

Customer : AEE-DS

No. SS-96-1742

Date : Oct. 04, 1996

Attention :

Your ref. No :

Your Part. No : 10/ 96/ALPS

SPECIFICATIONS

ALPS' :

MODEL RS60N11M9
(5KB)

Spec. No. :

Sample No. : G1126163M

RECEIPT STATUS
RECEIVED

By. Date

Signature

Name

Title

ALPS ELECTRIC CO., LTD.

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

DSG'D Y. Hatamabe

APP'D K. Nakahara

ENG. DEPT. DIVISION

Sales

SPECIFICATIONS

1. THIS SPECIFICATIONS APPLY TO RS60N11M9 POTENTIOMETERS.

2. CONTENTS OF THIS SPECIFICATIONS.

4S601RM007
4S000RM-04
4S0001-200
S601RM911

3. MARKING

· MARKING ON ALL UNITS
DATE CODE, RESIST. VALUE, TAPER, TRADE MARK

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: 860mbar to 1060mbar.

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: 860mbar to 1060mbar.

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860~1060mbarの標準状態のもとで行う。

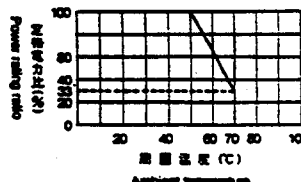
ただし、判定に疑義を生じた場合は温度20±2°C、相対湿度65±5%、気圧860~1060mbarにて行う。

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。

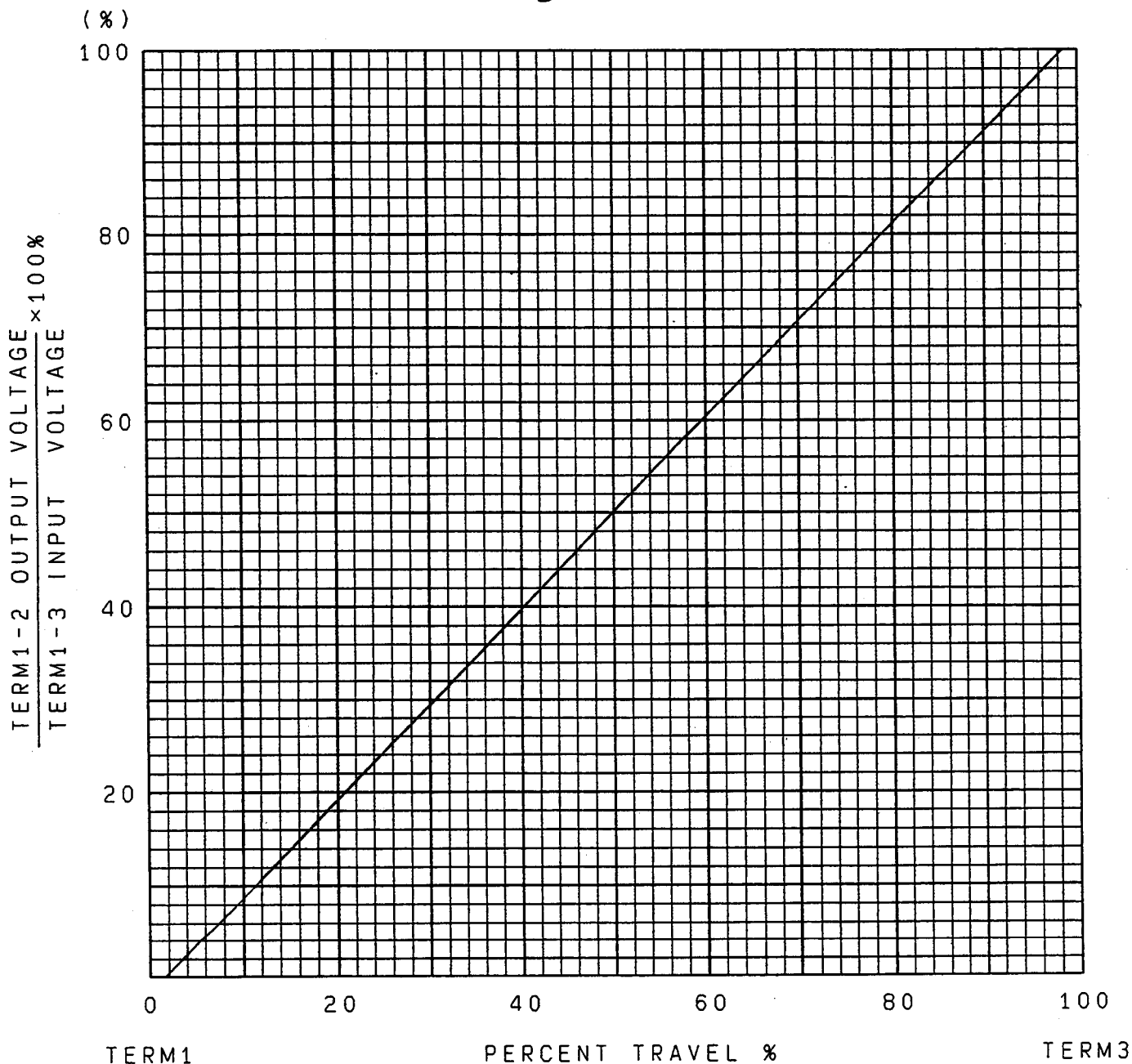
3. Electrical characteristics 電気的性能

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。	5 K Ω ±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。 	0.2 W
3. 3 Rated voltage 定格電圧	Rated voltage $E = \sqrt{PR}$ (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。	A.C. 200 V D.C. 10 V
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 $\frac{1-2 \text{ 端子間出力電圧}}{1-3 \text{ 端子間印加電圧}} \times 100(\%)$ $20 \log \frac{\text{Output voltage between terminals 1 and 2}}{\text{Applied voltage between terminals 1 and 3}} \text{ (dB)}$ $20 \log \frac{1-2 \text{ 端子間出力電圧}}{1-3 \text{ 端子間印加電圧}} \text{ (dB)}$	Unit (単位) ☒ % ☐ dB TAPERED CURVE ALPS "B" (SBS75)

ALPS ELECTRIC CO., LTD.				
SYMB.	DATE	APPD.	CHKD.	DSGD.
		Oct. 04 '96	Oct. 03 '96	Oct. 03 '96
		J. Kondo	Y. Nishimura	
TITLE		SPECIFICATIONS		
DOCUMENT NO.		4S601RM007 (1/4)		

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

TAPERD CURVE: ALPS "B"



NOTES: PERCENT VOLTAGE
CHECK POINT

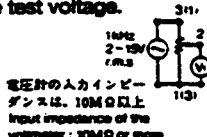
TORERANCE

50% TRAVEL FROM TERM. 1

45 - 55 %

					APPD.	CHKD.	DSGD.	NAME
					Mar 23 '94	Mar 23 '94	Mar 23 '94	RESISTANCE TAPER
Original	Mar 18 '96	M. I	S. S	T. K	K. Megami	H. Matsubara	R. Ogawa	DOCUMENT NO.
SYMB.	DATE.	APPD.	CHKD.	DSGD.				SBS75

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	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。 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。  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	Attenuation <u>70</u> dB or more 最大減衰量 <u>70</u> dB以上 Insertion loss <u>0.1</u> or less 挿入損失 <u>0.1</u> dB以内
3.6	Noise しゅう動雑音	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 Pub. 393-1-6. Test Method B. 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。	Less than <u>47</u> mVP-P 未満
3.7	Insulation resistance 絶縁抵抗	A voltage of 250V DC 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。	Between individual terminals and frame/lever Between adjacent terminals 端子-レバー間 端子-枠間 軸座もた機構素子の端子間 <u>100MΩ</u> or more 以上
3.8	Dielectric strength 耐電圧	Trip current: 2mA Measuring frequency: 50/60Hz 250V AC for 1 min. A.C. 250Vr.m.s. 1分間。 感度電流 2mA (周波数50/60Hz)	Between individual terminals and frame/lever Between adjacent terminals 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。

					ALPS ELECTRIC CO., LTD.			
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					DOCUMENT NO. 4S601RM007			(2/4)
SYMB.	DATE	APPD.	CHKD.	DSGD.	J. Kondo Y. Matsunaga			

CLASS.NO.	TITLE
	MASTER TYPE POTENTIOMETER (SLIDE)

5. Endurance 耐久性能

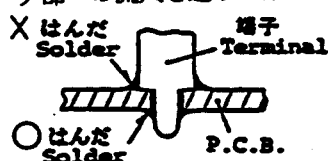
Item 項目	Conditions 条件	Specifications 規格															
5.1 Endurance without load 無負荷しゅう 動寿命	The moving contact, without electrical load, shall be slid from one end stop to the other and returned to its original position extended over 90% or more effective distance. This procedure constitutes 1 cycle. And the moving contact shall be subjected to 600 cycles per hour, a total of 30000 $\pm$ 200 cycles (5,000 to 8,000 continuous cycles for 24 hours.) 無負荷にてレバーを 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 $\pm$ 200 サイクル移動させる。	Change in total resistance is relative to the value before test: $\pm$ 15% Noise: less than 150mVp-p Operating force: 10~200gf 全抵抗値の変化は初期値の $\pm$ 15% 以内 しゅう動雑音は 150mVP-P 未満 作動力 10~200gf															
5.2 Cold 耐寒性	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. $-30 \pm 2^{\circ}\text{C}$ 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。 ただし水滴は、取り除くものとする。	Change in total resistance is relative to the value before test: $\pm$ 20% 全抵抗値の変化は初期値の $\pm$ 20% 以内															
5.3 Dry heat 耐熱性	The potentiometer shall be stored at a temperature of $70 \pm 2^{\circ}\text{C}$ for 240 $\pm$ 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. $70 \pm 2^{\circ}\text{C}$ の恒温槽中にて 240 $\pm$ 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: $\pm$ 30% Noise: less than 150mVp-p Operating force: 10~200gf 全抵抗値の変化は初期値の $\pm$ 30% 以内 しゅう動雑音は 150mVP-P 未満 作動力 10~200gf															
5.4 Damp heat 耐湿性	The potentiometer shall be stored at a temperature of $40 \pm 2^{\circ}\text{C}$ with relative humidity of 90% to 95% for 96 $\pm$ 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. $40 \pm 2^{\circ}\text{C}$ 相対湿度 90~95% の恒温恒湿槽中にて 96 $\pm$ 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。 ただし水滴は、取り除くものとする。	Change in total resistance is relative to the value before test: $\pm$ 5% Noise: less than 150mVp-p Operating force: 10~200gf 全抵抗値の変化は初期値の $\pm$ 5% 以内 しゅう動雑音は 150mVP-P 未満 作動力 10~200gf															
5.5 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 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. 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。ただし水滴は、取り除くものとする。 <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>$-10 \pm 3^{\circ}\text{C}$</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>$70 \pm 2^{\circ}\text{C}$</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	$-10 \pm 3^{\circ}\text{C}$	30 Min. 30分	2	Standard atmospheric conditions 常温	10~15 Min. 10~15分	3	$70 \pm 2^{\circ}\text{C}$	30 Min. 30分	4	Standard atmospheric conditions 常温	10~15 Min. 10~15分	Change in total resistance is relative to the value before test: $\pm$ 20% Noise: less than 150mVp-p Operating force: 10~200gf 全抵抗値の変化は初期値の $\pm$ 20% 以内 しゅう動雑音は 150mVP-P 未満 作動力 10~200gf
Step 段階	Temperature 温度	Duration 時間															
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					4S601RM007 (4/4)	
SYMB.	DATE	APPD.	CHKD.	DSGD.	J. Kondoh / Watanabe	

Caution

ご使用上の注意

- Do not lock the lever for five seconds or more when the motor is supplied with electricity and do not use the motor under the overloaded condition. Please use the master type potentiometer with safety device for protecting the over-current in a motor drive circuit. Because part of the motor is heated excessively and the motor is burned out in case it is used under the overloaded condition continuously.
モータに通電した状態で、レバーを5秒以上固定（ロック）又は、過負荷状態でご使用しないで下さい。
ロック 又は、過負荷状態が持続しますとモータの一部が発熱焼損しますので、過電流防止用の保護回路等の安全装置をご使用下さい。
- Do not supply the electricity which is not capable of driving the lever to the motor for ten seconds or more.
(The value of current is approximately 1 to 300 mA in this case)
Please use the master type potentiometer with safety device for protecting the constant current which is minute current lasted for ten seconds or more in a motor drive circuit. Because part of the motor is heated excessively and the motor is burned out in case it is supplied with the minute current mentioned above constantly.
レバーが動作しない電流（1～300mA程度）をモータに10秒以上通電しないで下さい。通電状態が持続しますとモータの一部が、発熱 焼損します。10秒以上定電流が流れた場合、電源を切る等の回路的な配慮をお願いします。
- Please use the master type potentiometer with a motor-drive circuit which is capable of supplying the sufficient current. This current value is 800 mA. or more.
モータの駆動回路については、800mA以上の電流供給能力を持たせて下さい。
- Do not use the master type potentiometer in the following atmospheric conditions.
Corrosive atmosphere : For example, H_2S , SO_2 , NO_2 , Cl_2
Do not use the master type potentiometer with the following materials.
Poison materials : Especially, siliconized materials, cyano materials formalin, phenolic materials.
腐蝕性ガス（ H_2S , SO_2 , NO_2 , Cl_2 等）はもとより、有害なガス雰囲気中及び有害なガスが発生する物質（特に有機シリコン系、シアン系、ホルマリン系、フェノール系物質等）が存在する場合での使用は避けるようにして下さい。
尚、セット内に於いても上記物質が存在する場合は、事前に十分ご確認下さい。
- Avoid storing the master type potentiometer in unusual atmosphere, for example, high temperature, high humidity, and low temperature.
If you store the master type potentiometer for a long time, be careful about the place for the storage and do not store the master type potentiometer more than six month even if it is stored in usual atmosphere.
保管は上記腐蝕性ガスの雰囲気中及び高温、低温、多湿の場所は避けて下さい。
尚、保管は常温常湿中の6ヶ月以内に止めていただく様ご配慮下さい。
- Avoid soldering process such as to rise up to the surface of printed-wiring-board on the side of installing potentiometer, and use the way of hand-soldering only.
(Please refer to the drawing as follows)
Please use the solder iron for preventing the damage to the master type potentiometer by electrical shock, and solder terminals of the motor as quick as possible for preventing the flux flow into the motor.
図の様にP.C.B.の上面に半田付けをする配線はお避け下さい。（半田付けは、手半田での対応として下さい。）
尚、モータ端子を半田付けする際、半田ゴテはアースの取れているものを使用していただき、フラックスのモータ部への流入を避ける様速やかに行ってください。



Manual Soldering

手はんた
Solder temperature はんだ温度 : 300°C MAX.
Soldering period 時間 : within 3 seconds 3秒以内
Time of soldering はんだ回数 :
only one time is permitted 1回まで

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								4S000RM - 04 (2/2)
SYMB.	DATE	APPD.	CHKD.	DSGD.				
△	Jan. 11 '94	T. H. A.	S. S.					

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.

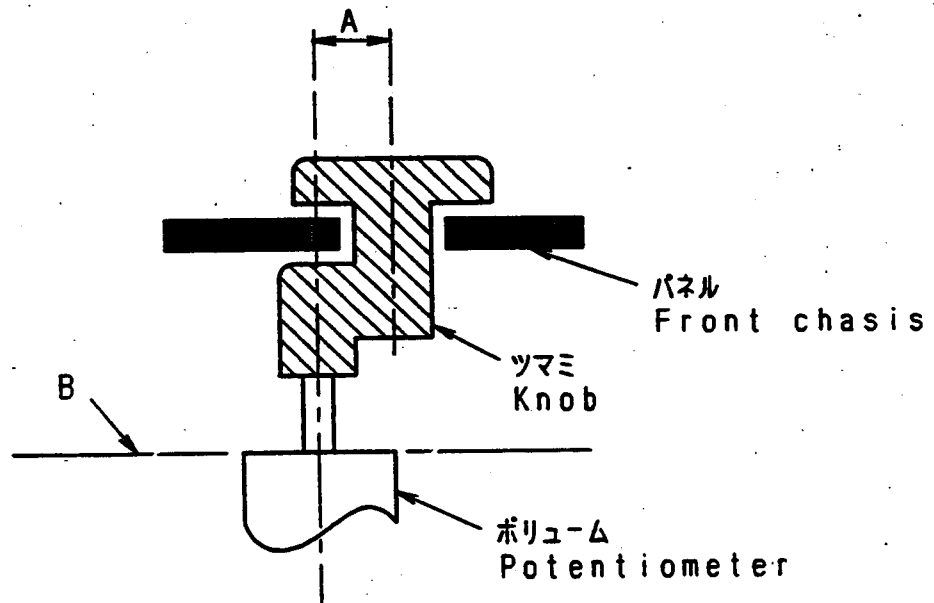
2. レバー長さについて

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覚が良好となり、長いほど好ましくない感覚になります。

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.

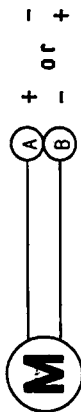
4. ツマミ挿入及びレバー操作は、ボリュームマウント基板に
ソリ(曲がり)のない状態で行って下さい。

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

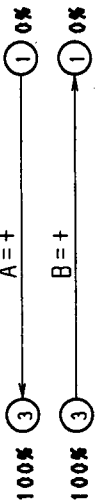
					ALPS ELECTRIC CO., LTD.				
					APPD.	CHKD.	DSGD.	TITLE	
					PDI-ENG1	PDI-ENG1	PDI-ENG1	スライドボリューム仕様書	
					95.7.24	95.7.24	95.7.24	SPECIFICATIONS	
					YOSHIOKA	KIMURA	Y.SAITOH	DOCUMENT NO.	
					4S0001-200				
ORIGINAL	1-7-3	Y-Y	K-N	S-A					
SYMB	DATE	APPD	CHKD	DSGD					

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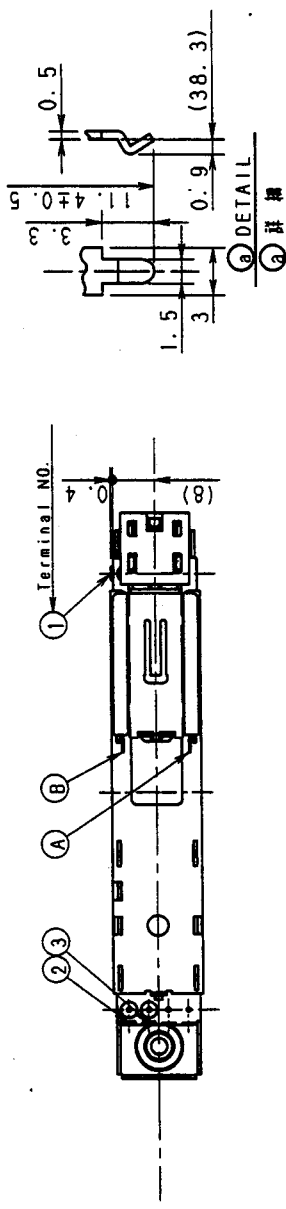
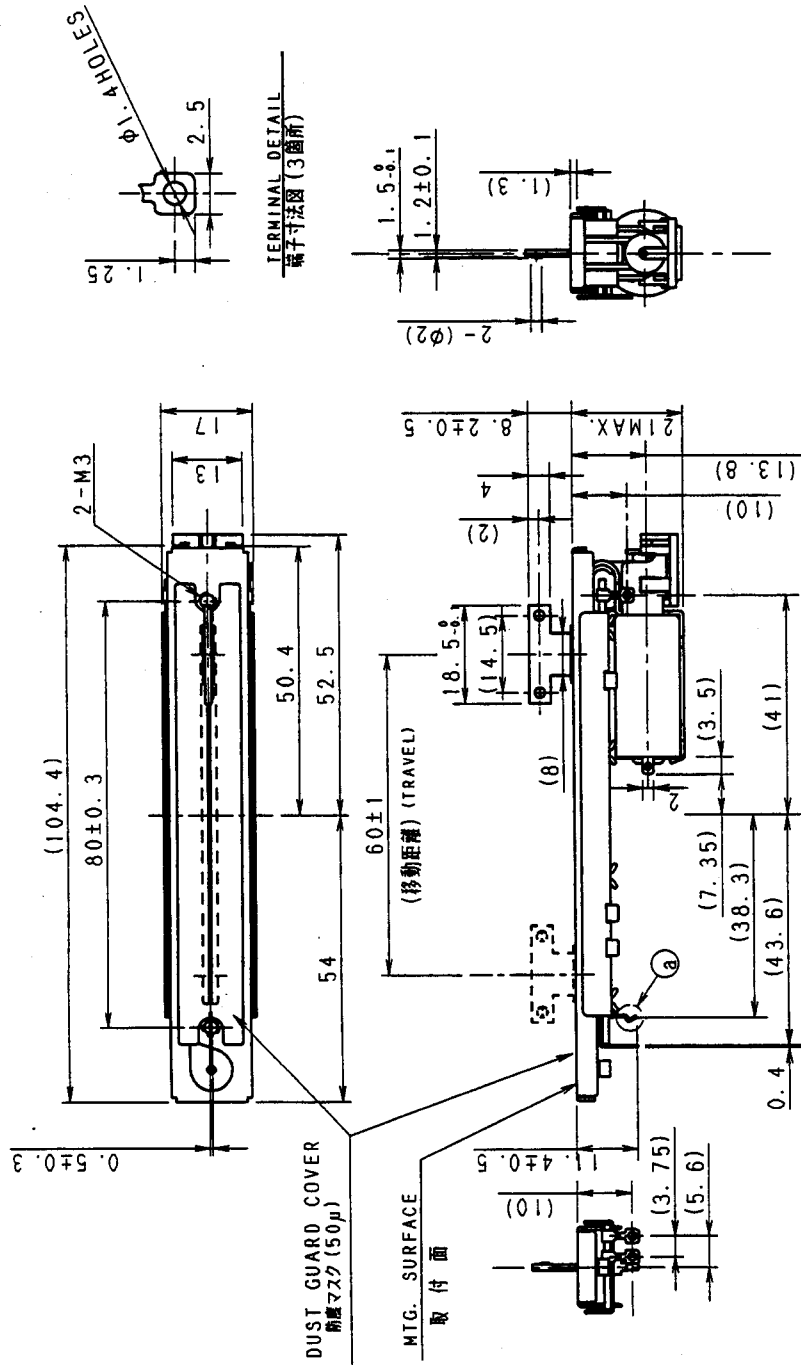
Motor



Moving direction of lever and contacts



Servo track



NOTES 1. MOUNTING SCREW THREAD LENGTH SHALL BE CHASSIS THICKNESS+3mm OR LESS.

2. IN CASE OF PUTTING A KNOB ON THE LEVER, THE HEIGHT OF THE KNOB FROM MTG. SURFACE SHALL BE 25mm OR LESS.

注 記

1. 取付用ネジの首下長さは、シャージ板厚+3mm以下でご使用願います。
2. 取付面からツツマ先端まで25mm以内でご使用願います。

[illegible]