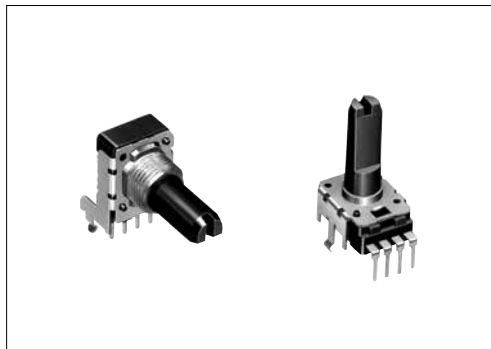


A 1 1 mm wide potentiometer for audio, visual, electronic musical instruments and various applications



#### Typical Specifications



| Items                       | Specifications |
|-----------------------------|----------------|
| Total resistance tolerance  | ±20%           |
| Maximum operating voltage   | 50V AC, 20V DC |
| Total rotational angle      | 300° ±5°       |
| Rotational torque           | 3 to 20mN·m    |
| Operating life              | 15,000 cycles  |
| Operating temperature range | −10°C to +70°C |

#### Product Line

| Number of resistor elements | Mounting direction | Bushing         | Shaft type | Length of the shaft LM <sub>1</sub> (mm) | Center detent | Total resistance (k Ω) | Resistance taper | Minimum order unit (pcs.) |              | Products No. | Drawing No.  |              |
|-----------------------------|--------------------|-----------------|------------|------------------------------------------|---------------|------------------------|------------------|---------------------------|--------------|--------------|--------------|--------------|
|                             |                    |                 |            |                                          |               |                        |                  | Japan                     | Export       |              |              |              |
| Single-unit (20V DC)        | Vertical type      | Without         | Flat       | 15                                       | Without       | 10                     | 1B               | 1,200                     | 2,400        | RK11K1130A2X | 2            |              |
|                             |                    |                 |            | 20                                       |               |                        |                  | With                      | 1,000        | 2,000        |              | RK11K1130A0M |
|                             |                    |                 |            |                                          | 25            |                        |                  |                           | Without      | 20           |              | 800          |
|                             |                    |                 |            | With                                     |               | RK11K113002F           |                  |                           |              |              |              |              |
|                             |                    |                 |            | With                                     | 20            | With                   |                  | 10                        | 1,000        | 2,000        | RK11K114003Y | 4            |
|                             |                    |                 |            |                                          | 22.5          |                        |                  |                           |              |              | Without      |              |
|                             |                    | 25              |            |                                          | With          | 800                    |                  |                           | 1,600        | RK11K1140A23 |              |              |
|                             |                    |                 |            |                                          |               |                        |                  |                           |              | With         | RK11K114001Z |              |
|                             |                    | 27.5            |            |                                          | Without       |                        |                  |                           |              | 20           | RK11K1140A3L |              |
|                             |                    | 30              |            |                                          |               |                        |                  | RK11K1140A4Q              |              |              |              |              |
|                             |                    | 32.5            |            | 10                                       |               | RK11K1140A2S           |                  |                           |              |              |              |              |
|                             |                    | Horizontal type |            | Without                                  | 25            | Without                |                  | 20                        | 1,000        | 2,000        | RK11K1110A3D | 1            |
|                             | 22.5               |                 |            |                                          | With          |                        |                  |                           |              |              | RK11K1120060 | 3            |
|                             | With               |                 |            | 25                                       | 10            |                        |                  | RK11K1120A5T              |              |              |              |              |
|                             |                    |                 |            | 27.5                                     | 20            | 15A                    | 800              | 1,600                     | RK11K1120A31 |              |              |              |

#### Notes

- Other varieties are also available. Refer to "Other Specifications" (P.355).
- Nut and washer are not attached. Please specify if required.

#### Packing Specifications

##### Tray

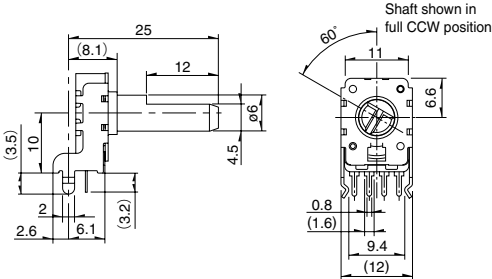
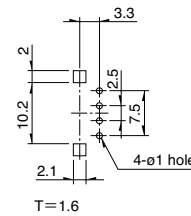
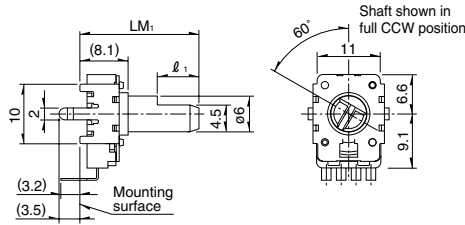
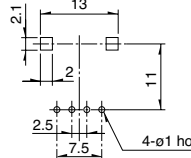
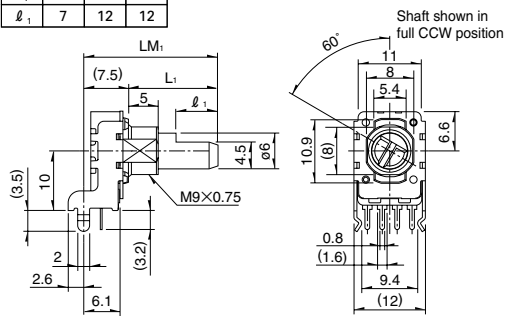
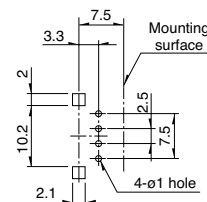
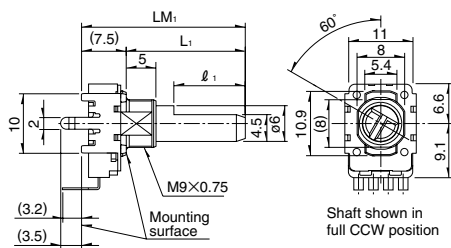
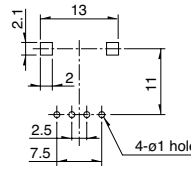
| Length of the shaft LM <sub>1</sub> (mm) | Number of packages (pcs.) |                         | Export package measurements (mm) |
|------------------------------------------|---------------------------|-------------------------|----------------------------------|
|                                          | 1 case / Japan            | 1 case / export packing |                                  |
| 15                                       | 1,200                     | 2,400                   | 543×377×250                      |
| 20 to 22.5                               | 1,000                     | 2,000                   |                                  |
| 25 or more                               | 800                       | 1,600                   |                                  |

Refer to P.355 for other specifications.  
Refer to P.356 for ordering products not listed.  
Refer to P.366 for soldering conditions.

# RK11K 1 1 mm Size Insulated Shaft Snap-in Type

## Dimensions

Unit:mm

| No.             | Photo                                                                                                                                     | Style                                                                                                                                                                                                                                                                                                                                                                                                                                                      | PC board mounting hole dimensions<br>(Viewed from mounting side)                                 |      |      |      |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------|------|------|----------------|-----|------|----------------|--------------------------------------------------------------------------------------|----|------|----|---------------------------------------------------------------------------------------|----|----------------|---|---|----|----|----|----|---------------------------------------------------------------------------------------|
| 1               | <div>Horizontal type without bushing<br/>RK11K111</div>  |  <p>Shaft shown in full CCW position</p>                                                                                                                                                                                                                                                                                                                                 |  <p>T=1.6</p> |      |      |      |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
| 2               | <div>Vertical type without bushing<br/>RK11K113</div>   | <table><tr><td>LM<sub>1</sub></td><td>15</td><td>20</td><td>25</td></tr><tr><td>ℓ<sub>1</sub></td><td>4.5</td><td>7</td><td>12</td></tr></table>  <p>Shaft shown in full CCW position</p>                                                                                                                                                                               | LM <sub>1</sub>                                                                                  | 15   | 20   | 25   | ℓ <sub>1</sub> | 4.5 | 7    | 12             |  |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
| LM <sub>1</sub> | 15                                                                                                                                        | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 25                                                                                               |      |      |      |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
| ℓ <sub>1</sub>  | 4.5                                                                                                                                       | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 12                                                                                               |      |      |      |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
| 3               | <div>Horizontal type with bushing<br/>RK11K112</div>   | <table><tr><td>LM<sub>1</sub></td><td>22.5</td><td>25</td><td>27.5</td></tr><tr><td>L<sub>1</sub></td><td>15</td><td>17.5</td><td>20</td></tr><tr><td>ℓ<sub>1</sub></td><td>7</td><td>12</td><td>12</td></tr></table>  <p>Shaft shown in full CCW position</p>                                                                                                         | LM <sub>1</sub>                                                                                  | 22.5 | 25   | 27.5 | L <sub>1</sub> | 15  | 17.5 | 20             | ℓ <sub>1</sub>                                                                       | 7  | 12   | 12 |  |    |                |   |   |    |    |    |    |                                                                                       |
| LM <sub>1</sub> | 22.5                                                                                                                                      | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 27.5                                                                                             |      |      |      |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
| L <sub>1</sub>  | 15                                                                                                                                        | 17.5                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 20                                                                                               |      |      |      |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
| ℓ <sub>1</sub>  | 7                                                                                                                                         | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 12                                                                                               |      |      |      |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
| 4               | <div>Vertical type with bushing<br/>RK11K114</div>     | <table><tr><td>LM<sub>1</sub></td><td>20</td><td>22.5</td><td>25</td><td>27.5</td><td>30</td><td>32.5</td></tr><tr><td>L<sub>1</sub></td><td>12.5</td><td>15</td><td>17.5</td><td>20</td><td>22.5</td><td>25</td></tr><tr><td>ℓ<sub>1</sub></td><td>7</td><td>7</td><td>12</td><td>12</td><td>12</td><td>12</td></tr></table>  <p>Shaft shown in full CCW position</p> | LM <sub>1</sub>                                                                                  | 20   | 22.5 | 25   | 27.5           | 30  | 32.5 | L <sub>1</sub> | 12.5                                                                                 | 15 | 17.5 | 20 | 22.5                                                                                  | 25 | ℓ <sub>1</sub> | 7 | 7 | 12 | 12 | 12 | 12 |  |
| LM <sub>1</sub> | 20                                                                                                                                        | 22.5                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 25                                                                                               | 27.5 | 30   | 32.5 |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
| L <sub>1</sub>  | 12.5                                                                                                                                      | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 17.5                                                                                             | 20   | 22.5 | 25   |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |
| ℓ <sub>1</sub>  | 7                                                                                                                                         | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 12                                                                                               | 12   | 12   | 12   |                |     |      |                |                                                                                      |    |      |    |                                                                                       |    |                |   |   |    |    |    |    |                                                                                       |

# 1 1 mm Size Insulated Shaft Snap-in Type / Other Specifications

In addition to the products listed, we can accommodate the follow specifications.

## Total Resistance Variety

| Total resistance (k $\Omega$ ) | 5 | 10 | 20 | 50 | 100 | 200 |
|--------------------------------|---|----|----|----|-----|-----|
|--------------------------------|---|----|----|----|-----|-----|

## Resistance Taper

| Resistance taper | 15A | 1B | 3B | 15C |
|------------------|-----|----|----|-----|
|------------------|-----|----|----|-----|

## Tapped Types are Also Available

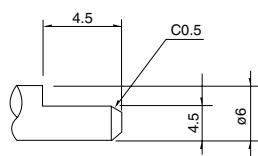
RK11K (single-unit) is also available with tap.

## Shaft Variety

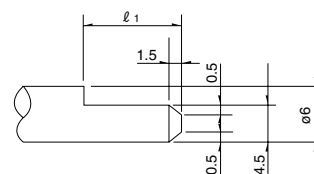
Unit:mm

| Style         |                 | Without bushing |    |               |    | With bushing    |      |               |      |      |      |
|---------------|-----------------|-----------------|----|---------------|----|-----------------|------|---------------|------|------|------|
|               |                 | Horizontal type |    | Vertical type |    | Horizontal type |      | Vertical type |      |      |      |
| Shaft variety | LM <sub>1</sub> | 15              | 20 | 25            | 30 | 20              | 22.5 | 25            | 27.5 | 30   | 32.5 |
|               | L <sub>1</sub>  | —               | —  | —             | —  | 12.5            | 15   | 17.5          | 20   | 22.5 | 25   |
|               | $\ell_1$        | 4.5             | 7  | 12            | 12 | 7               | 7    | 12            | 12   | 12   | 12   |
|               | L <sub>B</sub>  | —               | —  | —             | —  | 5               | 5    | 5             | 5    | 5    | 5    |

Detail dimensions



LM<sub>1</sub> = 15 only application



## Terminal Layout / Circuit Diagram

| Without tap | With tap |
|-------------|----------|
|             |          |

## Note

Marked are specifications recommended by Alps Alpine.

Refer to P.356 for ordering products not listed.

# 11 mm Size Insulated Shaft Snap-in Type / Ordering Products Not Listed

When ordering product varieties that are not listed, specify referring to the examples below.

## Sample Part Number

**R K 1 1 K 1 1 4 0** — **F 2 2** — **C 0** — **B 1 0 3**

Model type

| Code | Model type                      |
|------|---------------------------------|
| 1    | Horizontal type without bushing |
| 2    | Horizontal type with bushing    |
| 3    | Vertical type without bushing   |
| 4    | Vertical type with bushing      |

Shaft type

| Code | Shaft type |
|------|------------|
| F    | Flat       |

\*Only available in flat format.

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

| Code | Length of the shaft | Code | Length of the shaft |
|------|---------------------|------|---------------------|
| 15   | 15                  | 25   | 25                  |
| 20   | 20                  | 30   | 30                  |
| 22   | 22.5                | 32   | 32.5                |
| 27   | 27.5                | —    | —                   |

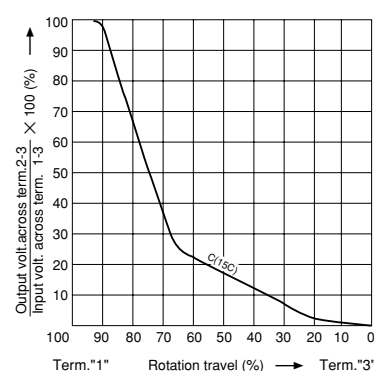
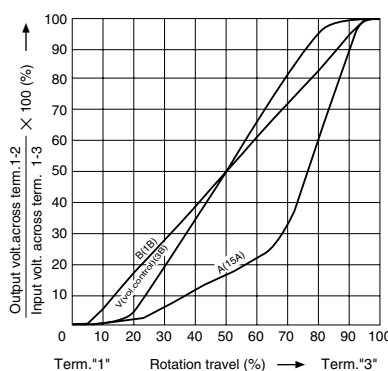
Detent

| Code | Center detent |
|------|---------------|
| C0   | Without       |
| C1   | With          |

Resistance taper

| Code | Resistance taper | Code | Resistance taper |
|------|------------------|------|------------------|
| A    | 15A              | C    | 15C              |
| B    | 1B               | V    | 3B               |

B : For tone & general  
V : For vol.



Total resistance

| Code | Total resistance (k Ω) | Code | Total resistance (k Ω) |
|------|------------------------|------|------------------------|
| 502  | 5                      | 503  | 50                     |
| 103  | 10                     | 104  | 100                    |
| 203  | 20                     | 204  | 200                    |

## Note

Marked are specifications recommended by Alps Alpine.

# Insulated Shaft Potentiometers

## List of Varieties

| Type                         |                            | 9mm size                                                                                                                             |                                                                                   |                                                                                   | 11mm size                                                                          | 12mm size                                                                              | 14mm size                                                                           |
|------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Series                       |                            | RK09K11<br>RK09D11                                                                                                                   | RK09K12                                                                           | RK09Y11L                                                                          | RK11K                                                                              | RK12L12                                                                                | RK14K                                                                               |
|                              |                            | Single-unit                                                                                                                          | Dual-unit                                                                         | Single-unit                                                                       | Single-unit                                                                        | Dual-unit                                                                              | Dual-unit                                                                           |
| Photo                        |                            |                                                     |  |  |  |     |  |
| Terminal mounting            |                            | Vertical / Horizontal                                                                                                                |                                                                                   | Horizontal                                                                        | Vertical / Horizontal                                                              |                                                                                        |                                                                                     |
| Bushing                      |                            | Without                                                                                                                              |                                                                                   |                                                                                   | With / Without                                                                     | Without                                                                                | With / Without                                                                      |
| Operating temperature range  |                            | -10℃ to +70℃                                                                                                                         |                                                                                   |                                                                                   |                                                                                    |                                                                                        |                                                                                     |
| Operating life               |                            | 5,000 cycles                                                                                                                         | 10,000 cycles                                                                     | 1,000,000 cycles                                                                  | 15,000 cycles                                                                      |                                                                                        |                                                                                     |
| Available for automotive use |                            | —                                                                                                                                    | —                                                                                 | —                                                                                 | —                                                                                  | —                                                                                      | —                                                                                   |
| Life cycle                   |                            |                                                     |                                                                                   |  |  |     |  |
| Electrical performance       | Total resistance (k Ω)     | 5, 10, 20, 50, 100, 200                                                                                                              |                                                                                   | 10                                                                                | 5, 10, 20, 50, 100, 200                                                            |                                                                                        |                                                                                     |
|                              | Resistance taper           | 15A, 1B, 3B, 15C                                                                                                                     |                                                                                   | B                                                                                 | 15A, 1B, 3B, 15C                                                                   |                                                                                        |                                                                                     |
|                              | Total resistance tolerance | ±20%                                                                                                                                 | ±30%                                                                              | ±30%                                                                              | ±20%                                                                               |                                                                                        |                                                                                     |
|                              | Rated power                | 0.05W                                                                                                                                | 0.03W                                                                             | 0.01W                                                                             | 0.05W                                                                              |                                                                                        |                                                                                     |
|                              | Maximum operating voltage  | 50V AC<br>20V DC                                                                                                                     | 50V AC<br>for AC only                                                             | 50V AC<br>5V DC                                                                   | 50V AC<br>20V DC                                                                   | 50V AC<br>for AC only                                                                  |                                                                                     |
|                              | Gang error                 | —                                                                                                                                    | -40dB to 0dB<br>3dB max.                                                          | —                                                                                 | —                                                                                  | Volume control<br>-40dB to 0dB 3dB max.<br>For tone control<br>within 2dB<br>at center |                                                                                     |
|                              | Insulation resistance      | 100MΩ min. 250V DC                                                                                                                   |                                                                                   |                                                                                   | 100MΩ min.<br>500V DC                                                              | 100MΩ min. 250V DC                                                                     |                                                                                     |
|                              | Voltage proof              | 250V AC for 1minute                                                                                                                  |                                                                                   |                                                                                   | 500V AC<br>for 1minute                                                             | 300V AC for 1minute                                                                    |                                                                                     |
|                              | Center-taps                | Without                                                                                                                              |                                                                                   |                                                                                   | Without / With                                                                     | Without                                                                                | Without / With<br>(Volume control)                                                  |
| Mechanical performance       | Detent                     | Without, Center                                                                                                                      |                                                                                   | Without                                                                           | Without, Center                                                                    | Without                                                                                | Without, Center                                                                     |
|                              | Stopper strength           | 0.3N·m                                                                                                                               |                                                                                   | —                                                                                 | Without bushing 0.5N·m<br>With bushing 0.6N·m                                      | 0.5N·m                                                                                 | 0.6N·m                                                                              |
|                              | Push-pull strength         | 50N max.                                                                                                                             |                                                                                   | 30N max.                                                                          | 80N max.                                                                           |                                                                                        |                                                                                     |
|                              | Vibration                  | 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 |                                                                                   |                                                                                   |                                                                                    |                                                                                        |                                                                                     |
| Shaft configuration          |                            | Flat type, Knob type,<br>Screwdriver type                                                                                            |                                                                                   | Flat type                                                                         |                                                                                    |                                                                                        |                                                                                     |
| Terminal style               |                            | Insertion                                                                                                                            |                                                                                   |                                                                                   |                                                                                    |                                                                                        |                                                                                     |
| Page                         |                            | 345<br>364(RK09D117)                                                                                                                 |                                                                                   | 352                                                                               | 353                                                                                | 357<br>364(RK12L12H,<br>RK12L127)                                                      | 360                                                                                 |

|                                                     |     |
|-----------------------------------------------------|-----|
| Insulated Shaft Potentiometers Soldering Conditions | 366 |
| Potentiometers Cautions                             | 418 |
| Potentiometers Measurement and Test Methods         | 420 |
| Potentiometers Resistance Taper                     | 422 |

### Note

● Indicates applicability to all products in the series.

## ■ Reference for Manual Soldering

| Series                                             | Tip temperature | Soldering time | No. of solders |
|----------------------------------------------------|-----------------|----------------|----------------|
| <b>RK09D, RK09K, RK09Y11L, RK11K, RK12L, RK14K</b> | 350°C max.      | 3s max.        | 1 time         |

## ■ Reference for Dip Soldering

| Series       | Preheating                    |              | Dip soldering         |                | No. of solders |
|--------------|-------------------------------|--------------|-----------------------|----------------|----------------|
|              | Soldering surface temperature | Heating time | Soldering temperature | Soldering time |                |
| <b>RK12L</b> | 100°C                         | 1 min. max.  | 260°C max.            | 5s max.        | 2 time max.    |