

Customer:

No. SS-2010-7626

Date: Mar. 29, 2010

Attention:

Your ref. No.:

Your Part No.: RSA0K12A

SPECIFICATIONS

ALPS';

MODEL: RSA0K12A9

(10k X2)

Spec. No.:

Sample No.: F 9 7 4 2 9 0 1 M

RECEIPT STATUS

RECEIVED

By Date

Signature

Name

Title

ALPS
ALPS ELECTRIC CO., LTD.

DSG'D

APP'D

ENG. DEPT.

Sales

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B6523

Q1003#03A (EA)

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

1. THIS SPECIFICATIONS APPLY TO RSAOK12A9 POTENTIOMETER.

2. CONTENTS OF THIS SPECIFICATIONS.

5SAO2M0033

4S0001-200, 4S0001-203

SAO2MA111

3. MARKING

- MARKING ON ALL UNITS
DATE CODE, RESIST. VALUE

• CAUTION

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.

CLASS No.	TITLE MASTER TYPE POTENTIOMETER(SLIDE)
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1. Environment 一般事項

- 1.1 Operating temperature range 使用温度範囲 : -10~60°C
 1.2 Storage temperature range 保存温度範囲 : -30~70°C
 1.3 Test conditions 試験条件

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

- Ambient temperature : 5°C to 35°C
 Relative humidity : 45% 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±2°C
 Relative humidity : 60% to 70%
 Air pressure : 86kpa to 106kpa.

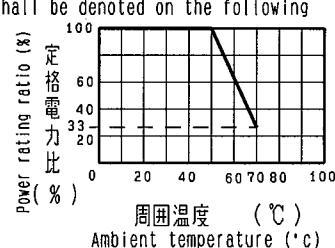
試験及び測定は特に規定がない限り温度5~35℃, 相対湿度45~85%, 気圧86~106kpaの標準状態のもとで行う。
 ただし、判定に疑義を生じた場合は温度20±2℃, 相対湿度60~70%, 気圧86~106kpaにて行う。

2. Appearance 外觀

The potentiometer shall be well done and not have any excessive rust, crack, split, poor plating and discolor in any portion.

各部の仕上げは良好で機能上有害なサビ、キズ、フレ、メッキ不良及び剥離などがあってはならない。

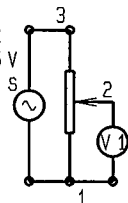
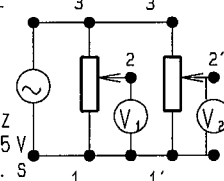
3. Electrical characteristics 電気的性能

Item 項目	Conditions 条件	Specifications 規格
3.1 Nominal total resistance and tolerance 公称全抵抗値および許容差	Measurement shall be made by the resistance between terminal 1 and 3 with lever set at terminal 1 or 3. レバーを端子1又は、3の終端におき、抵抗器の端子1-3間の抵抗値を測定する。	10kΩ±20%
3.2 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、電力軽減曲線は右図とする。 	0.25W
3.3 Rated voltage 定格電圧	Rated voltage 定格電圧 $E = \sqrt{PR}$ (V) 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. 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。	Maximum operating voltage 最高使用電圧 D. C. 20V A. C. 350V
3.4 Resistance law (Taper) 抵抗変化特性	Measurement shall be made by the resistance law method. 電圧法にて測定する。 Measurement shall be made at the position of right diagram from the edge at the side of terminal 1. When based on terminal 3, from the edge at the side of terminal 3. $20 \log \frac{\text{output voltage between terminals 1 and 2}}{\text{Applied voltage between terminals 1 and 3}}$ (dB) $20 \log \frac{1-2 \text{ 端子間出力電圧}}{1-3 \text{ 端子間印加電圧}}$ (dB)	TAPERED CURVE "SPECIAL" (SPS99)

ALPS ELECTRIC CO., LTD.

SYMB	DATE	APPD	CHKD	DSGD	APPD. M-2 藤 (G) 10-02-23 加藤	CHKD. M-2 鈴 10-02-22 鈴木	DSGD. M-2 清 10-02-22 清水	TITLE SPECIFICATIONS DOCUMENT NO. 5SA02M0033	(1/5)
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CLASS No.	TITLE MASTER TYPE POTENTIOMETER(SLIDE)
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Item 項目	Conditions 条件	Specifications 規格
3.5 Attenuation and insertion loss 最大減衰量と挿入損失	<p>The attenuation and insertion loss at each end of lever travel shall be measured. しゅう動子を移動距離の各終端に置いたとき 最大減衰量、挿入損失を測定する。</p> <p>The voltage of 2V r.m.s. to 15V r.m.s shall be applied between terminal 1 and 3 by measuring frequency at 1kHz. The output voltage shall be measured between terminals 1 and 2 and between terminals 2 and 3. If there is not any doubt about the results, D.C. voltage shall be used as the test voltage. 端子1-3間に1kHzで2~15V 1kHz (正弦波実効値)の電圧を加え、端子1-2間、端子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良い。</p>  <p>Input impedance of the voltmeter : 10MΩ or more. 電圧計の入力インピーダンスは10MΩ以上</p>	<p>Attenuation 100dB or more 最大減衰量 100dB 以上</p> <p>Insertion loss within 0.1dB 以内 挿入損失</p>
3.6 Noise しゅう動雑音	<p>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. For other procedures, refer to IEC 393-1-4.15 . Traveling speed:20 mm/sec. 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、レバーを20mm/秒の速さで移動させ、このときに発生する雑音電圧を測定する。その他 JIS C 5261 A 法による。</p>	<p>Less than 47 mV p-p 未満 Exclude the pop-noise in the travel area 5mm from the end of the term.1.This condition shall also apply to the products after the durability test 端子1側末端より5mm以内の本'ツノイス'は無視。耐久性能試験後も含む。</p>
3.7 Insulation resistance 絶縁抵抗	<p>A voltage of 250 V d.c. shall be applied for 1 min., after which measurement shall be made. D. C. 250Vの電圧を1分間印加して測定。</p>	<p>Between individual terminals and frame/lever Between adjacent terminals 100 MΩ or more. 端子-レバー間、端子-枠間 独立した抵抗素子の端子間 100 MΩ 以上</p>
3.8 Dielectric strength 耐電圧	<p>Trip current : 2 mA Measuring frequency : 50/60 Hz 250 V a.c. r.m.s. for 1 min. A. C. 250V r.m.s. 1分間。 感度電流 : 2 mA (周波数 : 50/60 Hz)</p>	<p>Between individual terminals and frame/lever Between adjacent terminals without damage to parts, arcing or breakdown etc. 端子-レバー間、端子-枠間 独立した抵抗素子の端子間 損傷、アークおよび絶縁破壊を生じないこと。</p>
3.9 Tracking error 相互偏差	<p>The voltage of 2 to 15V r.m.s. shall be applied between terminals 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 terminal 1' and 2' 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。</p>  <p>Input impedance of the voltmeter : 10MΩ or more. 電圧計の入力インピーダンスは10MΩ以上</p>	<p>3 dB max. between -40 dB to 0 dB</p>

ALPS ELECTRIC CO., LTD.

APPD.	CHKD.	DSGD.	TITLE
M-2技(G)	M-2技	M-2技	SPECIFICATIONS
10-02-23	10-02-22	10-02-22	DOCUMENT NO.
加藤	鈴木	清水	5SA02M0033 (2/5)
SYMB	DATE	APPD	CHKD


5. Endurance 耐久性能

	Item 項目	Conditions 条件	Specifications 規格
5.1	Endurance without load 無負荷しゅう動寿命	The moving contact, without electrical load, shall be slid from one end stop to the other and returned to its original position extended over 90% or more effective distance. This procedure constitutes 1 cycle. And the moving contact shall be subjected to 600 cycles per hour, a total of 100,000±200 cycles (5000 to 8000 continuous cycles for 24 hours.) 無負荷にてレハ'-を600サイクル/時の速さで有効移動距離の90%以上にわたり、一日連続5000~8000サイクル、合計100,000±200サイクル移動させる。	Change in total resistance is relative to the value before test: ±15% Noise: less than 150mvp-p Operating force: 0.1~0.8N Clause(3), (4) shall be satisfied. 全抵抗値の変化は、初期値の±15%以内しゅう動雑音は、150mVP-P未滿作動力は、0.1~0.8N その他は、(3項)(4項)を満足すること。
5.2	Cold 耐寒性	The potentiometer shall be stored at a temperature of -30±2°C for 96 hours 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 hour, after which measurement shall be made. -30±2°Cの恒温槽中にて96時間放置し、常温常湿中にて1時間放置後1時間以内に測定する。 但し水滴は、取り除くものとする。	Change in total resistance is relative to the value before test: ±20% Clause(3), (4) shall be satisfied. 全抵抗値の変化は、初期値の±20%以内 その他は、(3項)(4項)を満足すること。
5.3	Dry heat 耐熱性	The potentiometer shall be stored at a temperature of 70±2°C for 240±8 hours in a thermostatic chamber. Then the potentiometer shall be maintained at standard atmospheric conditions for 1 hour, after which measurements shall be made. 70±2°Cの恒温槽中にて240±8時間放置し、常温常湿中にて1時間放置後1時間以内に測定する。	Change in total resistance is relative to the value before test: +5/-30% Noise: less than 150mvp-p Operating force: 0.1~0.8N Clause(3), (4) shall be satisfied. 全抵抗値の変化は、初期値の+5~-30%以内しゅう動雑音は、150mVP-P未滿作動力は、0.1~0.8N その他は、(3項)(4項)を満足すること。
5.4	Damp heat 耐湿性	The potentiometer shall be stored at a temperature of 40±2°C with relative humidity of 90% to 95% for 96±4 hours in a thermostatic chamber. And its surface moisture shall be removed. And then the potentiometer shall be subjected to standard atmospheric conditions for 1 hour, after which measurement shall be made. 40±2°C相対湿度90~95%の恒温恒湿槽中にて96±4時間放置し、常温常湿中にて1時間放置後1時間以内に測定する。 但し水滴は、取り除くものとする。	Change in total resistance is relative to the value before test: +35/-5% Noise: less than 150mvp-p Operating force: 0.1~0.8N Clause(3), (4) shall be satisfied. 全抵抗値の変化は、初期値の+35~-5%以内しゅう動雑音は、150mVP-P未滿作動力は、0.1~0.8N その他は、(3項)(4項)を満足すること。

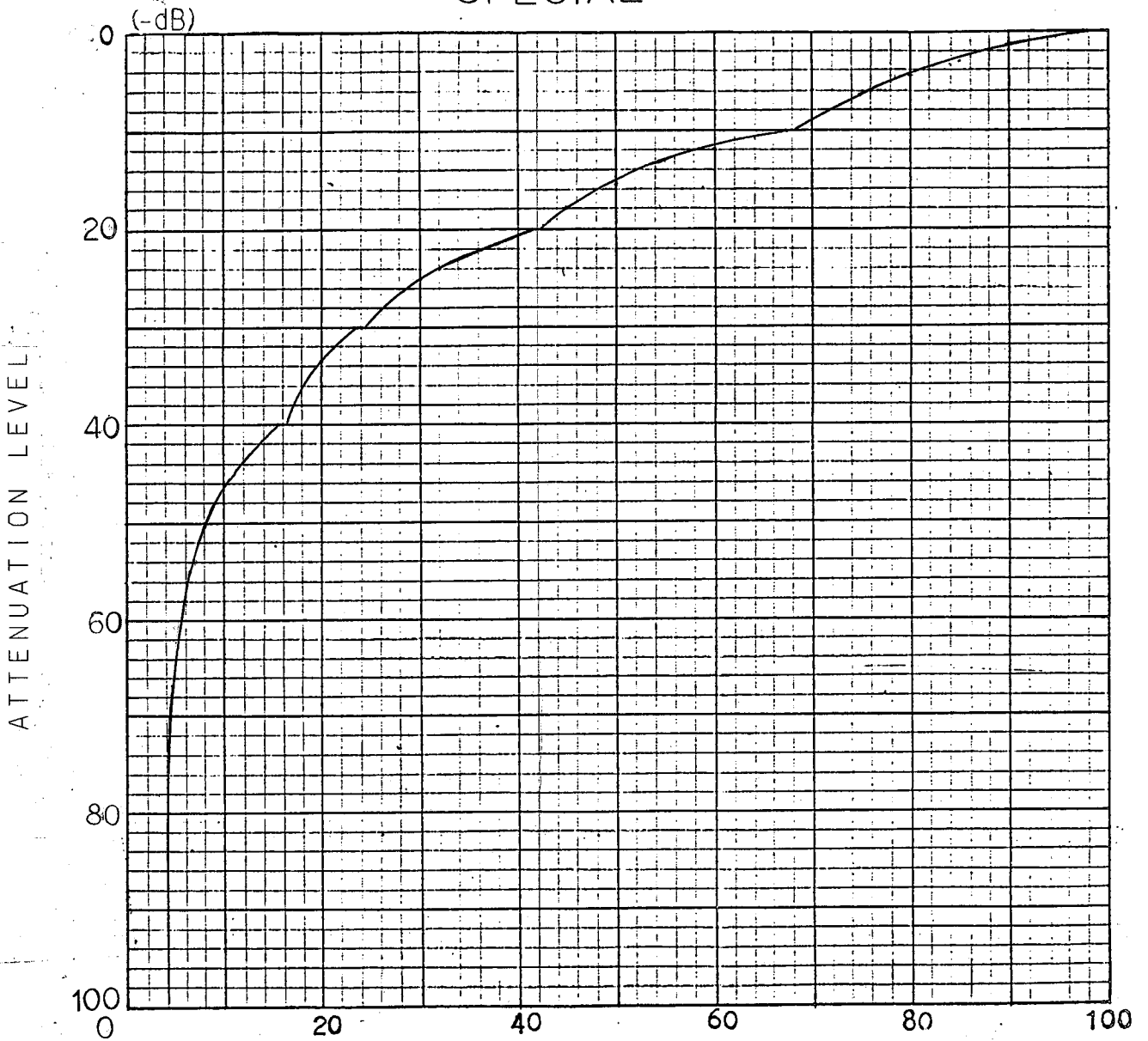
					ALPS ELECTRIC CO., LTD.					
					APPD.	CHKD.	DSGD.	TITLE		
					M-2枚(G) 10-02-23 加藤	M-2枚 10-02-22 鈴木	M-2枚 10-02-22 清水	SPECIFICATIONS		
								DOCUMENT NO.		
								5SA02M0033 (4/5)		
SYMB	DATE	APPD	CHKD	DSGD						

Item 項目	Conditions 条件	Specifications 規格															
5.5 Change of temperature 温度サイクル	<p>The potentiometer shall be subjected to 5 successive change of temperature cycles, each as shown in table below. Then its surface moisture shall be removed. And then the potentiometer shall be subjected to standard atmospheric conditions for 1 hour, after which measurements shall be made.</p> <p>下記条件で5サイクル試験後、常温常湿中に1時間放置後1時間以内に測定する。但し水滴は、取り除くものとする。</p> <table border="1" data-bbox="459 481 1102 779"> <thead> <tr> <th data-bbox="459 481 523 533">Step 段階</th> <th data-bbox="523 481 938 533">Temperature 温度</th> <th data-bbox="938 481 1102 533">Duration 時間</th> </tr> </thead> <tbody> <tr> <td data-bbox="459 533 523 593">1</td> <td data-bbox="523 533 938 593">-10±3°C</td> <td data-bbox="938 533 1102 593">30 min. 30分</td> </tr> <tr> <td data-bbox="459 593 523 654">2</td> <td data-bbox="523 593 938 654">Standard atmospheric conditions 常温</td> <td data-bbox="938 593 1102 654">10~15 min. 10~15分</td> </tr> <tr> <td data-bbox="459 654 523 714">3</td> <td data-bbox="523 654 938 714">70±2°C</td> <td data-bbox="938 654 1102 714">30 min. 30分</td> </tr> <tr> <td data-bbox="459 714 523 779">4</td> <td data-bbox="523 714 938 779">Standard atmospheric conditions 常温</td> <td data-bbox="938 714 1102 779">10~15 min. 10~15分</td> </tr> </tbody> </table>	Step 段階	Temperature 温度	Duration 時間	1	-10±3°C	30 min. 30分	2	Standard atmospheric conditions 常温	10~15 min. 10~15分	3	70±2°C	30 min. 30分	4	Standard atmospheric conditions 常温	10~15 min. 10~15分	<p>Change in total resistance is relative to the value before test:±20% Noise:less than 150mVp-p Operating force:0.1~0.8N Clause(3),(4)shall be satisfied.</p> <p>全抵抗値の変化は、初期値の±20%以内 しゅう動雑音は、150mVp-P未満 作動力は、0.1~0.8N その他は、(3項)(4項)を満足すること。</p>
Step 段階	Temperature 温度	Duration 時間															
1	-10±3°C	30 min. 30分															
2	Standard atmospheric conditions 常温	10~15 min. 10~15分															
3	70±2°C	30 min. 30分															
4	Standard atmospheric conditions 常温	10~15 min. 10~15分															

					ALPS ELECTRIC CO., LTD.			
					APPD.	CHKD.	DSGD.	TITLE
					M-2技(G)	M-2技	M-2技	SPECIFICATIONS
					10-02-23	10-02-22	10-02-22	DOCUMENT NO.
					加藤	鈴木	清水	5SA02M0033
SYMB	DATE	APPD	CHKD	DSGD				(5/5)

USED ON	100 mm TRAVEL TYPE	NAME	RESISTANCE TAPER
	ALPS ELECTRIC CO., LTD. 1-7 YUKIGAYA OTSUKA-CHO OTA-KU TOKYO JAPAN	TITLE	SPECIFICATIONS

TAPERED CURVE: SPECIAL



TERM. 1

PERCENT TRAVEL %

TERM. 3

NOTES: ATTENUATION

CHECK POINT	TOLERANCE
16 ± 0.5 mm TRAVEL FROM TERM. 1	40 ± 3 dB
24 ± 0.5 mm TRAVEL FROM TERM. 1	30 ± 2 dB
42 ± 0.5 mm TRAVEL FROM TERM. 1	20 ± 1.5 dB
68 ± 0.5 mm TRAVEL FROM TERM. 1	10 ± 1 dB

				APPD.	CHKD.	DSGD.	NAME
				<i>Jul 2 '92</i>	<i>Jul 2 '92</i>	<i>Jul 2 '92</i>	RESISTANCE TAPER
SYMB.	DATE	APPD.	CHKD.	DSGD.	DWG. NO.		SPS99
		<i>M. Inoue</i>	<i>S. Sasaki</i>	<i>H. Matsuhara</i>			

OR

ご使用上の注意
PRECAUTION IN USE

1. 偏心ツマミをご使用になる場合

レハ^レの中心より離れたところを作用点としてご使用になる場合、可能な限り
 下図A寸法を短くしてご使用下さい。

If it will be used the operating point away from the center line of the lever, it should be shorter as possible.

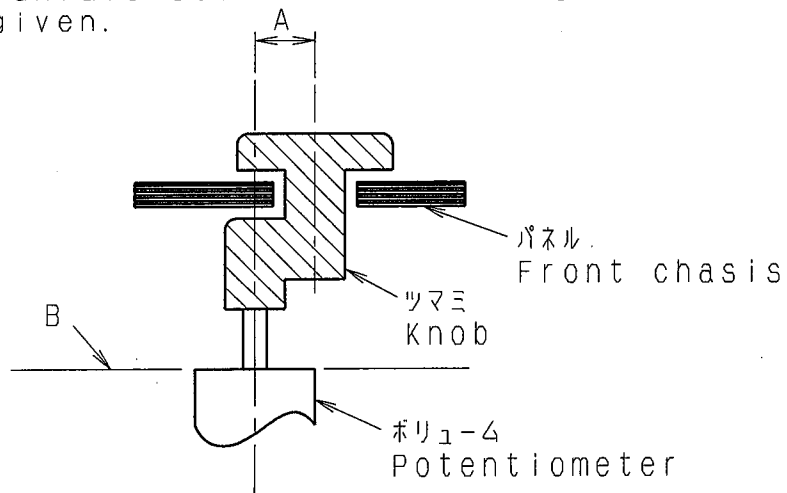
2. レハ^レの長さについて

レハ^レの長さについては、ツマミを含めて、下図B面より極力短いものをご使用願います。レハ^レの長さについては、作用点までの距離が短いほどしゅう動感觸が良好となり、長いほど好ましくない感觸になります。

About the length of lever

If conditions permit, it is advisable to use the shortest possible lever.

The longer the length up to operating point, the more unfavorable slide feeling will be given.



3. レハ^レの駆動に関しては上記内容を考慮の上、セット実装を行い

あらかじめ異常のないことをご確認願います。

Regarding the operation of the lever, please consider the above mentioned, and make sure nothing is wrong with the operation under installing in your appliance that you plan to use our products actually.

4. ツマミ挿入及びレハ^レ操作は、ホ^レリウムマウント基板に

ソリ(曲がり)のない状態で行って下さい。

Knob assembly on the lever and functioning the lever to be performed under the condition of P.C.B. without warp.

5. 電圧調整形回路において出力側のインピーダンスが低い場合には抵抗体と摺動子間の接触抵抗の影響を受けることがありますのでインピーダンスを公称全抵抗値の100倍以上に設定願います。

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.

					ALPS ELECTRIC CO., LTD.			
					APPD. 浦設計試作 07.4.5 池之上	CHKD. 浦設計試作 07.4.5 大矢	DSGD. 浦設計試作 07.4.5 玉田	TITLE スライトホ ^レ リウム仕様書 SPECIFICATIONS
ORIGINAL	1991-07-03	Y·Y	K·N	S·A	DOCUMENT NO.			450001-200
SYMB	DATE	APPD	CHKD	DSGD				

はんだ付け条件

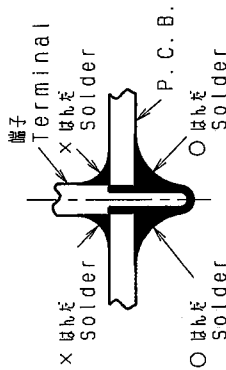
FOLLOW THE NEXT CONDITIONS FOR SOLDERING

1. はんだ SOLDER
JIS Z 3282に規定のA30C5はんだを使用
JIS Z 3282-A30C5
2. 使用基板 BOARD IN USE
片面銅箔基板 板厚 $t=1.6\text{mm}$ ※両面スルーホール基板のご使用はお避け下さい。
Single-face copper laid laminate board.
Plate thickness (t)=1.6mm
Do not use double sided through hole PCB.
3. 手はんだ
はんだ温度 350℃MAX. 時間3秒以内。
はんだ回数は1回までとする。
IN THE CASE OF MANUAL SOLDERING
Solder temperature : 350℃max.
Soldering period : within 3 seconds.
Time of soldering : only one time is permitted.

4. 注意事項

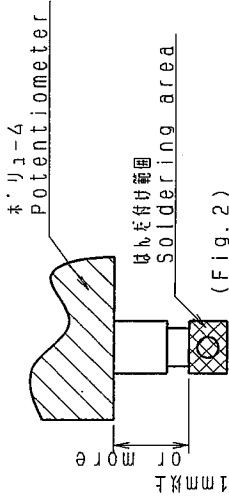
- (1) はんだ付けの際に、端子にストレスを加えないで下さい。例えば、端子に熱を加えそのまま製品を動かしますと、かしの部材より電氣的特性が劣化する恐れがあります。
 - (2) はんだ熱による端子接触不良の発生原因となりますので、ホリウム挿入側に、はんだが上から多いようにはんだ付けして下さい。(図1)
- MATTERS TO BE NOTED
- (1) Do not add any stress on terminals in the case of soldering. For instance, forced movement of potentiometer with terminals being heated may probably deteriorate the electric features due to generation of looseness in connection between resistant board and terminals.
 - (2) Use caution to soldering process so as to prevent solder from rising up to the surface of printed board on the side of installing potentiometer, because defective contact may take place in terminal connecting part due to soldering heat.(Fig.1)

ホリウム挿入側
Mounting side



(Fig. 1)
(図 1)

- (3) リード・配線の場合、ホリウム本体と、はんだ付け部の距離は1mm以上空けて、はんだ付けします(図2)
- (3) In the case of lead wiring, solder it so that a gap of 1mm or more may be reserved between the potentiometer body and soldering part.(Fig.2)



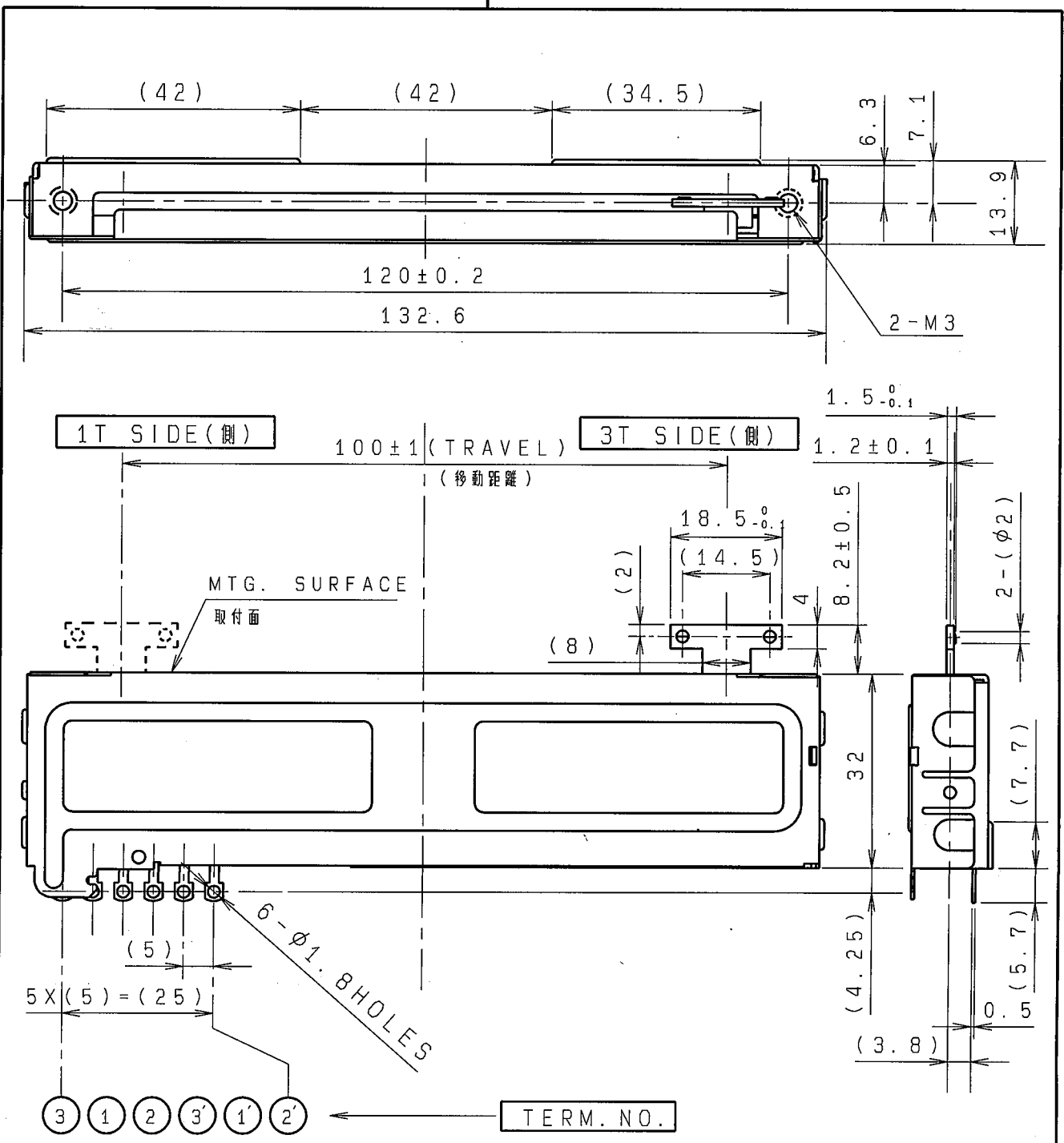
(Fig. 2)
(図 2)

- (4) はんだ付けによるホリウムへの影響は、プリント基板の寸法、ホリウムの取付け位置、はんだ槽の大きさ、等により異なりますのであらかじめ実使用状態を確認し、異常のないことを確認の上、はんだ付けして下さい。
- (4) The grade of influence of soldering exerted on the potentiometer depends upon the size of a printed board, installing position of the potentiometer, and the size of a solder bath etc. Therefore, make sure, in advance, of no abnormal state under the conditions of soldering to be carried out at present.

ALPS ELECTRIC CO., LTD.

SYMB	DATE	APPD	CHKD	DSGD	TITLE	450001-203
					タイトル ホリウム仕様書	
					SPECIFICATIONS	
					DESIGN 08.02.25 Y. OHYA	
					DESIGN 08.02.25 Y. OHYA	
					REWORK 08.02.25 Y. OHYA	
					DOCUMENT NO.	

OR



NOTE 1. MOUNTING SCREW THREAD LENGTH SHALL BE CHASSIS THICKNESS + 4MM MAX.

1. 取付用ネジの首下長さは、シャーシ板厚+4mm以下とする。

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

PART NO.	NAME	MATERIAL NAME / CODE	FINISH
ALPS ELECTRIC CO., LTD.			
		DSGD. Y. SHIMIZU 2009-11-11	SCALE 1:1
		CHKD. R. SUZUKI 2009-11-11	UNIT mm
		APPD. Y. KATO 2009-11-11	DOCUMENT NO. SA02MA911
SYMB	DATE	APPD	CHKD
			DSGD

NO. TLE MASTER TYPE
SLIDE POTENTIOMETER
100MM DUAL UNIT

100形 2連
スライドボリューム