

# Insulated Shaft Potentiometer 12mm Size Insulated Shaft Snap-in Type

RK12L Series



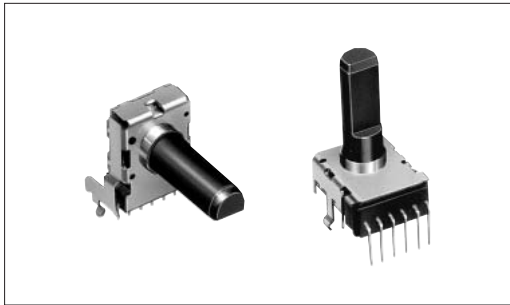
Full-fledged, high performance 12 mm type.

Rotary Potentiometers

Slide Potentiometers

Multi Control Devices

Rotary Sensors  
Linear Sensors



## Features

- Enhanced structural design has improved cross talk and gang error characteristics.
- R-shaped shaft end point prevents catching when inserting the knob.
- Solder bridges can hardly appear thanks to terminal configuration.

## Applications

- Sound volume, tone and balance controls for audio devices, including
- Controls for audio mixes, musical instruments and image devices including DVD players

Metal Shaft

Insulated Shaft

Knob Operating

## Typical Specifications

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

## Recommended Products List

| Number of resistor elements | Mounting direction | Products No. | Shaft type | Length of the shaft LM <sub>1</sub> (mm) | Center detent | Total resistance (kΩ) | Resistance taper | Application | Minimum packing unit (pcs.) | Drawing No. |
|-----------------------------|--------------------|--------------|------------|--|---------------|-----------------------|------------------|-------------|-----------------------------|-------------|
| Dual-unit                   | Vertical type      | RK12L1230C0K | Flat       | 20                                       | Without       | 50                    | 1B               | For tone    | 100                         | 2           |
|                             |                    | RK12L1230C0T |            | 30                                       |               | 10                    | 15A              |             |                             |             |
|                             |                    | RK12L1230C1M |            | 25                                       | With          | 20                    | 1B               |             |                             |             |
|                             |                    | RK12L123000E |            | 30                                       |               | 50                    |                  |             |                             |             |
|                             | Horizontal type    | RK12L1210C0R |            | 30                                       | Without       | 10                    | 15A              | For vol.    | 1                           |             |
|                             | Vertical type      | RK12L12C0C0V |            | 15                                       |               | 50                    | 15C              |             |                             |             |
|                             |                    | RK12L12C0A0E |            | 25                                       |               | 10                    | 15A              | 2           |                             |             |
|                             |                    | RK12L12C0A0G |            | 30                                       |               | 20                    |                  |             |                             |             |
|                             |                    | RK12L12C0A0A |            |  |               | 10                    |                  |             |                             |             |
|                             | Horizontal type    | RK12L12A0C0R |            | 30                                       |               | 10                    | 1                |             |                             |             |

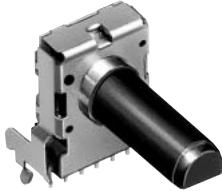
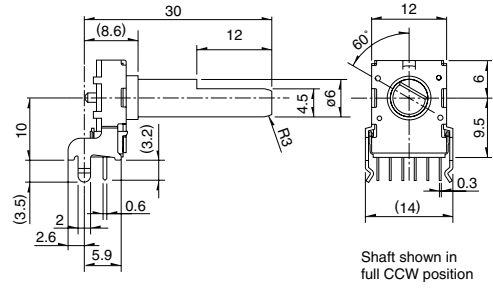
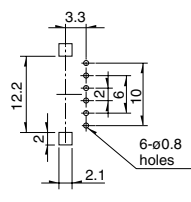

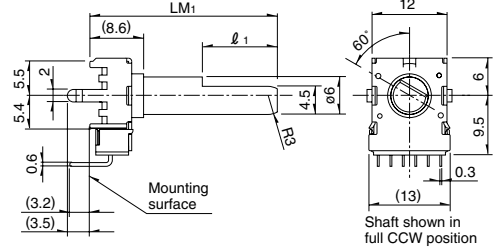
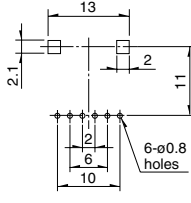
## Note

Additional product specifications in response to those not included in the above recommended products are also available.

For product varieties, see P.69  
For products specifications, see P.72

**Dimensions**

Unit:mm

| No.             | Photo  | Style   | PC board mounting hole dimensions (View from mounting side)                         |    |    |    |    |                |     |   |    |    |   |
|-----------------|--|---|---|----|----|----|----|----------------|-----|---|----|----|---|
| 1               | <p>Horizontal type without bushing<br/>RK12L121 (For tone control)<br/>RK12L12A (For vol. control)</p>  |  <p>Shaft shown in full CCW position</p>  |  |    |    |    |    |                |     |   |    |    |   |
| 2               | <p>Vertical type without bushing<br/>RK12L123 (For tone control)<br/>RK12L12C (For vol. control)</p>    | <table border="1" data-bbox="638 645 893 705"> <tr> <td>LM<sub>1</sub></td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> </tr> <tr> <td>ℓ<sub>1</sub></td> <td>4.5</td> <td>7</td> <td>12</td> <td>12</td> </tr> </table>  <p>Shaft shown in full CCW position</p> | LM <sub>1</sub>   | 15 | 20 | 25 | 30 | ℓ <sub>1</sub> | 4.5 | 7 | 12 | 12 |  |
| LM <sub>1</sub> | 15   | 20  | 25  | 30 |    |    |    |                |     |   |    |    |   |
| ℓ <sub>1</sub>  | 4.5  | 7   | 12  | 12 |    |    |    |                |     |   |    |    |   |

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**Product Varieties**

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

**Total Resistance Variety**

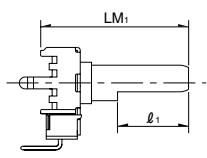
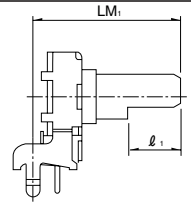
|                       |   |    |    |    |     |     |
|-----------------------|---|----|----|----|-----|-----|
| Total resistance (kΩ) | 5 | 10 | 20 | 50 | 100 | 200 |
|-----------------------|---|----|----|----|-----|-----|

**Resistance Taper**

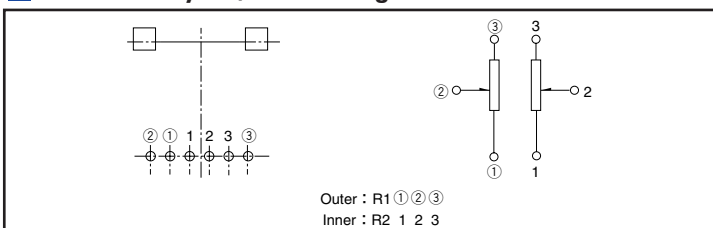
|                  |     |    |    |     |
|------------------|-----|----|----|-----|
| Resistance taper | 15A | 1B | 3B | 15C |
|------------------|-----|----|----|-----|

**Shaft Variety**

Unit:mm

| Style         | Vertical type   |   |    | Horizontal type |    |
|---------------|---|---|----|-----------------|----|
|               |  |  |    |                 |    |
| Shaft variety | LM <sub>1</sub>   | 15  | 20 | 25              | 30 |
|               | ℓ <sub>1</sub>  | 4.5   | 7  | 12              | 12 |

**Terminal Layout/Circuit Diagram**



**Note**

Shows the specification recommended by us.

For other resistance taper, see P.70, 199

# Orders Other Than Recommended Products

Specify orders for varieties that are not listed in the Recommended Product List, referring to the following example.

## Sample Part Number



### Model type

| Code | Model type               |
|------|--------------------------|
| 1    | Horizontal type for tone |
| 3    | Vertical type for tone   |
| A    | Horizontal type for vol. |
| C    | Vertical type for vol.   |

### 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                  |

### Detent

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

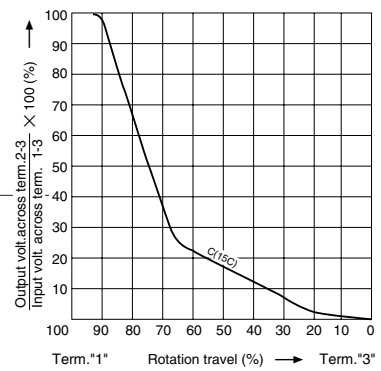
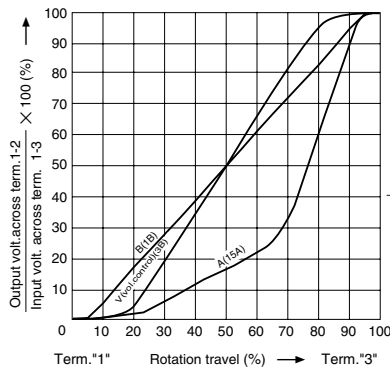
### Resistance taper

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



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## Products Specifications

| Items                              |                                   | Type                      | 9mm Size Insulated Shaft Snap-in   |                  | 9mm Size Insulated shaft Long-life  | 11mm Size Insulated Shaft Snap-in                   | 12mm/14mm Size Insulated Shaft Snap-in |  |
|------------------------------------|-----------------------------------|---------------------------|--|------------------|---|---|--|--|
|                                    |                                   | Model                     | RK09K11□<br>RK09D11□   | RK09K12□         | RK09Y11L  | RK11K11□  | RK12L12□<br>RK14K12□                   |  |
| Items                              |                                   |                           | Single-unit  | Dual-unit        | Single-unit   | Single-unit   | Dual-unit                              |  |
| <b>Operating temperature range</b> |                                   | -10°C to +70°C            |  |                  |   |   |  |  |
| <b>Electrical performance</b>      | <b>Total resistance tolerance</b> | ±20%                      | ±30%   |                  |   | ±20%  |  |  |
|                                    | <b>Rated power</b>                | 0.05W                     | 0.03W  | 0.01W            | 0.05W   |   |  |  |
|                                    | <b>Maximum operating voltage</b>  | 50V AC<br>20V DC          | 50V AC<br>For AC only  | 50VDL            | 50V AC<br>20V DC  | 50V AC<br>For AC only                               |  |  |
|                                    | <b>Insulation resistance</b>      | 100MΩ min.<br>250V DC     |  |                  |   | 100MΩ min.<br>500V DC                               | 100MΩ min.<br>250V DC                  |  |
|                                    | <b>Voltage proof</b>              | 1 minute 250V AC          |  |                  |   | 1 minute 500V AC                                    | 1 minute 300V AC                       |  |
|                                    | <b>Gang error</b>                 | —                         | -40dB to 0dB<br>within 3dB   | —                | Volume control<br>-40dB to 0dB max. 3dB<br>For tone control<br>within 2dB at center |   |  |  |
| <b>Mechanical performance</b>      | <b>Total rotational angle</b>     |                           | 280±5° RK09D11□ : 300±5°   |                  | 300±5°  |   |  |  |
|                                    | <b>Rotational torque</b>          |                           | 1 to 8mN·m   |                  | 5mN·m max   | 3 to 20mN·m   |  |  |
|                                    | Strength of the operating section | <b>Stopper strength</b>   | 0.3N·m   |                  | 150mN·m   | Without bushing<br>0.5N·m<br>With bushing<br>0.6N·m | 14mm 0.6N·m<br>12mm 0.5N·m             |  |
|                                    |                                   | <b>Push-pull strength</b> | 50N max.   |                  | 30N max.  | 80N 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 |                  |   |   |  |  |
|                                    | Solder heat resistance            | Manual soldering          | 350°C max. 3s max.   |                  |   |   |  |  |
| <b>Endurance</b>                   | <b>Operating life</b>             | 5,000 cycles              |  | 1,000,000 cycles | 15,000 cycles   |   |  |  |
| <b>Environmental test</b>          | <b>Cold</b>                       | -10°C for 96h             |  |                  |   |   |  |  |

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