

Customer : ALGE GERMAN DISTRIBUTER

No. SS-2004-5604

Date : Apr. 28, 2004

Attention : \_\_\_\_\_

Your ref. No : \_\_\_\_\_

Your Part. No : ALBS PROMOTION 4673

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

ALPS ;

MODEL RS6011SY6006  
(10kB)

Spec. No. : \_\_\_\_\_

Sample No. : F1445223M

RECEIPT STATUS

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Name \_\_\_\_\_

Title \_\_\_\_\_

ALPS ELECTRIC CO., LTD.

HEAD OFFICE  
1-7, YUKIGAYA-OHTSUKA-CHO,  
OHTA-KU, TOKYO 145-8501 JAPAN

DSG'D Y. Tamada

APP'D S. AIZAWA

Sales \_\_\_\_\_

## SPECIFICATIONS

1. THIS SPECIFICATIONS APPLY TO RS6011SY6006 POTENTIOMETER.

2. CONTENTS OF THIS SPECIFICATIONS.

5S6028S003  
5S6028S-01  
4S0001-200, -201  
S6028D607

3. MARKING

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

• CAUTION

Regardless of the suggested applications of these products being introduced in the specifications, when using them for equipment and devices requiring a high degree of safety, respective manufacturers will please preserve safety of the planned equipment and devices by providing necessary protective circuits and redundancy circuits and reconfirm if safety is being duly preserved.

Products being introduced in the specifications have been designed and manufactured for applications to ordinary electronic equipment and devices such as the AV equipment, electric home appliances, office machines and communications equipment. Consequently, when employing these products for applications requiring a high degree of safety and reliability such as the medical equipment, aviation and aircraft equipment, space equipment and burglar alarm equipment, the using manufacturers will please thoroughly study the proprieties of these products for the planned applications.

Although we are exerting our best efforts to maintain the quality of these products, we cannot guarantee that they will never cause short circuiting and open circuitry. Therefore, when designing an equipment or device with which the priority is given to the safety, you will please carefully study the influences to the whole equipment of a single function failure of Potentiometers and Encoders in advance to make out a fail-safe design providing.

CLASS.NO.	TITLE
	MASTER TYPE POTENTIOMETER(SLIDE)

**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 test 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°C、  
 相対湿度 45~85%、気圧 86~106 kPa の標準状態  
 のもとで行う。

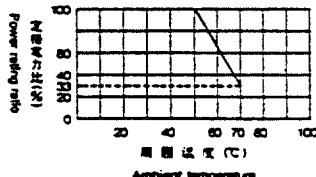
ただし、判定に疑義を生じた場合は温度 20±2°C、  
 相対湿度 60~70%、気圧 86~106 kPa にて行う。


**2. Appearance 外観**

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

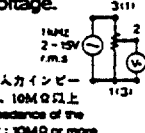
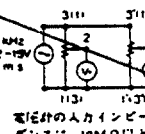
各部の仕上げは良好で機能上有害なサビ、キズ、ワレ、  
 メッキ不良及び剥離などがあってはならない。


**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。	10 KΩ ±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できる最大電力。周囲温度に対する電力軽減曲線は右図とする。 	0.2 W
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越える場合は、この最高使用電圧を定格電圧とする。	DC 10V AC 200V
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 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. Output voltage between terminals 1 and 2 / Applied voltage between terminals 1 and 3 ×100(%) $\frac{1-2 \text{端子間出力電圧}}{1-3 \text{端子間印加電圧}} \times 100(\%)$ Output voltage between terminals 1 and 2 / Applied voltage between terminals 1 and 3 (dB) $20 \log \frac{1-2 \text{端子間出力電圧}}{1-3 \text{端子間印加電圧}} \text{ (dB)}$	Unit (単位) <input checked="" type="checkbox"/> % <input type="checkbox"/> dB  TAPERED CURVE  ALPS "B" (SBS50)

 <b>ALPS ELECTRIC CO., LTD.</b>					
SYMB.	DATE	APPD.	CHKD.	DSGD.	TITLE SPECIFICATIONS
					DOCUMENT NO. 5S6028S003 (1/2)

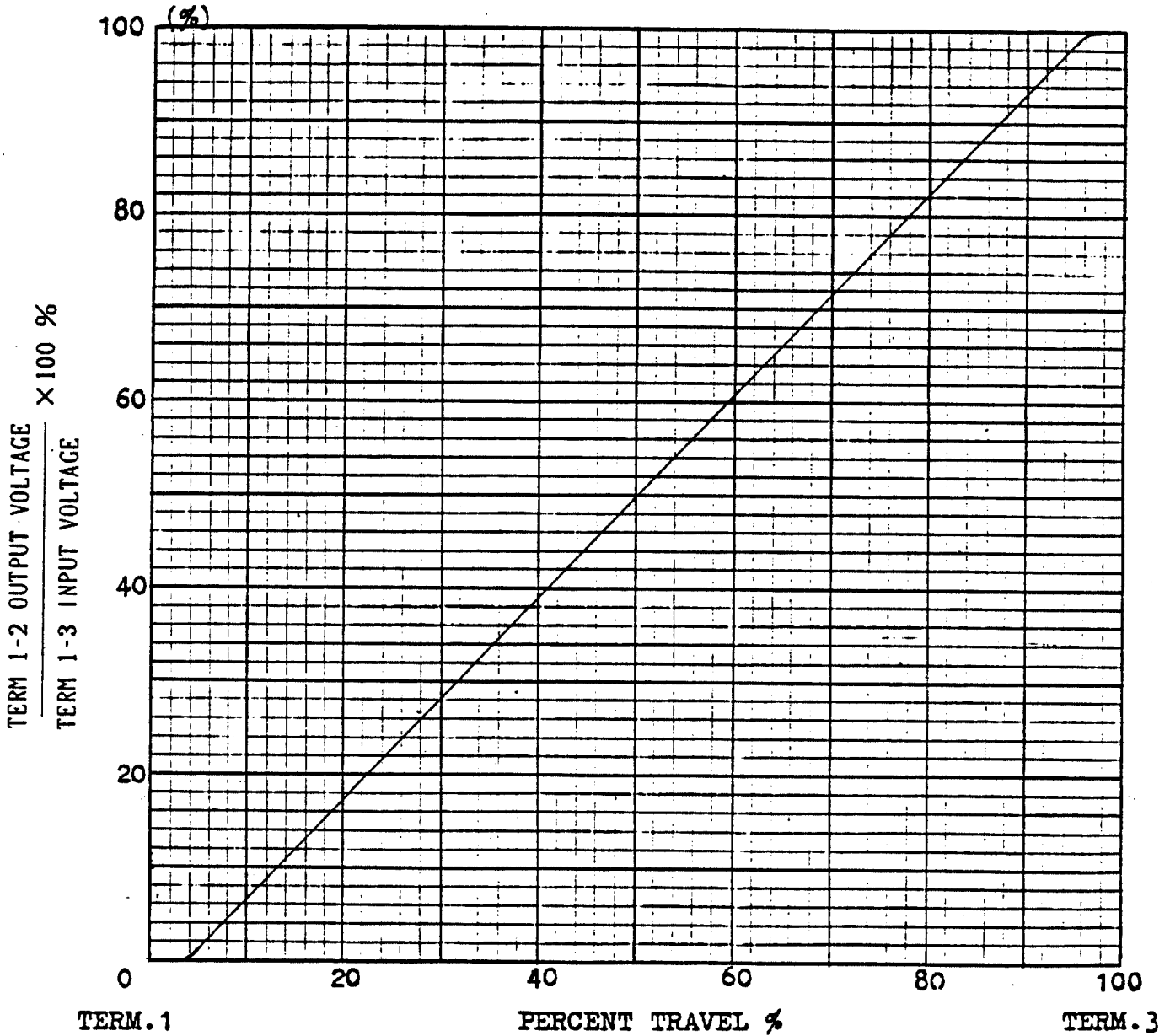
CLASS.NO.	TITLE
	MASTER TYPE POTENTIOMETER(SLIDE)

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 2 Vr.m.s. to 15 Vr.m.s. shall be applied between terminal 1 and 3 by measuring frequency at 1 kHz 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, DC voltage shall be used as the test voltage. 端子1-3間に1kHzで2-15V (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よい。</p>  <p>電圧計の入力インピーダンスは、10MΩ以上 Input impedance of the voltmeter: 10MΩ or more</p>	<p>Attenuation 最大減衰量 <u>70</u> dB or more 以上</p> <p>Insertion loss 挿入損失 within <u>0.1</u> dB以内</p>									
3. 6 Noise しゅう動雑音	<p>DC 20V, when the rated voltage is 20V 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: 20mm/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 5261A法による。</p>	Less than <u>47</u> mVP-P 未満									
3. 7 Insulation resistance 絶縁抵抗	<p>A voltage of 250V DC shall be applied for 1 min., after which measurement shall be made. D.C.250Vの電圧を印加して測定。(1分間)</p>	<p>Between individual terminals and frame/lever Between adjacent terminals 端子-レバー間 端子-枠間 絶縁した抵抗素子の端子間</p> <p><u>100MΩ</u> or more 以上</p>									
3. 8 Dielectric strength 耐電圧	<p>Trip current: 2mA Measuring frequency :50/60Hz 250V AC for 1 min. A.C.250Vr.m.s. 1分間。 感度電流 2 mA(周波数50/60Hz)</p>	<p>Without damage to parts, arcing or breakdown etc. 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 Vr.m.s. to 15 Vr.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 terminals 1 and 2 (for the C and RD 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, DC 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(3端子基準の場合は、端子2-3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よい。</p>  <p>電圧計の入力インピーダンスは、10MΩ以上 Input impedance of the voltmeter: 10MΩ or more</p>	<p>At 50% of lever travel 移動距離の50%の位置</p> <p>± dB</p> <table border="1"> <tr> <td>dB</td> <td>dB</td> <td>± dB</td> </tr> <tr> <td>dB</td> <td>dB</td> <td>± dB</td> </tr> <tr> <td>dB</td> <td>dB</td> <td>± dB</td> </tr> </table>	dB	dB	± dB	dB	dB	± dB	dB	dB	± dB
dB	dB	± dB									
dB	dB	± dB									
dB	dB	± dB									

				 <b>ALPS ELECTRIC CO., LTD.</b>	
		APPD.	CHKD.	DSGD.	TITLE
		1機-2G			SPECIFICATIONS
		00.2.01			DOCUMENT NO.
		相沢			5S6028S003 (2/2)
SYMB.	DATE	APPD.	CHKD.	DSGD.	

USED ON 60 mm TRAVEL TYPE TONE	NAME RESISTANCE TAPER
 ALPS ELECTRIC CO., LTD. 1-7 YUKIGAYA OTSUKA-CHO OTA-KU TOKYO JAPAN	TITLE SPECIFICATIONS

TAPERED CURVE: ALPS "B"



NOTES: PERCENT VOLTAGE  
CHECK POINT

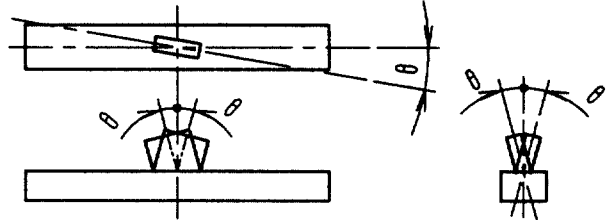
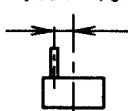
TOLERANCE

50% TRAVEL FROM TERM. 1

40 - 60 %

		APFD.	CHKD.	DSGD.	NAME
		<i>Apr 25 '87</i>	/	<i>Apr 27 '87</i>	RESISTANCE TAPER
SYMB.	DATE	APFD.	CHKD.	DSGD.	DWG. NO.
		<i>M. Orum</i>		<i>S. Suzuki</i>	SBS 50

4. Mechanical characteristics 機械的性能

Item 項目	Conditions 条件	Specifications 規格
4.1 Lever travel レハ'-移動距離		60 ± 0.5 mm
4.2 Operating force 作動力	Traveling speed : 20mm/s Operating position : Tip of the lever 移動速度は20mm/秒とする。 操作位置はレハ'-先端部とする。	0.1 ~ 2 N
Starting force 始動力	Traveling speed : 20mm/s. Operating position : Tip of the lever 移動速度は20mm/秒とする。 操作位置はレハ'-先端部とする。	Operating force + 1N MAX. 作動力 + 1N 以下
4.3 Lever travel stop strength レハ'-の移動止強度	A static load of 100N shall be applied at the point 5mm from top surface of the case for both ends in the direction of lever travel for 10s. レハ'移動距離の高末端において、枠上面より5mmの位置に100Nの力を10秒間加える。	Without excessive play or poor contact. 著しいカ'タ及び接触不良を生じない事。
4.4 Side thrust of the lever レハ'-の横押し強度	A static load of 20N shall be applied at the point 5mm from top surface of the case in a direction perpendicular to the axial direction for 10s. with the potentiometer mounted in assembly conditions. 本体をシャーシに固定し、枠上面より5mmの位置にレハ'-移動方向に対して直角方向に20Nの力を10秒間加える。	Without deformation or breaks in the sliding part and contact part. 操作部及び関連部品に変形、破損がない事。
4.5 Thrust and tensile lever レハ'-の押し引き強度	Thrust and tensile static load of 50N shall be applied to the potentiometer in the lever direction for 10s. レハ'-の押し方向及び引き方向に、50Nの力を10秒間加える。	Without damage such as bad sliding and braking or play in the lever. Electrical characteristics shall be satisfied. レハ'-のカ'タ及び破損、レハ'曲ムラ等がなく、電気的性能を満足する事。
4.6 Displacement of lever レハ'-の横揺れ	A torsion moment of 25mN·m shall be applied at the lever in a direction perpendicular to the axial direction and then the displacement shall be measured. レハ'-に25mN·mの曲げモーメントを移動方向に対して、直角に加えレハ'-先端で測定する。	2(2xL/25)mmP-P or less 以下 L=Lenght of lever レハ'-長さ
4.7 Lever inclination and torsion レハ'-の傾き及びねじれ		θ shall be 2° or less. Return to the same position after torsion. θ は2度以下。 又、ひねりを加えを時、元に戻る事。
4.8 Distance from the center of the lever レハ'-のセンターズレ	After sliding lever as far as it will go in each direction, the distance from the center of the lever to the middle of the mounting screw hole shall be measured at the both ends. 取付けネジ'穴中心に対するレハ'-のセンターからのずれを、片側ごとに測定する。 	0.5mm or less on each end. 片側 0.5mm以下
4.9 Resistance to soldering heat はんだ耐量	Bit temperature : 350°C or less Application time of soldering iron : 5 s or less 温度350°C以下、時間5秒以内。 但し、端子に異常加圧のない事。	Change in total resistance is relative to the value before test: 5% without excessive looseness of terminals and failure contact 全抵抗値の変化は初測値の±5%以内。 著しいカ'タ、接触不良を生じない事。

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APPD	CHKD	DSGD.	TITLE	
1枚-2G 00.1.31 相沢	10-20 00.1.28 阿部	00.1.26	SPECIFICATIONS	
SYMB	DATE	APPD	CHKD	DSGD
			DOCUMENT NO.	5560285-01 (1/3)

⑤  
スレ-ヤ72-9"

### 5. Endurance 耐久性能

Measurement of the endurance characteristics shall be made after 5 cycles' slide of moving contact

耐久性能後の測定は、レハ'-を5サイクルしゅう動後とする。

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 30000±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、1日連続5000~8000サイクル、合計30000±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: 0.1N~2N 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未満作動力は、0.1N~2N 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の恒温槽中で96時間放置し、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。	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の恒温槽中で240±8時間放置し、常温常湿中に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: 0.1N~2N 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未満作動力は、0.1~2N 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%の恒温恒湿槽中で96±4時間放置し、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。	Change in total resistance is relative to the value before test: +35/-5% Noise: Less than 150mVp-p Operating force: 0.1~2N 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未満作動力は、0.1~2N その他は、(3項)(4項)を満足すること。

					<b>ALPS ALPS ELECTRIC CO., LTD.</b>				
		APPD.	CHKD.	DSGD.	TITLE				
		1枚-2G 00.1.31 相沢		00.128		SPECIFICATIONS			
						DOCUMENT NO.			
						5560285-01 (2/3)			
SYMB	DATE	APPD	CHKD	DSGD					

FOR

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="448 482 1098 774"> <thead> <tr> <th>Step 段階</th> <th>Temperature 温度</th> <th>Duration 時間</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-10±3°C</td> <td>30 min. 30分</td> </tr> <tr> <td>2</td> <td>Standard atmospheric conditions 常湿</td> <td>10~15 min. 10~15分</td> </tr> <tr> <td>3</td> <td>70±2°C</td> <td>30 min. 30分</td> </tr> <tr> <td>4</td> <td>Standard atmospheric conditions 常湿</td> <td>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 常湿	10~15 min. 10~15分	3	70±2°C	30 min. 30分	4	Standard atmospheric conditions 常湿	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: 0.1N~2N 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、0.1N~2N 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 常湿	10~15 min. 10~15分															
3	70±2°C	30 min. 30分															
4	Standard atmospheric conditions 常湿	10~15 min. 10~15分															

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					APPD.	CHKD.	DSGD.	TITLE
					1枚-2G '00.1.31 相	00.1.23 相	00.1.28 相	SPECIFICATIONS
								DOCUMENT NO.
								5560285-01 (3/3)
SYMB	DATE	APPD	CHKD	DSGD				



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<sup>レ</sup>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.

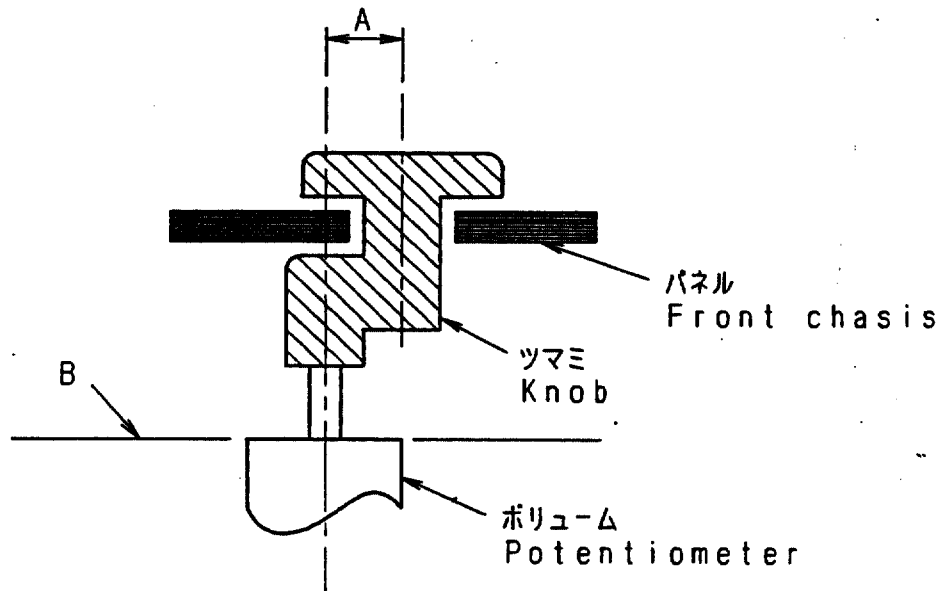
2. レハ<sup>レ</sup>長さについて

レハ<sup>レ</sup>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<sup>レ</sup>長さについては、作用点までの距離が短いほど  
 しゅう動感が良好となり、長いほど好ましくない感触になります。

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<sup>レ</sup>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。

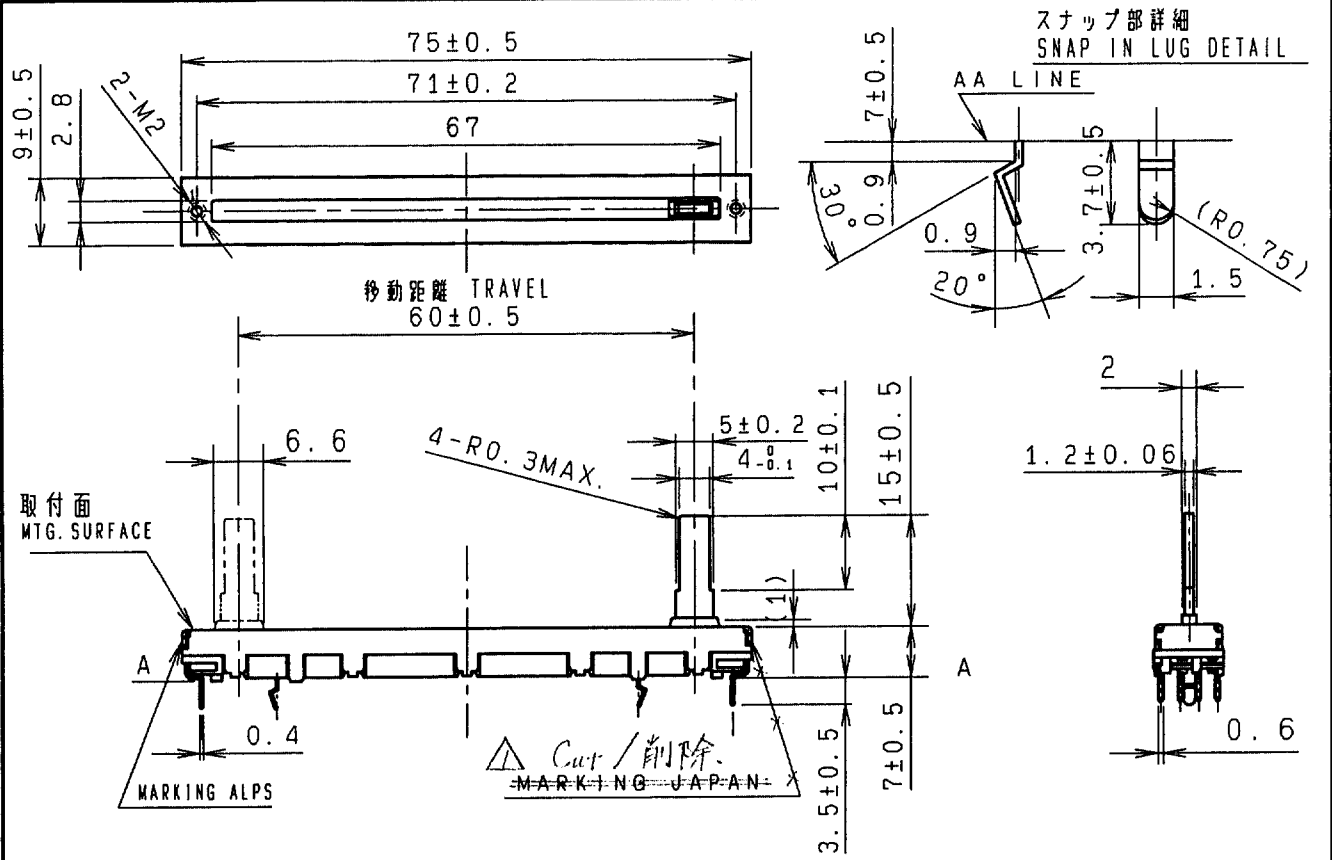
Regarding the operation of the lever, please  
 consider the above mentioned, and make  
 sure nothing is wrong with the operation  
 under installing in your appliance  
 that you plan to use our products actually.

4. ツマミ挿入及びレハ<sup>レ</sup>操作は、ホ<sup>リ</sup>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。

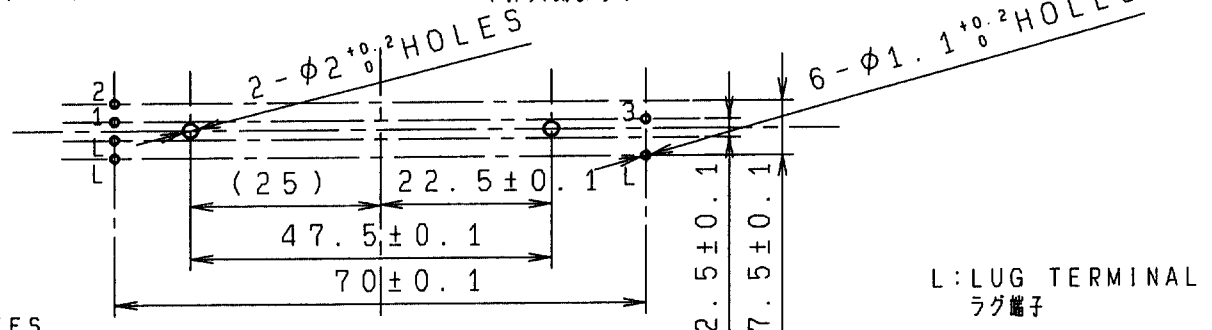
Knob assembly on the lever and functioning  
 the lever to be performed under the condition  
 of P. C. B. without warp.

					<b>ALPS ALPS ELECTRIC CO., LTD.</b>				
					APPD.	CHKD.	DSGD.	TITLE	スライツホ <sup>リ</sup> リウム仕様書 SPECIFICATIONS
					PDI-ENGI '95.7.24 YOSHIOKA	PDI-ENGI '95.7.24 KIMURA	PDI-ENGI '95.7.24 Y.SAITOH	DOCUMENT NO.	4S0001-200
ORIGINAL	91-7-3	Y-Y	K-N	S-A					
SYMB	DATE	APPD	CHKD	DSGD					





MOUNTING HOLE DETAIL 取付穴寸法図  
(FROM MOUNTING SIDE) (挿入側より)



NOTES

1. Mounting screw thread length is chassis thickness+2mm max.  
取付用ネジの首下長さは、シャーシ板厚+2mm以下とする。
2. Within 30mm from "A" included knob's height.  
レハ'-長さは、ツマミも含めて30mm以内でご使用願います。
3. Snap portion is designed based on 1.6mm thick P.C.B.  
スナップ部は、P.C.B.の板厚1.6mm基準にて設計しています。

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

前段:VR  
後段:VR  
取付板付  
板付付  
スナップ付  
④L=0.08  
(H200020)  
別付  
6-152

PART NO.		NAME		MATERIAL NAME / CODE		FINISH	
<b>ALPS ALPS ELECTRIC CO., LTD.</b>							
DSGD. 1-GROUP2				SCALE		NO.	
Y. WATANABE SEP. 16 1999				1:1			
CHKD.				APPD.		TITLE	
S. Abe SEP. 18, 1999				M. Watanabe Sep. 18, 1999		SLIDE POTENTIOMETER SINGLE UNIT	
SYMB				DATE		DOCUMENT NO.	
2003.05.06				浅野 須田 野村		S6028D607	