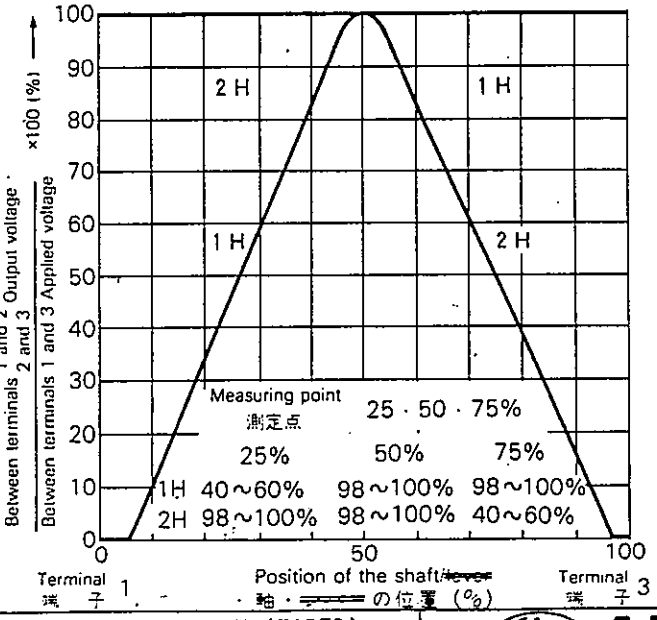

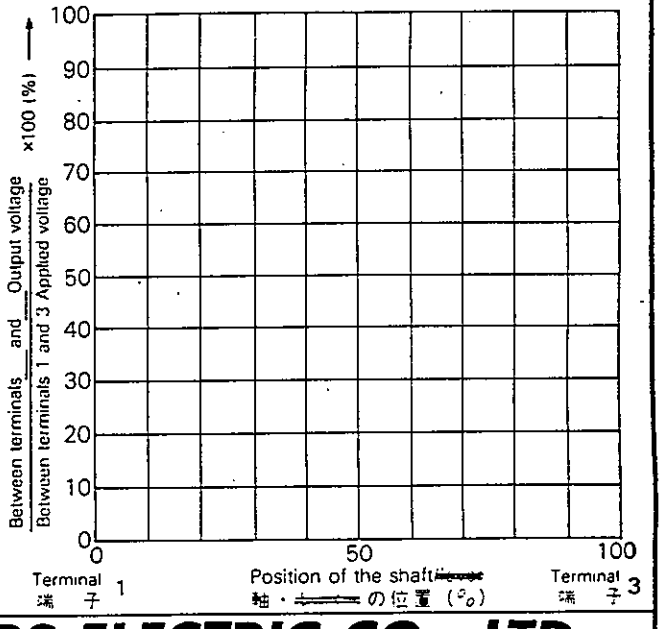

RESISTANCE LAW (TAPER)
抵抗変化特性規格

ALPS ELECTRIC CO., LTD.

SYMB.	DATE	APPD.	CHKD.	DSGD.
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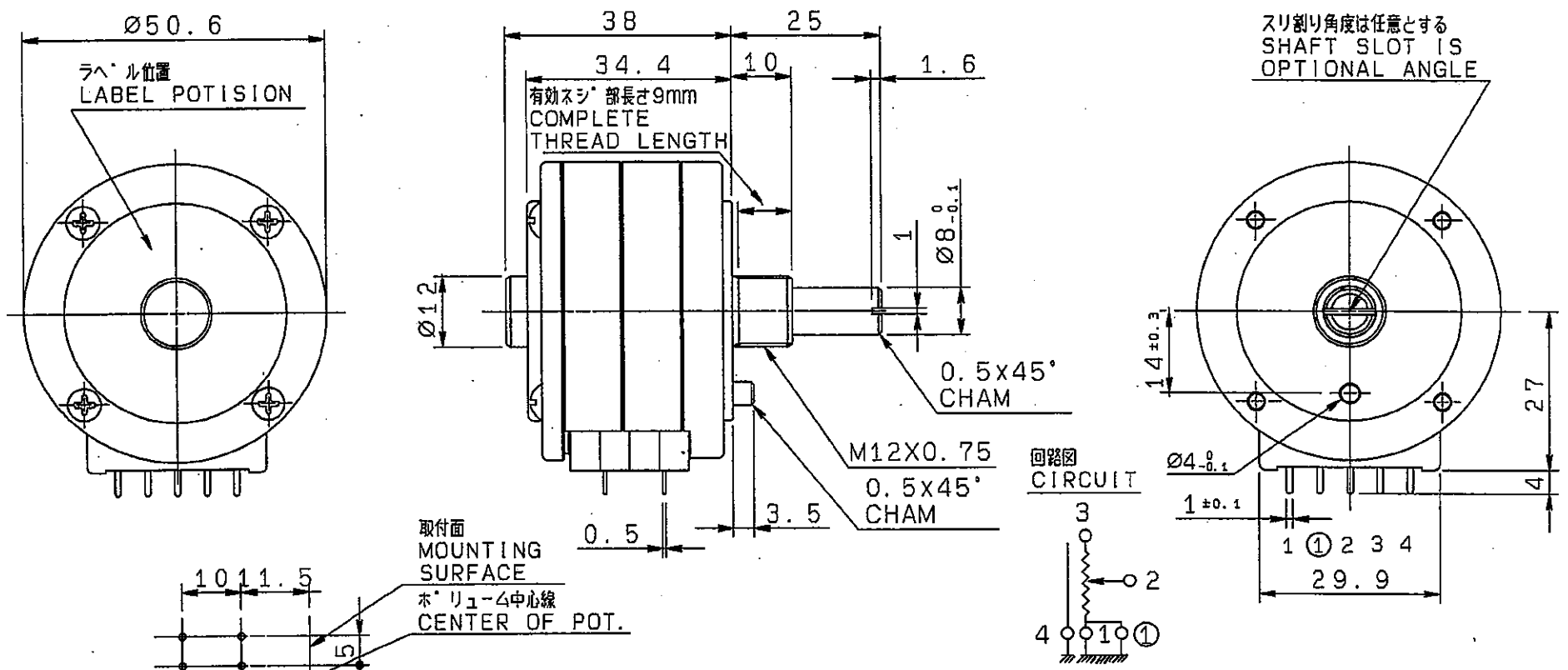
APPD.	CHKD.	DSGD.
4.4.27 梅森	'94.4.27 酒井	'94.4.26 神崎

TITLE: POTENTIOMETER 可変抵抗器

DOCUMENT NO. 4K5021-2 (12/12)



取付穴寸法図 許容差±0.1 挿入側からみた図
P.W.B. MOUNTING DETAIL
TOLERANCE±0.1
VIEWED FROM MOUNTING SIDE

指定なき部分の許容差 TOLERANCES UNLESS OTHERWISE SPEC	
L≦10	±0.3
10＜L＜100	±0.5
100≦L	±0.8
角度 ANGULAR DIMENSION	±5°

PART NO.	NAME	MATERIAL NAME / CODE	FINISH
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FORM REV	94.2-4	相沢	佐藤	大矢
SYMB	DATE	APPD	CHKD	DSGD

ALPS ELECTRIC CO., LTD.

DSGD. セツケイ1-850278 Y. KANZAKI 93-10-19	SCALE 1:1		
CHKD. T. MIYAKE 93-10-20		TITLE 組立図	
APPD. T. AZEMA 93-10-20	UNIT m.m	DOCUMENT NO. K50210001	93.12.21