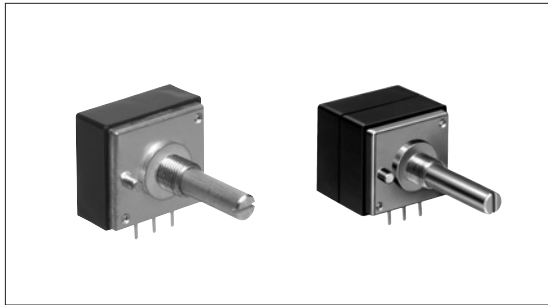


# Metal Shaft Potentiometer 27mm Size Metal Shaft Type

RK27 Series



High performance potentiometer with excellent operational feel.



## Features

- A high class potentiometer offering excellent operational feel and high accuracy (gang error characteristics, resistance taper, etc.) ideal for audio applications.

## Applications

- For level controlling in high class audio equipment
- For various control in mixing consoles

Rotary Potentiometers

Slide Potentiometers

Multi Control Devices

Sensors

Metal Shaft

Insulated Shaft

Hollow Type

Knob Operating

## Typical Specifications

| Items                       | Specifications |
|-----------------------------|----------------|
| Total resistance tolerance  | ±20%           |
| Maximum operating voltage   | 30V AC         |
| Total rotational angle      | 300±3°         |
| Rotational torque           | 8 to 35mN·m    |
| Operating life              | 15,000cycles   |
| Operating temperature range | -10°C to +70°C |

## Recommended Products List

| Number of resistor elements | Mounting direction | Shaft type | Length of the shaft (mm) | Center detent | Total resistance (kΩ) | Resistance taper | Minimum packing unit (pcs.) | Products No. | Draw ing No. |
|-----------------------------|--------------------|------------|--------------------------|---------------|-----------------------|------------------|-----------------------------|--------------|--------------|
| Single-unit                 | Horizontal type    | Slotted    | 25                       | 31            | 100                   | 15A              | 100                         | RK2711120026 | 1            |
|                             |                    |            |                          | Without       |                       |                  |                             | RK271111001T |              |
| Flat                        |                    | 20         | 2                        |               |                       |                  |                             | RK27112A00AK |              |
|                             |                    | 25         |                          |               |                       |                  |                             | RK27112A00CC |              |
|                             |                    | 20         |                          | 3             |                       |                  |                             | RK27112A0A16 |              |
| 25                          | RK27112A00B9       |            |                          |               |                       |                  |                             |              |              |

## Note

Products other than those listed in above recommended products are also available. Please contact us for details.

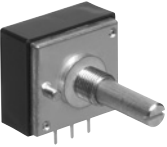
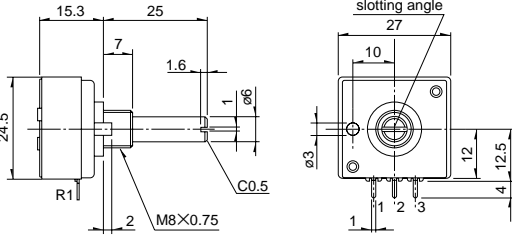
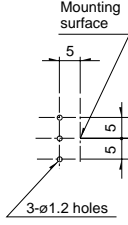
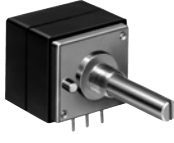
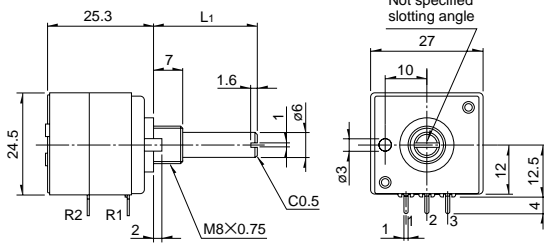
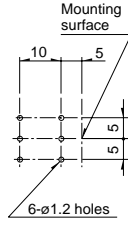
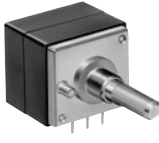
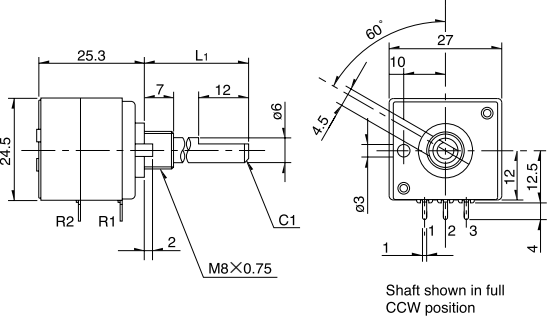
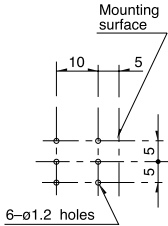
Refer to P.45 for product varieties.  
Refer to P.53 for product specifications.

**Dimensions**

Unit:mm

Rotary Potentiometers  
 Slide Potentiometers  
 Multi Control Devices  
 Sensors

Metal Shaft  
 Insulated Shaft  
 Hollow Type  
 Knob Operating

| No. | Photo   | Style   | PC board mounting hole dimensions (Viewed from mounting side)                         |
|-----|---|---|---|
| 1   |    |                               |    |
| 2   |   | <p>L<sub>1</sub> 20 25</p>   |   |
| 3   |  | <p>L<sub>1</sub> 20 25</p>  |  |

## Product Varieties

In addition to the recommended products, the following specifications can also be accommodated.

### Products Specification

| Type                      | Model   | Mounting height (mm) | Detent variety           | Gang error  |
|---------------------------|---------|----------------------|--------------------------|---|
| Single-shaft, single-unit | RK27111 | 12.5                 | Center<br>21<br>31<br>41 | —60dB to 0dB within 3dB<br>—80dB to —60dB within 5dB possible<br>depending on total resistance and taper. |
| Single-shaft, dual-unit   | RK27112 |                      |                          |   |
| Single-shaft, quad-unit   | RK27114 |                      |                          |   |

Rotary Potentiometers

Slide Potentiometers

Multi Control Devices

Sensors

### Total Resistance Variety

| Total resistance (kΩ) | 5 | 10 | 20 | 50 | 100 | 250 |
|-----------------------|---|----|----|----|-----|-----|
|                       |   |    |    |    |     |     |

### Resistance Taper

| Resistance taper | 15A | 3B |
|------------------|-----|----|
|                  |     |    |

Metal Shaft

Insulated Shaft

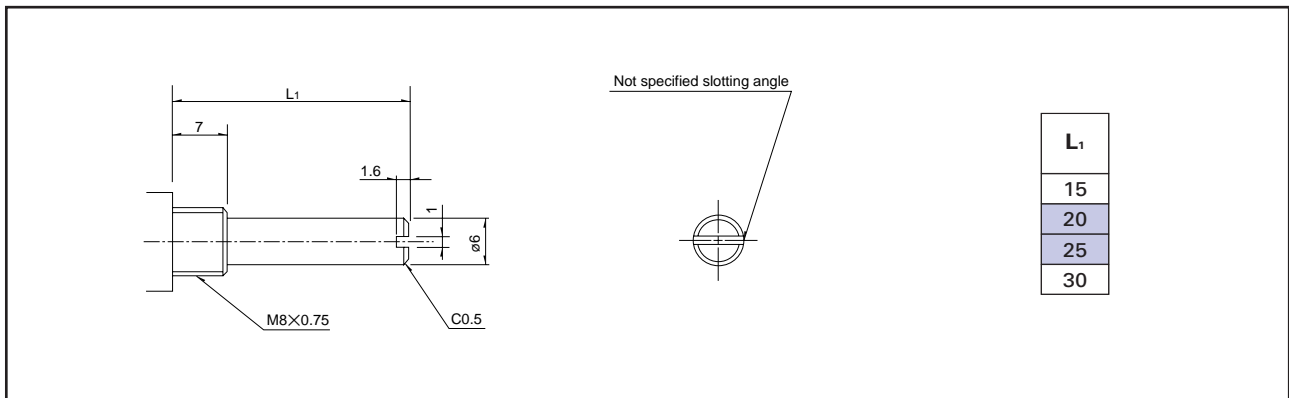
Hollow Type

Knob Operating

### Dimensions of Shaft

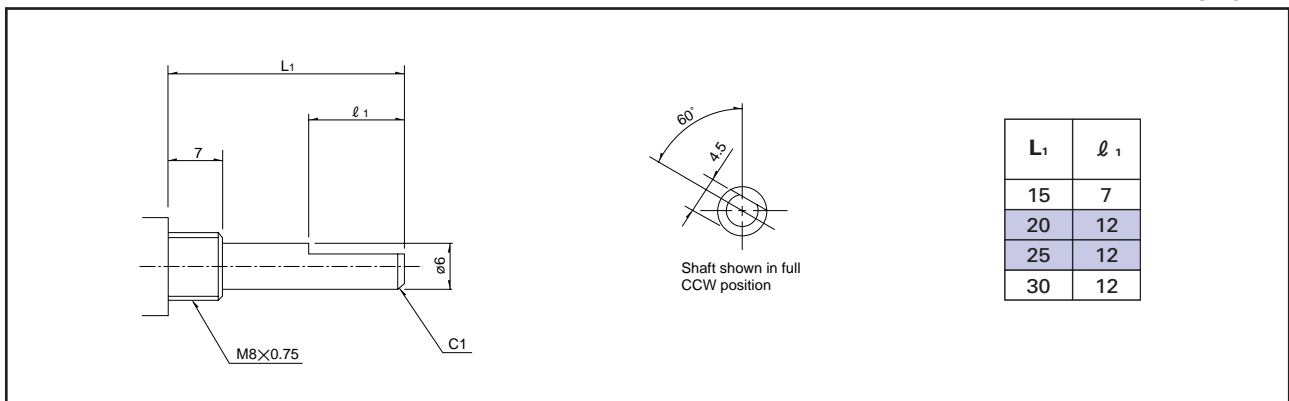
#### 1 Slotted type

Unit:mm



#### 2 Flat type

Unit:mm



### Note

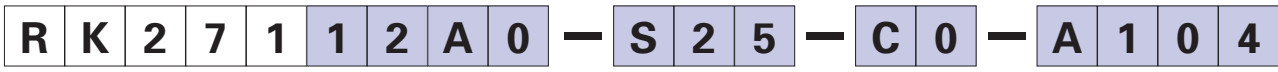
marked are specifications recommended by ALPS.

Refer to P.54 for attached parts.  
Refer to P.46, 211 for resistance taper.

## Orders Other Than Recommended Products

When ordering product varieties that are not listed in the Recommended Product list, please specify by referring to the below example.

### Sample Part Number



#### Model type

| Code | Model type               |
|------|--------------------------|
| 111  | Single unit              |
| 112  | Single unit, with detent |
| 12A  | Dual unit for vol.       |

#### Shaft type

| Code | Shaft type |
|------|------------|
| F    | Flat       |
| S    | Slotted    |

#### Length of the shaft (L<sub>1</sub>) (mm)

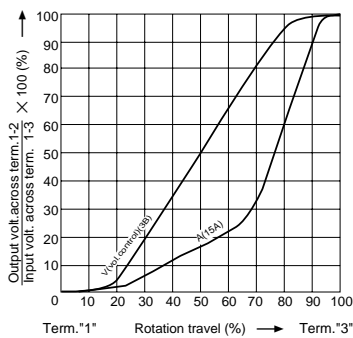
| Code | Length of the shaft |
|------|---------------------|
| 15   | 15                  |
| 20   | 20                  |
| 25   | 25                  |
| 30   | 30                  |

#### Detent

| Code | Detent  |
|------|---------|
| C0   | Without |
| C1   | Center  |
| 21   | 21      |
| 31   | 31      |
| 41   | 41      |

#### Resistance taper

| Code | Resistance taper |
|------|------------------|
| A    | 15A              |
| V    | 3B               |



#### Total resistance

| Code | Total resistance (kΩ) | Code | Total resistance (kΩ) |
|------|-----------------------|------|-----------------------|
| 502  | 5                     | 503  | 50                    |
| 103  | 10                    | 104  | 100                   |
| 203  | 20                    | 254  | 250                   |

#### Note

marked are specifications recommended by ALPS.

Rotary Potentiometers

Slide Potentiometers

Multi Control Devices

Sensors

Metal Shaft

Insulated Shaft

Hollow Type

Knob Operating

## Product Specifications

| Model                              |   | RK203  | RK20B                            | RK271   | RK501  |
|------------------------------------|---|--|----------------------------------|---|--|
| Items                              |   |  |                                  |   |  |
| <b>Operating temperature range</b> |   | -30°C to +80°C   | -10°C to +105°C                  | -10°C to +70°C  |  |
| <b>Electrical performance</b>      | <b>Total resistance tolerance</b>           | ±20%   |                                  |   |  |
|                                    | <b>Rated power</b>                          | 0.05W  | 0.06W                            | 0.05W   | 0.1W   |
|                                    | <b>Maximum operating voltage</b>            | 50V AC<br>30V DC   | 20V DC                           | 30V AC  | 150V AC  |
|                                    | <b>Residual resistance</b>                  | _____  |                                  | R ≤ 10kΩ 20Ω max.<br>10kΩ < R ≤ 50kΩ<br>30Ω max.<br>50kΩ < R<br>0.1% or less of<br>nominal total resistance | _____  |
|                                    | <b>Maximum attenuation (Volume control)</b> | _____  |                                  | 5kΩ ≤ R < 10kΩ 70dB min.<br>10kΩ ≤ R < 50kΩ 80dB min.<br>50kΩ ≤ R < 100kΩ 90dB min.<br>100kΩ ≤ R 100dB min. | 120dB min.   |
|                                    | <b>Insulation resistance</b>                | 100MΩ min. 250V DC   |                                  | 100MΩ min. 500V DC  |  |
| <b>Voltage proof</b>               | 300V AC (for 1minute)                       |  | 500V AC (for 1minute)            |   |  |
| <b>Mechanical performance</b>      | <b>Total rotational angle</b>               | 240° max.  | 360°                             | 300±3°<br>Motor-driven 300±5°   | 300±3°   |
|                                    | <b>Rotational torque (mN·m)</b>             | Shall be in accordance with individual specifications.   | 20 to 80                         | 8 to 35<br>Motor-driven 15 to 45  | 13 to 43   |
|                                    | <b>Stopper strength (N·m)</b>               | 0.5  | _____                            | 0.9   | 1.5  |
|                                    | <b>Push-pull strength</b>                   | 100N max.  |                                  |   | 150N max.  |
|                                    | <b>Vibration</b>                            | 10 to 55 to 10Hz/min., the amplitude is 1.5mm for all the frequencies, in the 3 direction of X, Y and Z and for 2 hours respectively |                                  |   |  |
|                                    | <b>Solder heat resistance</b>               | <b>Manual soldering</b>  | 300°C max. 3s max.               | 350°C max., 3s max.   | 350°C max. 5s max.<br>Motor terminal: 350°C max. 2s max. |
| <b>Dip soldering</b>               |   | 260±5°C, 5±1s  | 260°C max., 5s max.              | _____   | 260±5°C, 5±1s  |
| <b>Reflow soldering</b>            |   | _____  |                                  |   |  |
| <b>Endurance</b>                   | <b>Operating life</b>                       | 30,000cycles   | 15,000cycles                     |   |  |
| <b>Environmental test</b>          | <b>Cold</b>                                 | -40±2°C for 192h   | -30±3°C for 96h                  | -30±3°C for 96h   | -20±3°C for 240h   |
|                                    | <b>Long-term heat resistance</b>            | +85±2°C for 192h   | +105±2°C for 96h                 | +70±2°C for 96h   | +70±2°C for 240h   |
|                                    | <b>Moisture resistance</b>                  | +60±3°C,<br>90 to 95%RH for 240h   | +60±2°C,<br>90 to 95%RH for 240h | +40±2°C,<br>90 to 95%RH for 96h   | +60±2°C,<br>90 to 95%RH for 240h                         |

Rotary Potentiometers

Slide Potentiometers

Multi Control Devices

Sensors

Metal Shaft

Insulated Shaft

Hollow Type

Knob Operating

### Note

The operating temperature range for automotive applications can be raised upon request. Please contact us for requirements of this kind.

## Attached Parts

The following parts are included with the product.

Unit:mm

| Applicable products  | Bearing screw diameter | Hexagonal nut | Flat washer |
|--|------------------------|---------------|-------------|
| <b>RK09L</b><br><b>RK168</b><br><b>RK097</b><br><b>RK203</b> | M9                     |               |             |
| <b>RK271</b>   | M8                     |               |             |
| <b>RK097</b><br><b>RK098</b><br><b>RK163</b>                 | M7                     |               |             |
| <b>RK097</b><br><b>RK098</b>                                 | M6                     |               |             |

Rotary Potentiometers

Slide Potentiometers

Multi Control Devices

Sensors

Metal Shaft

Insulated Shaft

Hollow Type

Knob Operating

Customer : ROXBURGH ELECTRONICS LIMITED

No. KK-96-3855

Date : Jan. 30, 1996

Attention :

Your ref. No :

Your Part. No : 21 1134

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

ALPS :

MODEL   RK27111250K  

Sample No. : G0445311M

|                 |
|-----------------|
| 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. Saitoh

APP'D Y. Yoshitaka

ENG. DEPT. DIVISION

Sales

## SPECIFICATIONS

1. THIS SPECIFICATIONS APPLY TO RK27112B0 POTENTIOMETERS.

2. CONTENTS OF THIS SPECIFICATIONS.

4K272A-210  
HSA02, 4K-1  
K272A0AOK

3. MARKING

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

4. REMARKS

· FURNISH PACKAGE  
NUT: 1, WASHER: 1  
· NOTES

· Silver printed patterns are coated with carbon as a protection against sulphur-  
ation.  
· Marking ⇒ in specifications shows standard and condition for application.



**ELECTRICAL** 50 kΩ  
 1. Total resistance tolerance: Nominal ±20% (10kΩ ≤ R ≤ 2MΩ)  
 2. Rated voltage : Please refer to the attached. ~~Maximum operating voltage 30V A.C.~~  
 3. Resistance taper: See taper figure  
 4. Maximum attenuation level on full C.C.V. position:

| Nominal total resistance value    | Max.att.level |
|-----------------------------------|---------------|
| $R_a \geq 100k\Omega$             | 100dB min.    |
| $100k\Omega > R_a \geq 50k\Omega$ | 90dB min.     |
| $50k\Omega > R_a \geq 10k\Omega$  | 80dB min.     |

5. Insertion loss on full C.V. position: 0.1dB max.  
 6. Slider noise: less than 47mV (by method of JIS C 6443)  
 7. Insulation resistance: 100MΩ min. at 500V D.C.  
 8. Dielectric strength: Units shall be designed to withstand 500V A.C. 50Hz R.M.S. between resistance element and case for a period of one minute without damage or arcing  
 9. Gang error :

| Nominal total resistance value | Gang error   |
|--------------------------------|--|
| $R \geq 50k\Omega$             | 3 dB max. between -70 less than -60 dB<br>2 dB max. between -60 ~ 0 dB |
| $50k\Omega > R \geq 20k\Omega$ | 3 dB max. between -60 less than -40 dB<br>2 dB max. between -40 ~ 0 dB |
| $20k\Omega > R \geq 10k\Omega$ | 3 dB max. between -60 ~ 0 dB   |

( term 1-2 output V  
term 1-3 in out V )

**ALPS ELECTRIC CO., LTD.**

|                     |                     |              |                  |
|---------------------|---------------------|--------------|------------------|
| APPD.<br>Jan 9, '88 | CHKD.<br>Jan 9, '88 | DSGDN<br>Jan | TITLE            |
| DOCUMENT NO.        |                     |              | 4K272A-210 (1/2) |
| SYMB                | DATE                | APPD         | CHKD             |
| Δ 1                 | 13-1-20             | K. Y.        | Y. S.            |

**MECHANICAL**  
 1. Total rotation angle: 300° ± 3°  
 2. Operation torque: 60~350 gf·cm (Rotational speed at 60°/sec., at 20°C)  
 3. Shaft end stop strength: 9kgf·cm min.  
 4. Resistance to soldering heat: After soldering (less than 350°C and quicker than 5 seconds) there shall be no evidence of poor contact between resistance element and terminals, or any physical damages as a result of the test  
 5. Nut tightening strength: 15kgf·cm min.  
 (Pay attention as following otherwise the strength may not be assured)  
 6. Shaft push / pull strength:  
 No damages with an application of push or pull force 10kgf for 10 seconds  
 7. Detent angle: 150° ± 3°  
 8. Detent torque: Operation torque + (50 ~ 300)gf·cm

**ENDURANCE**  
 1. Rotational life: 15,000 cycles min.

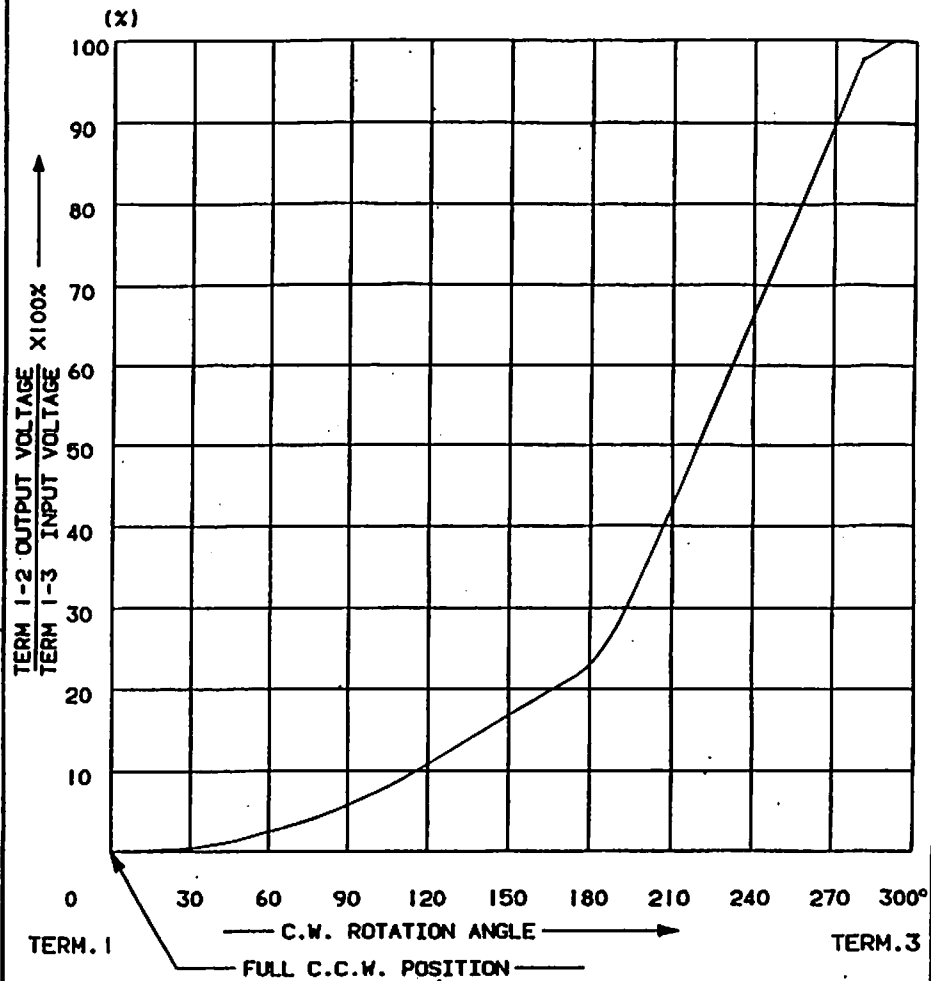
**NOTE**  
 1. The items except above mentioned items shall meet or exceed JIS C 6443.

**ALPS ELECTRIC CO., LTD.**

|                     |                     |              |                  |
|---------------------|---------------------|--------------|------------------|
| APPD.<br>Jan 9, '88 | CHKD.<br>Jan 9, '88 | DSGDN<br>Jan | TITLE            |
| DOCUMENT NO.        |                     |              | 4K272A-210 (2/2) |
| SYMB                | DATE                | APPD         | CHKD             |
| Δ 1                 | 13-1-20             | K. Y.        | Y. S.            |



ALPS ELECTRIC CO., LTD  
1-7 YUKIGAYA OTSUKA-CHO OTA-KU TOKYO JAPAN



AT 180° C.W. SHAFT ROTATION FROM FULL C.C.W. POSITION, VOLTAGE PERCENT SHALL FALL WITHIN THE LIMITS OF 15 - 30PERCENT.

|       |          |      |      |      |      |                       |       |                  |
|-------|----------|------|------|------|------|-----------------------|-------|------------------|
| APPRO | 15-05-31 | P.L. | T.K. | S.S. | OSGD | K. Chonan Jan. 22 '96 | SCALE |                  |
| CHKD. |          |      |      |      |      | S. Sasaki Jan. 22 '96 |       | TITLE            |
| SYMB  | DATE     | APPO | CHKD | OSGD | UNIT | 4. Ohno Jan. 22 '96   | m m   | RESISTANCE TAPER |
|       |          |      |      |      |      |                       |       | DOCUMENT NO.     |
|       |          |      |      |      |      |                       |       | HSA02            |

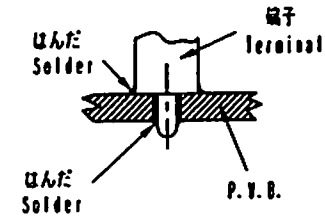
OR

< はんだ付け時の注意事項 >

図のようにP. W. 8の上面に はんだ付けをする配線は、お避け下さい。

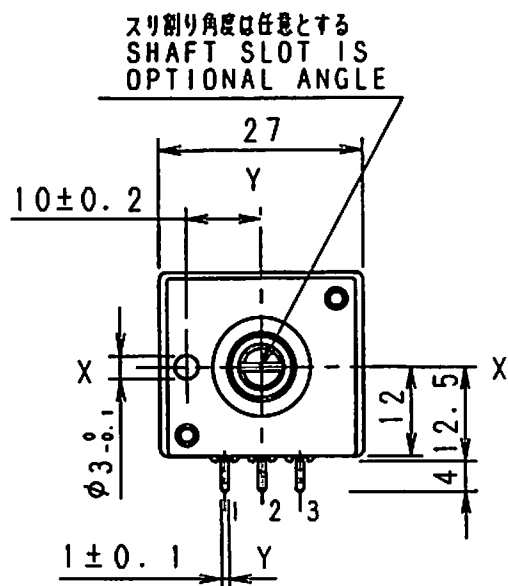
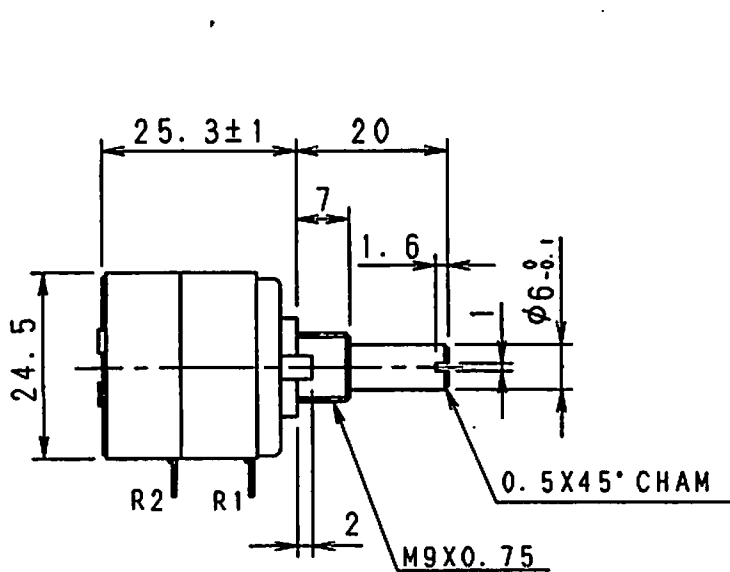
Caution for soldering

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



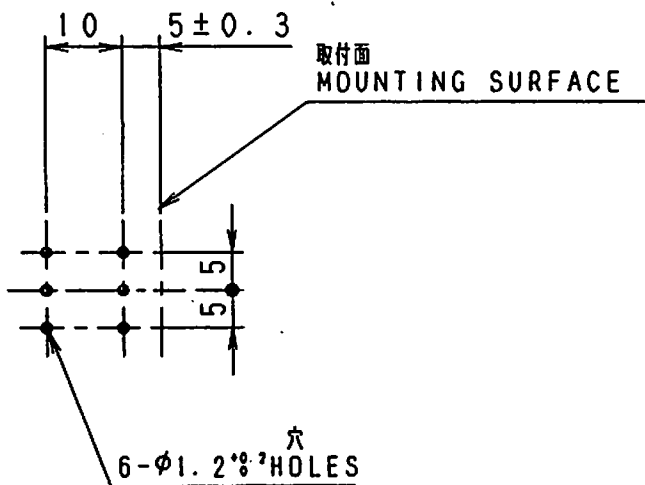
|       |         |      |         |      |                                |              |  |  |
|-------|---------|------|---------|------|--------------------------------|--------------|--|--|
|       |         |      |         |      | <b>ALPS ELECTRIC CO., LTD.</b> |              |  |  |
| APPRO | 1-01    | CHKD | 1-01    | OSGD | 1-01                           | TITLE        |  |  |
|       | 96.1.11 |      | 96.1.11 |      | 96.1.11                        | DOCUMENT NO. |  |  |
|       | 青岡      |      | 佐藤      |      | 大矢                             | 4K-1         |  |  |
| SYMB  | DATE    | APPO | CHKD    | OSGD |                                |              |  |  |

OR



スリ割り角度は任意とする  
SHAFT SLOT IS  
OPTIONAL ANGLE

取付穴寸法図許容差±0.1  
挿入側よりみた図  
P. W. B. MOUNTING DETAIL  
TOLERANCE 0.1  
VIEWED FROM MOUNTING SIDE



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

| PART NO.                       | NAME     | MATERIAL NAME / CODE                     | FINISH                               |
|--------------------------------|----------|--|--------------------------------------|
|                                |          |  |                                      |
| <b>ALPS ELECTRIC CO., LTD.</b> |          |  |                                      |
|                                |          | DSGD. 1-セツキ 906011<br>Y. SAITOH 96-01-31 | SCALE NO:<br>1:1 150° CLICK          |
|                                |          | CHKD.<br>U. Ohya '96.02.01               | TITLE<br>27形1軸2速VR組立図                |
| 初設                             | '83-2-24 | 大谷                                       | APPD.                                |
| SYMB                           | DATE     | APPD                                     | CHKD DSGD                            |
|                                |          |  | UNIT DOCUMENT NO.<br>mm mm K272A0A0K |

OR