

# 16mm Size Metal Shaft Potentiometer

RK163 Series

Versatile product lineups applicable for various controls.

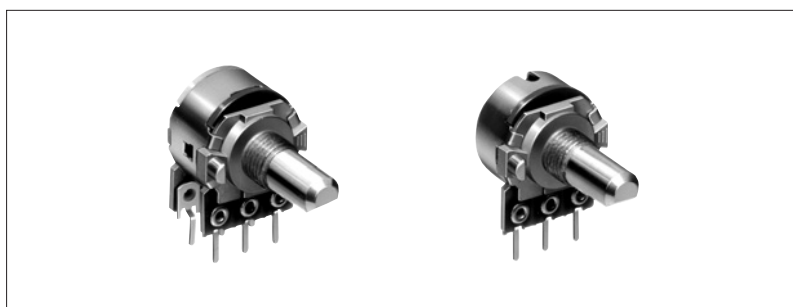
Rotary Potentiometers

Slide Potentiometers

Trimmer Potentiometers

Multi Control Devices

Position Sensors



Metal Shaft

Insulated Shaft

Knob Operating

## Applications

- Controls for sound devices, including mini component stereos and stereo systems
- Controls for refrigerators, fan heaters, wireless radios and measuring appliances

## Typical Specifications

| Items                       | Specifications |
|-----------------------------|----------------|
| Total resistance tolerance  | ±20%           |
| Maximum operating voltage   | 150V AC        |
| Total rotational angle      | 300±5°         |
| Rotational torque           | 2 to 25 mN·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      | Terminal style | Length of the shaft (mm) | Center detent | Total resistance (kΩ) | Resistance taper | Minimum packing unit (pcs.) | Drawing No. |      |    |
|-----------------------------|--------------------|--------------------|-----------------|----------------|--------------------------|---------------|-----------------------|------------------|-----------------------------|-------------|------|----|
| Single-unit                 | Horizontal type    | RK1631110TBK       | Flat            | For PC board   | 15                       | Without       | 10                    | 1B               | 100                         | 1           |      |    |
|                             |                    | RK1631110TT3       |                 |                | 20                       |               |                       | 15A              |                             |             |      |    |
|                             |                    | RK1631110U1Q       |                 | Lead           |                          |               |                       | 15               |                             |             | 20   | 3  |
|                             |                    | RK1631110TNP       | Knurled         | For PC board   | 15                       |               | 10                    |                  |                             |             | 4    |    |
|                             |                    | RK1631110U0Q       |                 |                |                          |               | Lead                  |                  |                             |             | 20   | 5  |
|                             |                    | Dual-unit for tone | Horizontal type | RK1631210ATD   | Flat                     |               | For PC board          | 20               |                             |             | With | 20 |
| RK16312101B8                | Knurled            |                    |                 | 15             | 6                        |               |                       |                  |                             |             |      |    |
| Dual-unit for vol.          | Horizontal type    | RK1631210AX9       | Knurled         | For PC board   | 15                       | Without       | 10                    | 15A              | 100                         | 5           |      |    |
|                             |                    | RK16312A0B85       | Flat            |                | 20                       |               |                       |                  |                             |             | 50   | 3B |
|                             |                    | RK16312A0BKH       |                 |                | 25                       |               |                       |                  |                             |             |      |    |
|                             |                    | RK16312A0BKR       | Knurled         |                | 15                       |               | 10                    | 15A              |                             | 6           |      |    |

## Note

Additional product specifications in response to those not included in the above recommended products are also available. For inquiries, contact our sales department.

For product specifications, see P.33  
For other detailed specifications, see P.48, 49

## Product Varieties

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

### Product Specifications and Applications

| Type                      | Model   | Applications                       | Detent variety       |
|---------------------------|---------|------------------------------------|----------------------|
| Single-shaft, single-unit | RK16311 | General                            | Center               |
| Single-shaft, dual-unit   | RK16312 | General or Volume and tone control | 11<br>21<br>31<br>41 |

### Total Resistance Variety

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

### Resistance Taper

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

### Dimensions of Shaft

#### 1) 18 teeth knurl

Unit:mm

**Die-casting shaft**

**Detail dimensions**

| L <sub>1</sub> | L <sub>B</sub> | l <sub>1</sub> |
|----------------|----------------|----------------|
| 15             | 5              | 8              |
| 20             | 5              | 12             |
| 25             | 7              | 12             |
| 30             | 7              | 12             |

Shaft shown in full CCW position

● The serration angle shall be as shown.

#### 2) Flat type

Unit:mm

**Detail dimensions**

| L <sub>1</sub> | L <sub>B</sub> | l <sub>1</sub> |
|----------------|----------------|----------------|
| 15             | 5              | 7              |
| 20             | 7              | 12             |
| 25             | 7              | 12             |
| 30             | 7              | 12             |

Shaft shown in full CCW position

#### 3) Slotted type

Unit:mm

**Detail dimensions**

| L <sub>1</sub> | L <sub>B</sub> |
|----------------|----------------|
| 15             | 7              |
| 20             | 7              |
| 25             | 7              |
| 30             | 7              |

Shaft shown in full CCW position

For resistance taper, see P.34, 224  
For attached parts, see P.50

## 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         |
|------|--------------------|
| 111  | Single-unit        |
| 121  | Dual-unit for tone |
| 12A  | Dual-unit for vol. |

#### Shaft type

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

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

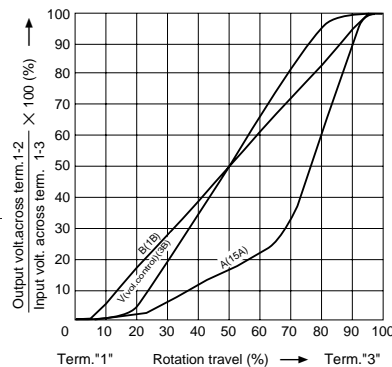
| Code | Length of the shaft | Code | Length of the shaft |
|------|---------------------|------|---------------------|
| 15   | 15                  | 25   | 25                  |
| 20   | 20                  | 30   | 30                  |

#### Detent

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

#### Resistance taper

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



#### Total resistance

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

#### Terminal style

| Code | Terminal style |
|------|----------------|
| P    | For PC board   |
| L    | Lead terminal  |

#### Note

Shows the specification recommended by us.

Rotary Potentiometers

Slide Potentiometers

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Multi Control Devices

Position Sensors


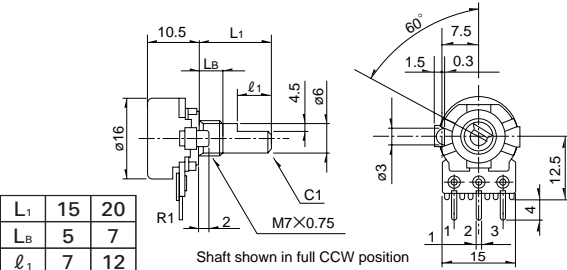
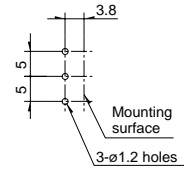
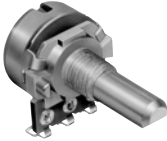
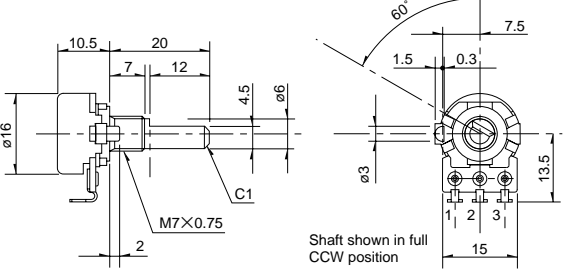
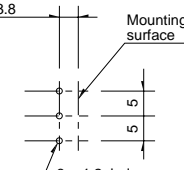
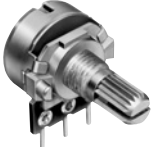
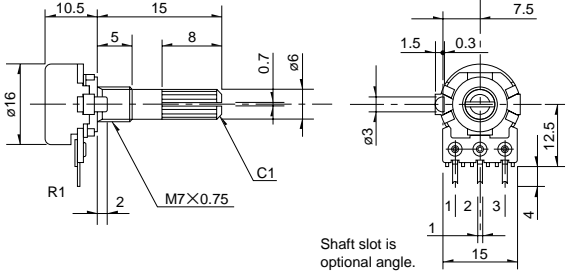
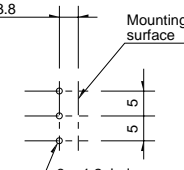

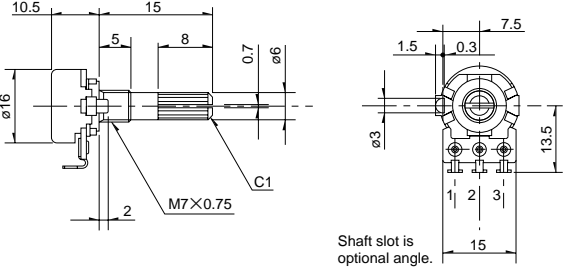
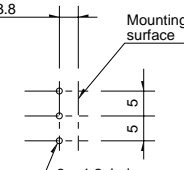
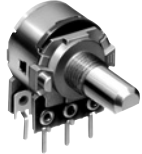
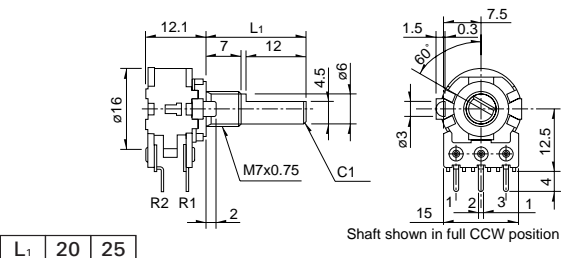
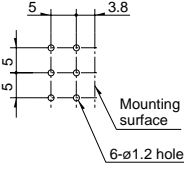
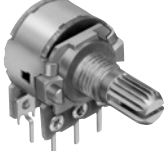
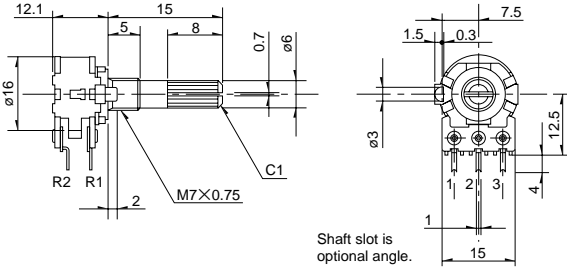
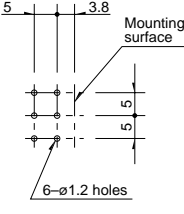
Metal Shaft

Insulated Shaft

Knob Operating

Dimensions

Unit:mm

| No.            | Model  | Style   | PC board mounting hole dimensions<br>(Viewed from mounting side)                      |    |    |   |   |   |                |   |    |   |
|----------------|--|---|---|----|----|---|---|---|----------------|---|----|---|
| 1              | Single-shaft, single-unit<br>RK163111<br>                                     |  <table border="1" data-bbox="592 517 727 595"> <tr> <td>L<sub>1</sub></td> <td>15</td> <td>20</td> </tr> <tr> <td>L<sub>B</sub></td> <td>5</td> <td>7</td> </tr> <tr> <td>l<sub>1</sub></td> <td>7</td> <td>12</td> </tr> </table> | L <sub>1</sub>  | 15 | 20 | L <sub>B</sub>  | 5 | 7 | l <sub>1</sub> | 7 | 12 |  |
| L <sub>1</sub> | 15   | 20  |   |    |    |   |   |   |                |   |    |   |
| L <sub>B</sub> | 5  | 7   |   |    |    |   |   |   |                |   |    |   |
| l <sub>1</sub> | 7  | 12  |   |    |    |   |   |   |                |   |    |   |
| 2              | Single-shaft, single-unit<br>RK163111<br>                                     |   |   |    |    |   |   |   |                |   |    |   |
| 3              | Single-shaft, single-unit<br>RK163111<br>                                    |    |   |    |    |   |   |   |                |   |    |   |
| 4              | Single-shaft, single-unit<br>RK163111<br>                                   |   |   |    |    |   |   |   |                |   |    |   |
| 5              | Single-shaft, dual-unit<br>RK163121 (For tone)<br>RK16312A (For volume)<br> |  <table border="1" data-bbox="592 1720 727 1749"> <tr> <td>L<sub>1</sub></td> <td>20</td> <td>25</td> </tr> </table>  | L <sub>1</sub>  | 20 | 25 |  |   |   |                |   |    |   |
| L <sub>1</sub> | 20   | 25  |   |    |    |   |   |   |                |   |    |   |
| 6              | Single-shaft, dual-unit<br>RK163121 (For tone)<br>RK16312A (For volume)<br> |   |  |    |    |   |   |   |                |   |    |   |

Rotary Potentiometers

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## Products Varieties

| Items                              |   | Model  |                    | RK097<br>RK098  | RK117                            | RK163<br>RK168 |
|------------------------------------|---|--|--------------------|---|----------------------------------|----------------|
|                                    |   | RK09L  |                    |   |                                  |                |
| <b>Operating temperature range</b> |   | -10°C to +70°C   |                    |   |                                  |                |
| <b>Electrical performance</b>      | <b>Total resistance tolerance</b>             | ±20%   |                    |   |                                  |                |
|                                    | <b>Rated power</b>                            | 0.05W  |                    |   |                                  |                |
|                                    | <b>Maximum operating voltage</b>              | 50V AC   |                    |   | RK163 :150V AC<br>RK168 : 50V AC |                |
|                                    | <b>Residual resistance</b>                    | $R \leq 10k\Omega$ 20Ω max.<br>$10k\Omega < R \leq 50k\Omega$ 30Ω max.<br>$50k\Omega < R$ Nominal total resistance of 0.1% or less                                 |                    |   |                                  |                |
|                                    | <b>Maximum attenuation (Volume control)</b>   | $5k\Omega \leq R < 10k\Omega$ 70dB min.<br>$10k\Omega \leq R < 50k\Omega$ 80dB min.<br>$50k\Omega \leq R < 100k\Omega$ 90dB min.<br>$100k\Omega \leq R$ 100dB min. |                    |   |                                  |                |
|                                    | <b>Insulation resistance</b>                  | 100MΩ min. 250V DC   |                    |   | 100MΩ min.<br>500V DC            |                |
|                                    | <b>Voltage proof</b>                          | 1 minute 300V AC   |                    |   | 1 minute 500V AC                 |                |
|                                    | <b>Mechanical performance</b>                 | <b>Total rotational angle</b>  | 300±5°             | 300±5°<br>(Shaft movement type is 300 <sup>+10°</sup> ) | 300 <sup>+10°</sup>              | 300±5°         |
| <b>Rotational torque</b>           |   | 2 to 25mN·m  |                    |   | RK168 : 15 to 45mN·m             |                |
| <b>Stopper strength</b>            |   | 0.5N·m (For shaft movable type,0.4N·m)   |                    |   | 0.9N·m                           |                |
| <b>Push-pull strength</b>          |   | 80N max.   | 100N 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             |   | <b>Manual soldering</b>  | 350°C max. 3s max. |   |                                  |                |
|                                    | <b>Dip soldering (Dip available products)</b> | 260±5°C 4±1s   |                    |   | —                                |                |
| <b>Endurance</b>                   | <b>Operating life</b>                         | 15,000 cycles  |                    |   |                                  |                |
| <b>Environmental test</b>          | <b>Cold</b>                                   | -10°C for 96h  |                    |   |                                  |                |
|                                    | <b>Long-term heat resistance</b>              | +70°C for 96h  |                    |   |                                  |                |
|                                    | <b>Moisture resistance</b>                    | +40±2°C, 90 to 95%RH for 96h   |                    |   |                                  |                |

Rotary Potentiometers

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Knob Operating

## Attached Parts

These parts are attached to the following products.

Unit:mm

| Applicable products                          | Bearing screw diameter | Hexagonal nut | Flat washer |
|--|------------------------|---------------|-------------|
| <b>RK09L</b><br><b>RK168</b><br><b>RK097</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                     |               |             |

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