

Customer : ALGE GERMAN DISTRIBUTER

No. SS-2004-5605

Date : Apr. 28, 2004

Attention :

Your ref. No. :

Your Part. No : ALBS PROMOTION 4674

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

ALPS :

MODEL RS6011DY6
(10kDX2)

Spec. No. :

Sample No. : F1445215M

RECEIPT STATUS

RECEIVED

By Date _____

Signature _____

Name _____

Title _____

ALPS ELECTRIC CO., LTD.

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

DSG'D *y. Yamada*
APP'D *S. AIZAWA*

Sales

24678

SPECIFICATIONS

1. THIS SPECIFICATIONS APPLY TO RS6011SY6 POTENTIOMETER.

2. CONTENTS OF THIS SPECIFICATIONS.

5S6028S021
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 whitch 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)
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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 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.

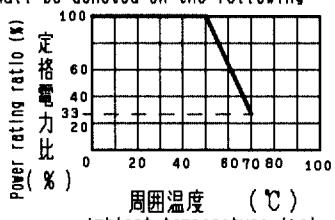
試験及び測定は特に規定がない限り温度5~35°C、
相対湿度45~85%，気圧86~106kpaの標準状態
のもとで行う。

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

2. Appearance 外観

The potentiometer shall be well done and 各部の仕上げは良好で機能上有害なサビ、キズ、ワレ、
not have any excessive rust, crack, split, メッキ不良及び剥離などがあってはならない。
poor plating and discolor in any portion.

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 setted 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。 	0.1W
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. 10V A. C. 150V
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. $\frac{\text{output voltage between terminals 1 and 2}}{\text{Applied voltage between terminals 1 and 3}} \times 100(\%)$ $\frac{1-2端子間出力電圧}{1-3端子間印加電圧} \times 100(\%)$	TAPERED CURVE ALPS 'D' (SDS26)



ALPS ELECTRIC CO., LTD.

APPD	CHKD	DSGD	TITLE		
04.4.28 相沢(署)		04.4.27 玉田(署)	SPECIFICATIONS		
SYMB	DATE	APPD	CHKD	DSGD	DOCUMENT NO.
					556028D025
					(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 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 terminals 2 and 3. If there is not any doubt about the results, D.C. voltage shall be used as the test voltage.</p> <p>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よい。 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>	Attenuation 最大減衰量 70 dB or more Insertion loss 挿入損失 Within 0.1 dB 以内			
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.</p> <p>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>	Less than 47 mV p-p 未満			
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>	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			
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.</p> <p>A. C. 250V r. m. s. 1分間。 感度電流 : 2 mA (周波数 : 50/60 Hz)</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、アーキおよび絶縁破壊を生じないこと。			
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 freqency 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.</p> <p>If there is not any doubt about the results, d.c. voltage shall be used as the test voltage.</p> <p>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よい。 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>	-40dB~0dBにて±3dB			



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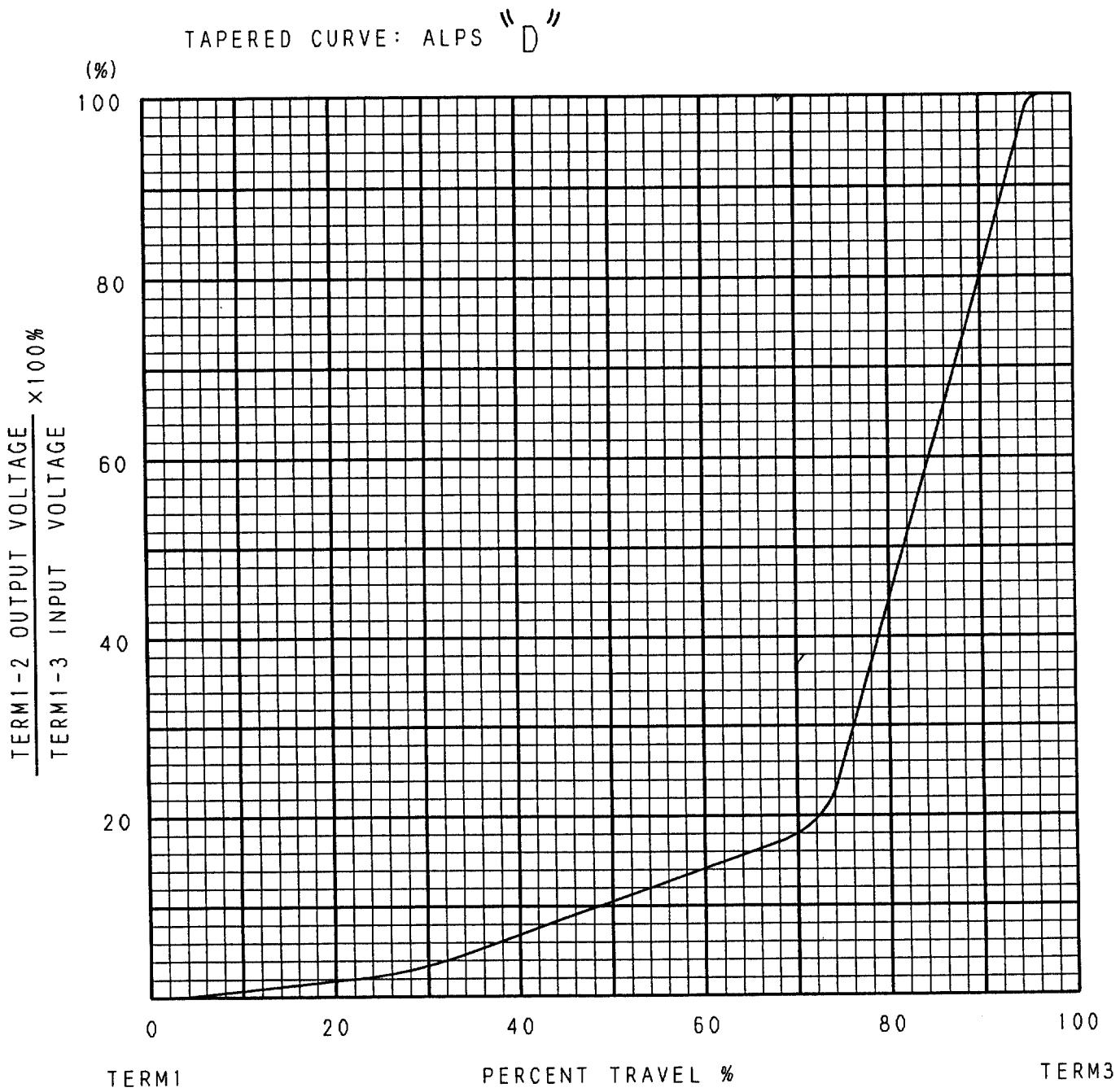
TITLE
SPECIFICATIONS
DOCUMENT NO.

5S6028D025

(2/2)

SYMB	DATE	APPD	CHKD	DSGD			

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



NOTES: PERCENT VOLTAGE
CHECK POINT

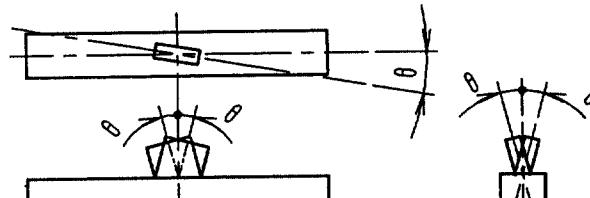
TOLERANCE

50% TRAVEL FROM TERM. 1

6~15%

SYMB.	DATE.	APPD.	CHKD.	DSGD.	APPD.	CHKD.	DSGD.	NAME RESISTANCE TAPER	DOCUMENT NO.
					Sep 20, '96		Sep 19 '96		
					S. Sasahara		H. Matsukawa		SDS26

4. Mechanical characteristics 機械的性能

Item 項目	Conditions 条件	Specifications 規格
4.1 Lever travel レバ'ー移動距離		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。 操作位置はレバ'ー先端部とする。	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。 操作位置はレバ'ー先端部とする。	Operating force + 1N MAX. 作動力 + 1N 以下
4.3 Lever travel stop strength レバ'ーの移動止強度	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. しゅう動距離の両末端において、井上面より5mmの位置に100Nの力を10秒間加える。	without excessive play or poor contact. 苦しい力'タ及び接触不良を生じない事。.
4.4 Side thrust of the lever レバ'ーの横押し強度	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、井上面より5mmの位置にレバ'ー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 レバ'ーの押し引き強度	Thrust and tensile static load of 50N shall be applied to the potentiometer in the lever direction for 10s. レバ'ーの押し方向及び引張り方向に、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. レバ'ーの力'タ及び破損、しゅう動ムラ等がなく、電気的性能を満足する事。
4.6 Displacement of lever レバ'ーの横振れ	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. レバ'ーに25mN·mの曲げモーメントを移動方向に対して、直角に加えレバ'ー先端で測定する。	2(2xL/25)mmP-P or less 以下 L=Length of lever レバ'ー長さ
4.7 Lever inclination and torsion レバ'ーの傾き及びねじれ		θ shall be 2° or less. Return to the same position aftcr torsion. θは2度以下。 又、ひねりを加えた時、元に戻る事。
4.8 Distance from the center of the lever レバ'ーのセンタースペース	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バ'ー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. 片面 0.5mm以下
4.9 Resistance to soldering heat はんだ耐熱	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期値の±5%以内。 苦しい力'タ、接触不良を生じない事。



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APPO 1技-2G 00.1.31 相沢	CHKD 11-20 1.1.28 阿部	DSGD 00.1.28 近藤
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TITLE SPECIFICATIONS	
DOCUMENT NO. 5S6028D-01 (1/3)	

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、レバ'-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	<p>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.)</p> <p>無負荷にてレバ'-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。</p>	<p>Change in total resistance is relative to the value before test: $\pm 15\%$ 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$\pm 15\%$以内 しゅう動騒音は、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>
5.2 Cold 耐寒性	<p>The potentiometer shall be stored at a temperature of $-30 \pm 2^\circ\text{C}$ 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.</p> <p>$-30 \pm 2^\circ\text{C}$の恒温槽中にて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。</p>	<p>Change in total resistance is relative to the value before test: $\pm 20\%$ Clause(3), (4) shall be satisfied.</p> <p>全抵抗値の変化は、初期値の$\pm 20\%$以内 その他は、(3項)(4項)を満足すること。</p>
5.3 Dry heat 耐熱性	<p>The potentiometer shall be stored at a temperature of $70 \pm 2^\circ\text{C}$ 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.</p> <p>$70 \pm 2^\circ\text{C}$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1時間以内に測定する。</p>	<p>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.</p> <p>全抵抗値の変化は、初期値の$+5\sim-30\%$以内 しゅう動騒音は、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。</p>
5.4 Damp heat 耐湿性	<p>The potentiometer shall be stored at a temperature of $40 \pm 2^\circ\text{C}$ 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.</p> <p>$40 \pm 2^\circ\text{C}$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>	<p>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.</p> <p>全抵抗値の変化は、初期値の$+35\sim-5\%$以内 しゅう動騒音は、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。</p>

SYMB	DATE	APPO	CHKD	DSGD	APPO	CHKD	DSGD	TITLE	SPECIFICATIONS
					00.1.31				556028D-01 (2/3)
								DOCUMENT NO.	LOR

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、常温常湿中で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"> <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 常温</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 常温</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%</p> <p>Noise: Less than 150mVp-p</p> <p>Operating force: 0.1N~2N</p> <p>Clause(3), (4) shall be satisfied.</p> <p>全抵抗値の変化は、初期値の±20%以内 しゅう動雜音は、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 常温	10~15 min. 10~15分															
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4	Standard atmospheric conditions 常温	10~15 min. 10~15分															

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APPD	CHKD	DSGD..	TITLE		
00.1.31 相浦	00.1.29 阿部	00.1.28 伊藤	SPECIFICATIONS		
SYMB	DATE	APPD	CHKD	DSGD	DOCUMENT NO.
					556028D-01 (3/3)

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

レバー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.

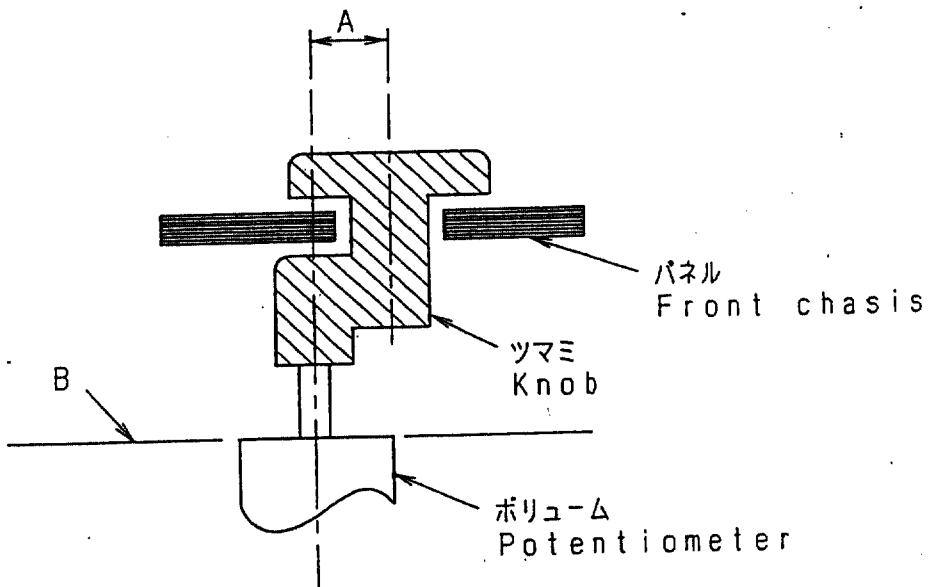
2. レバー長さについて

レバー長さについては、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。レバー長さについては、作用点までの距離が短いほどしゅう動感触が良好となり、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. レバー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。

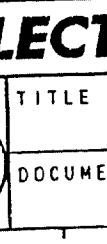
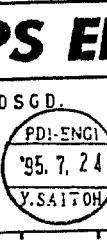
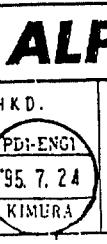
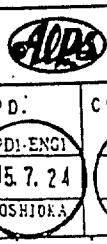
Regarding the operation of the lever, please consider the above mentioned, and make sure nothing is wrong with the operation under installing in your appliance that you plan to use our products actually.

4. ツマミ挿入及びレバー操作は、ボリュームマウント基板に

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.

ORIGINAL	1-7-3	Y-Y	K-N	S-A
SYMB	DATE	APPD	CHKD	DSGD



ALPS ELECTRIC CO., LTD.

APPD:

PDI-ENG1

'95.7.24

CHKD:

PDI-ENG1

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DSGD:

PDI-ENG1

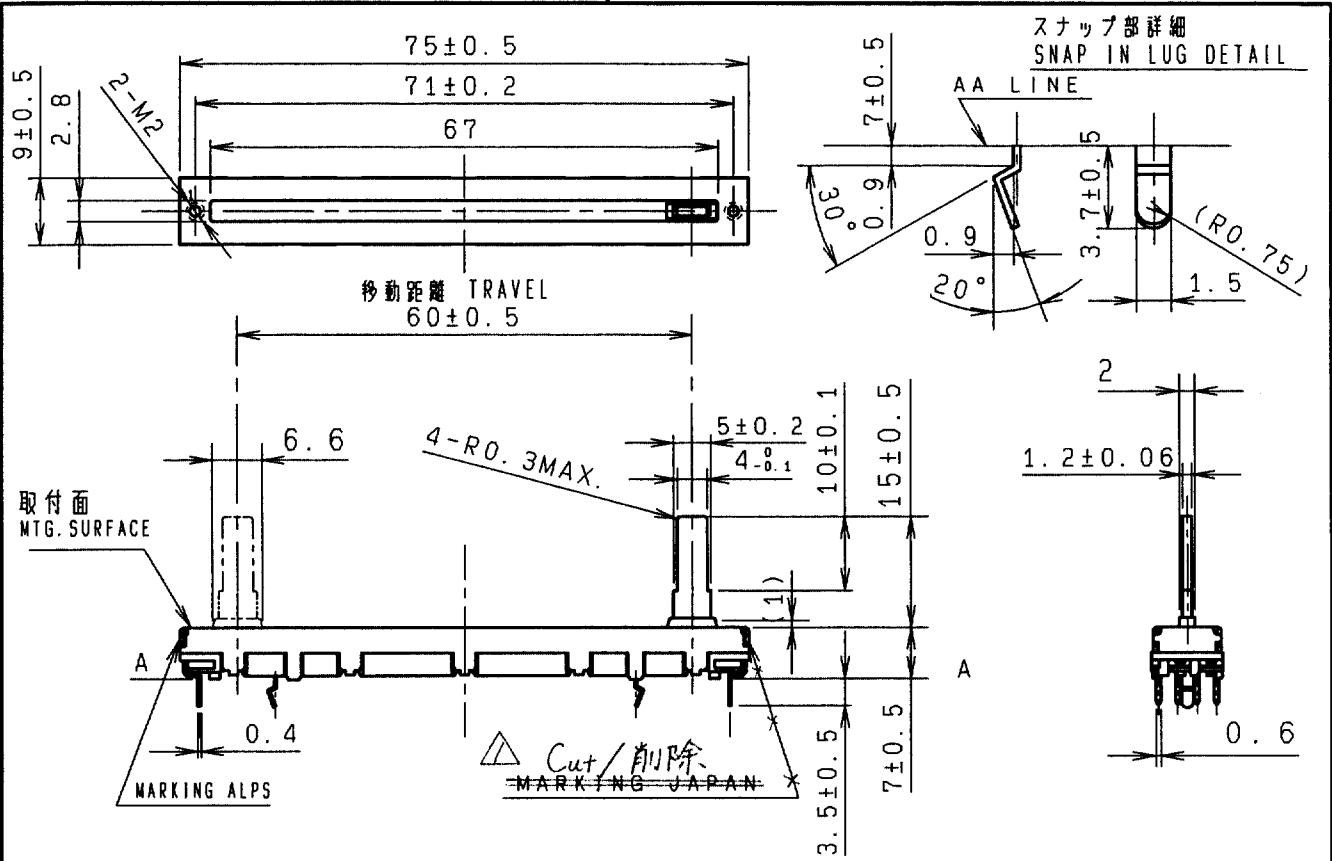
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TITLE

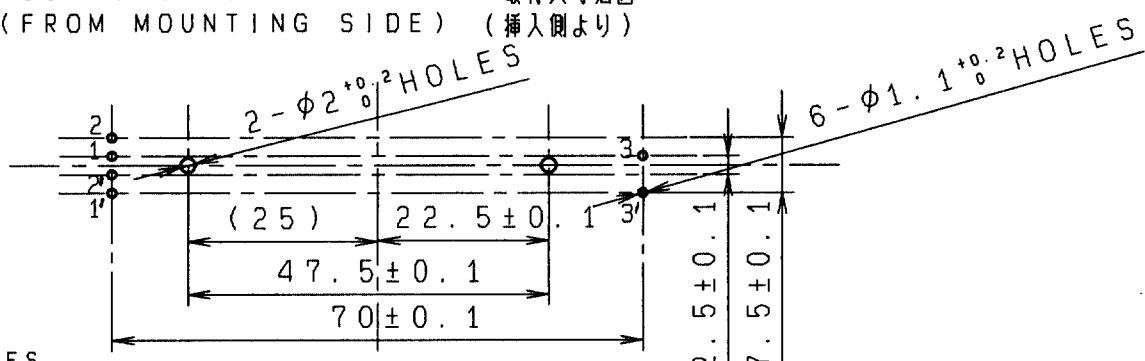
スライド・ボリューム仕様書
SPECIFICATIONS

DOCUMENT NO.

4S0001-200



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



NOTES

- 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。
- Within 30mm from "A" included knob's height.
レバーサー長さは、ツマミも含めて30mm以内でご使用願います。
- 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 < 10	± 0.3
10 < L < 100	± 0.5
100 ≤ L	± 0.8
角度 ANGULAR DIMENSION	
± 5°	

2重
取付板付
板ばね付
スペア付
④ h-0.08
(ID20020)
7月
6-15L.

PART NO.	NAME			MATERIAL NAME / CODE	FINISH	
				 ALPS	ALPS ELECTRIC CO., LTD.	
				DSGD. 1-GROUP2 Y. WATANABE SEP. 16 1999	SCALE 1:1	NO.
				CHKD. <i>S. Abo</i>	Sep. 18, 1999	TITLE SLIDE POTENTIOMETER DUAL UNIT
△	2003.05.06	浅野 須田	APPD	APPD	UNIT m m	DOCUMENT NO. S6028D606
SYMB	DATE	APPD	CHKD	DSGD		99.9.20

ORI