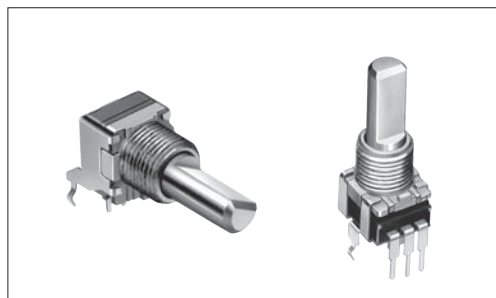


RK09L 9mm Size Metal Shaft Snap-in Type

Single-unit and dual-unit types suit a variety of controls



Typical Specifications

| Items | Specifications |
|-----------------------------|----------------|
| Total resistance tolerance | ±20% |
| Maximum operating voltage | 50V AC, 10V DC |
| Total rotational angle | 300° ±5° |
| Rotational torque | 2 to 25mN·m |
| Operating life | 15,000 cycles |
| Operating temperature range | -10°C to +70°C |

Product Line

| Number of resistor elements | Mounting direction | Shaft type | Length of the shaft L ₁ (mm) | Center detent | Total resistance (kΩ) | Resistance taper | Minimum order unit (pcs.) | | Products No. | Drawing No. | |
|-----------------------------|--------------------|------------|---|---------------|-----------------------|---------------------|---------------------------|---------------------|---------------------|---------------------|---------------------|
| | | | | | | | Japan | Export | | | |
| Single-unit | Horizontal type | Flat | 15 | Without | 10 | 15A | 1,000 | 2,000 | RK09L1120A2S | 1 | |
| | | | | With | 20 | 1B | | | RK09L112003P | | |
| | 12.5 | | Without | 10 | 15A | RK09L1120A69 | | | 2 | | |
| | | | | 50 | 1B | RK09L1140A5E | | | | | |
| | 15 | | With | 10 | 1B | RK09L1140A66 | | | | | |
| | 20 | | | 10 | 1B | RK09L1140A5P | | | | | |
| | 25 | | Without | 5 | 1B | RK09L114001T | | | | | |
| | Dual-unit | | Horizontal type for tone | 15 | With | 50 | | | | 1B | RK09L1140A65 |
| | | | Horizontal type for vol. | | Without | 100 | | | 15A | RK09L122002M | |
| | | | Vertical type for tone | 25 | Without | 50 | | | 15A | RK09L1220A1B | |
| 15 | | With | | 50 | 1B | RK09L12B0A31 | | | | | |
| Vertical type for vol. | | 20 | Without | 10 | 15A | RK09L12B0A3Z | 4 | | | | |
| | | 15 | | | | RK09L124000Z | | | | | |
| | | 20 | | | | RK09L1240A12 | | | | | |
| | | 15 | | | | RK09L12D0A1W | | | | | |
| | | | | | | | | RK09L12D0A1T | | | |

Note

Other varieties are also available. Refer to "Other Specifications" (P.315).

Packing Specifications

Tray

| Number of packages (pcs.) | | Export package measurements (mm) |
|---------------------------|------------------------|----------------------------------|
| 1 case /Japan | 1 case /export packing | |
| 1,000 | 2,000 | 364×473×176 |

Refer to P.315 for other specifications.
 Refer to P.315 for attached parts.
 Refer to P.316 for ordering products not listed.
 Refer to P.349 for soldering conditions.

RK09L 9mm Size Metal Shaft Snap-in Type

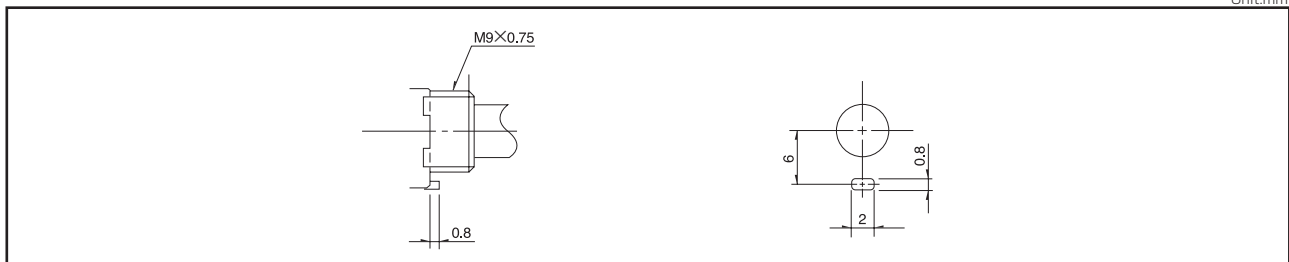
Dimensions

Unit:mm

| No. | Photo | Style | PC board mounting hole dimensions (Viewed from mounting side) | | | | | | | | | | | | | | | |
|----------------|---|---|--|------|----|----------------|----|----------------|----------------|---|----|---|----------------|---|---|----|----|--|
| 1 | <p>Single-shaft, single-unit Horizontal type RK09L1120</p> | <table border="1"> <tr> <td>L₁</td> <td>15</td> <td>20</td> </tr> <tr> <td>L_B</td> <td>5</td> <td>7</td> </tr> <tr> <td>l₁</td> <td>7</td> <td>12</td> </tr> </table> | L ₁ | 15 | 20 | L _B | 5 | 7 | l ₁ | 7 | 12 | | | | | | | |
| L ₁ | 15 | 20 | | | | | | | | | | | | | | | | |
| L _B | 5 | 7 | | | | | | | | | | | | | | | | |
| l ₁ | 7 | 12 | | | | | | | | | | | | | | | | |
| 2 | <p>Single-shaft, single-unit Vertical type RK09L1140</p> | <table border="1"> <tr> <td>L₁</td> <td>12.5</td> <td>15</td> <td>20</td> <td>25</td> </tr> <tr> <td>L_B</td> <td>5</td> <td>5</td> <td>7</td> <td>7</td> </tr> <tr> <td>l₁</td> <td>7</td> <td>7</td> <td>12</td> <td>12</td> </tr> </table> | L ₁ | 12.5 | 15 | 20 | 25 | L _B | 5 | 5 | 7 | 7 | l ₁ | 7 | 7 | 12 | 12 | |
| L ₁ | 12.5 | 15 | 20 | 25 | | | | | | | | | | | | | | |
| L _B | 5 | 5 | 7 | 7 | | | | | | | | | | | | | | |
| l ₁ | 7 | 7 | 12 | 12 | | | | | | | | | | | | | | |
| 3 | <p>Single-shaft, dual-unit Horizontal type RK09L1220 (For tone) RK09L12B0 (For vol.)</p> | <table border="1"> <tr> <td>L₁</td> <td>15</td> <td>25</td> </tr> <tr> <td>L_B</td> <td>5</td> <td>7</td> </tr> <tr> <td>l₁</td> <td>7</td> <td>12</td> </tr> </table> | L ₁ | 15 | 25 | L _B | 5 | 7 | l ₁ | 7 | 12 | | | | | | | |
| L ₁ | 15 | 25 | | | | | | | | | | | | | | | | |
| L _B | 5 | 7 | | | | | | | | | | | | | | | | |
| l ₁ | 7 | 12 | | | | | | | | | | | | | | | | |
| 4 | <p>Single-shaft, dual-unit Vertical type RK09L1240 (For tone) RK09L12D0 (For vol.)</p> | <table border="1"> <tr> <td>L₁</td> <td>15</td> <td>20</td> </tr> <tr> <td>L_B</td> <td>5</td> <td>7</td> </tr> <tr> <td>l₁</td> <td>7</td> <td>12</td> </tr> </table> | L ₁ | 15 | 20 | L _B | 5 | 7 | l ₁ | 7 | 12 | | | | | | | |
| L ₁ | 15 | 20 | | | | | | | | | | | | | | | | |
| L _B | 5 | 7 | | | | | | | | | | | | | | | | |
| l ₁ | 7 | 12 | | | | | | | | | | | | | | | | |

Dimensions of Bushing and Fixing Lug

Unit:mm



9mm Size Metal Shaft Snap-in Type / Other Specifications

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

Total Resistance Variety

| | | | | | |
|--------------------------------|---|----|----|----|-----|
| Total resistance (k Ω) | 5 | 10 | 20 | 50 | 100 |
|--------------------------------|---|----|----|----|-----|

Resistance Taper

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

Shaft Variety

Unit:mm

Shaft shown in full CCW position

Detail dimensions

| L ₁ | L _B | l ₁ |
|----------------|----------------|----------------|
| 12.5 | 5 | 7 |
| 15 | 5 | 7 |
| 17.5 | 5 | 7 |
| 20 | 7 | 12 |
| 25 | 7 | 12 |

Note

Marked are specifications recommended by Alps.

9mm Size Metal Shaft Snap-in Type / Attached Parts

The following parts are included with the product.

Unit:mm

| Nut | Washer |
|----------------|--------|
| <p>M9x0.75</p> | |

9mm Size Metal 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 0 9 L 1 1 4 0 — **F 1 5** — **C 0** — **B 1 0 3**

Model type

| Code | Model type |
|------|------------------------------------|
| 112 | Single-unit horizontal type |
| 114 | Single-unit vertical type |
| 122 | Dual-unit horizontal type for tone |
| 124 | Dual-unit vertical type for tone |
| 12B | Dual-unit horizontal type for vol. |
| 12D | Dual-unit vertical type for vol. |

Shaft type

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

* Only available in flat format.

Length of the shaft L₁ (mm)

| Code | Length of the shaft | Code | Length of the shaft | Code | Length of the shaft |
|------|---------------------|------|---------------------|------|---------------------|
| 12 | 12.5 | 17 | 17.5 | 25 | 25 |
| 15 | 15 | 20 | 20 | — | — |

Detent

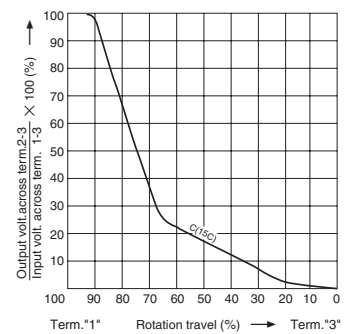
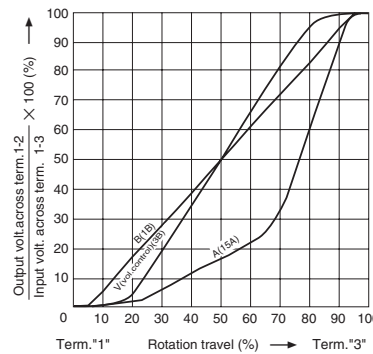
| Code | Center detent |
|------|---------------|
| C0 | Without |
| C1 | With |

Resistance taper

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

B: For tone & general (model type : 112, 114, 122, 124)

V: For vol. (model type : 112, 114, 12B, 12D)



Total resistance

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











Note

Marked are specifications recommended by Alps.

Rotary Potentiometers
 Slide Potentiometers
 Metal Shaft
 Insulated Shaft
 Knob Operating
 Ring Type

Metal Shaft Potentiometers

List of Varieties

| Type | 9mm size | | | | 11mm size | |
|------------------------------|---|--|--|---|---|-------------------------------------|
| Series | RK09L | | RK0971 | RK0972 | RK119 | |
| | Single-shaft | | | Dual-shaft | Single-shaft | |
| Number of resistor elements | Single/dual | | | Dual | Single | |
| Photo |  |  |  |  |  | |
| Terminal mounting | Horizontal | Vertical | Horizontal | | Vertical | |
| Fixing method of bushing | Screw | | | | Guide | |
| Operating temperature range | -10°C to +70°C | | -20°C to +70°C -40°C to +85°C (Vehicle-compatible) | | -40°C to +85°C | |
| Operating life | 15,000 cycles | | | | | |
| Available for automotive use | — | — | ○ | ○ | ○ | |
| Life cycle (availability) |  |  |  |  |  | |
| Mechanical performance | Total resistance (kΩ) | 10, 20, 50, 100 | | | | 10 |
| | Resistance taper | 15A, 1B, 3B, 15C | | | | 1B |
| | Rated Power | 0.05W | | | | |
| | Residual resistance | $R \leq 10k\Omega$ 20Ω max. $10k\Omega < R < 50k\Omega$ 30Ω max. $50k\Omega \leq R$ Nominal total resistance of 0.1% or less | | | | $R \leq 10k\Omega$ 50Ω max. |
| | Maximum attenuation (Volume control) | $5k\Omega \leq R < 10k\Omega$ 70dB min. $10k\Omega \leq R < 50k\Omega$ 80dB min. $50k\Omega \leq R$ 90dB min. | $5k\Omega \leq R < 10k\Omega$ 70dB min. $10k\Omega \leq R < 50k\Omega$ 80dB min. $50k\Omega \leq R < 100k\Omega$ 90dB min. $100k\Omega \leq R$ 100dB min. | | — | |
| | Gang error applicable to Dual-unit parts for audio volume control purposes | -40dB to 0dB 3dB max. | | | | — |
| | Insulation resistance | 100MΩ min. 250V DC | | | | |
| | Voltage proof | 300V AC for 1minute | | | | 300V AC for 1 minute or 360V for 2s |
| | Center-taps | Without | | Without / With | | Without |
| Electrical performance | Detent | Without, Center | | Without, Center, 11, 31 | | Without |
| | Stopper strength | 0.5N·m | | 0.5N·m (With push-lock mechanism: 0.4N·m) | | 0.5N·m |
| | Push-pull strength | 80N max. | | 100N 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 style | Flat type | | | Inner-shaft: flat type Outer-shaft: slotted type | Flat type | |
| Terminal style | Insertion | | | | Reflow | |
| Attached switch | — | — | Rotary switch Push-on push-off switch Push-on switch | — | Push-on switch | |
| Page | 313 | | 317 | | 328 | |

| | |
|---|-----|
| Metal Shaft Potentiometers Soldering Conditions | 349 |
| Potentiometers Cautions | 427 |
| Potentiometers Measurement and Test Methods | 429 |
| Potentiometers Resistance Taper | 431 |

Notes

- For the switch attached, the single-shaft or inner shaft of the dual-shaft type can be chosen.
- The operating temperature range for automotive applications can be raised upon request. Please contact us for details.
- Indicates applicability to some products in the series.

Reference for Manual Soldering

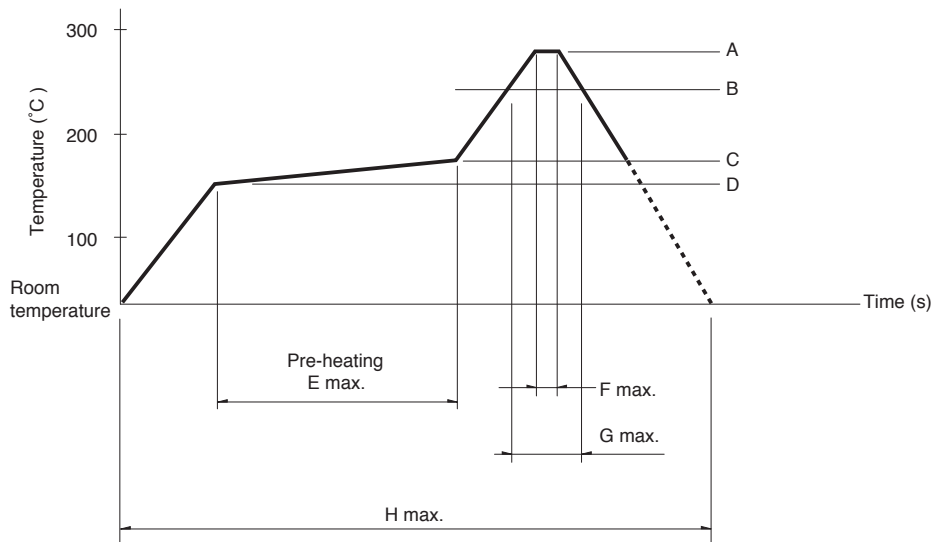
| Series | Tip temperature | Soldering time | No. of solders |
|---------------------|-------------------------------|--------------------------------|----------------|
| RK09L, RK097 | 350°C max. | 3s max. | 1 time |
| RK203 | 300°C max. | 3s max. | 1 time |
| RK119 | 350±10°C | 3 ⁺¹ ₀ s | 1 time |
| RK271 | 350°C max. | 5s max. | 1 time |
| RK501 | 350±10°C | 5 ⁺¹ ₀ s | 1 time |
| RK163 | 350°C max. | 5s max. | 1 time |
| RK168 | Potentiometer terminal | 300°C max. | 3s max. |
| | Motor terminal | 350°C max. | 2s max. |

Reference for Dip Soldering

| Series | Preheating | | Dip soldering | | No. of solders |
|----------------------------|-------------------------------|--------------|-----------------------|----------------|----------------|
| | Soldering surface temperature | Heating time | Soldering temperature | Soldering time | |
| RK09L, RK097, RK203 | 100°C max. | 2 min. max. | 260±5°C | 5±1s | 2 time max. |
| RK501 | 120±10°C | 2 min. max. | 260±5°C | 5±1s | 2 time |

Example of Reflow Soldering Condition

Temperature profile



| Series | A | B | C | D | E | F | G | H | No. of reflows |
|--------------|-------|-------|-------|-------|--------|----|-----|--------|----------------|
| RK119 | 260°C | 230°C | 180°C | 150°C | 2 min. | 3s | 40s | 4 min. | 2 time max. |

Notes

1. When using an infrared reflow oven, solder may sometimes not be applied. Be sure to use a hot air reflow oven or at type that uses infrared rays in combination with hot air.
2. The temperatures given above are the maximum temperatures at the terminals of the potentiometer when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the potentiometer may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the potentiometer does not rise to 250°C or greater.
3. Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.



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