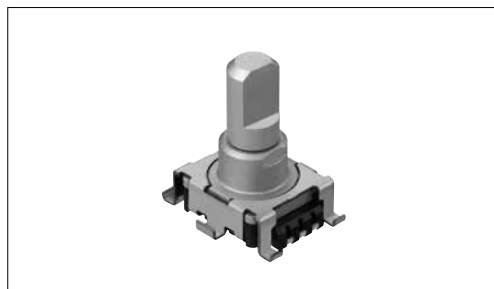


# RK119 1 1 mm Size Metal Shaft Reflow Type

1.5mm-travel push-on switch achieved in a low-profile height of only 5mm



## Typical Specifications

| Items                       | Specifications                                 |
|-----------------------------|------------------------------------------------|
| Total resistance tolerance  | ±20%                                           |
| Maximum operating voltage   | 10V DC                                         |
| Total rotational angle      | $300^{\circ} \pm \frac{10^{\circ}}{5^{\circ}}$ |
| Rotational torque           | $7.5 \pm 3.5 \text{ mN} \cdot \text{m}$        |
| Operating life              | 15,000 cycles                                  |
| Operating temperature range | -40°C to +85°C                                 |

## Product Line

| Number of resistor elements | Mounting direction | Shaft type | Length of the shaft L <sub>1</sub> (mm) | Detent  | Total resistance (kΩ) | Resistance taper | Switch travel (mm) | Minimum order unit (pcs.) |        | Products No.        | Drawing No. |
|-----------------------------|--------------------|------------|-----------------------------------------|---------|-----------------------|------------------|--------------------|---------------------------|--------|---------------------|-------------|
|                             |                    |            |                                         |         |                       |                  |                    | Japan                     | Export |                     |             |
| Single-unit                 | Vertical type      | Flat       | 15                                      | Without | 10                    | 1B               | Without            | 480                       | 480    | <b>RK1191110001</b> | 1           |
|                             |                    |            |                                         |         |                       |                  | 0.5                |                           |        | <b>RK1191114001</b> | 2           |
|                             |                    |            |                                         |         |                       |                  | 1.5                |                           |        | <b>RK1191124001</b> | 3           |

### Note

Other varieties are also available. Refer to "Other Specifications" (P.323).

## Packing Specifications

Tray

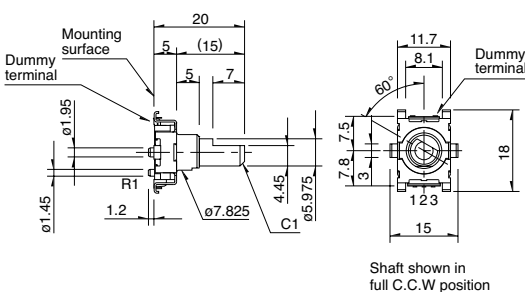
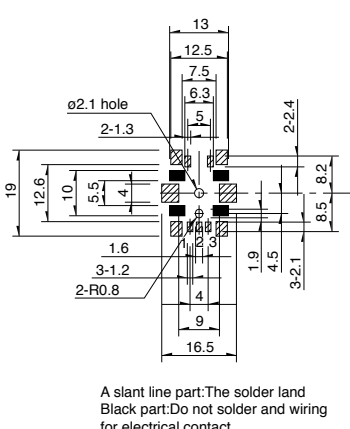
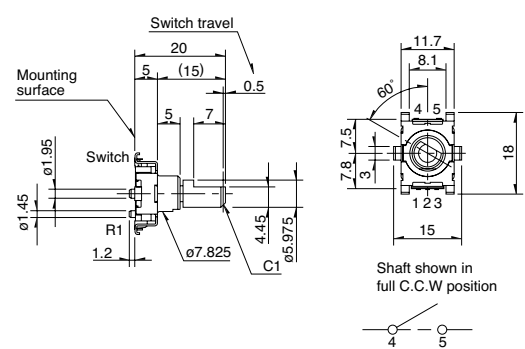
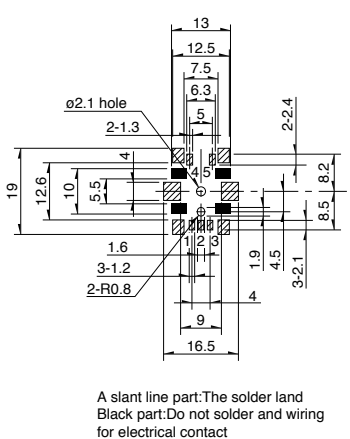
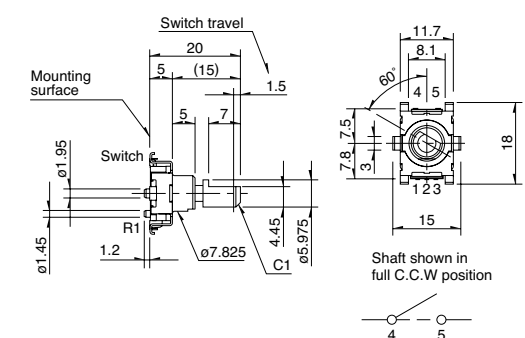
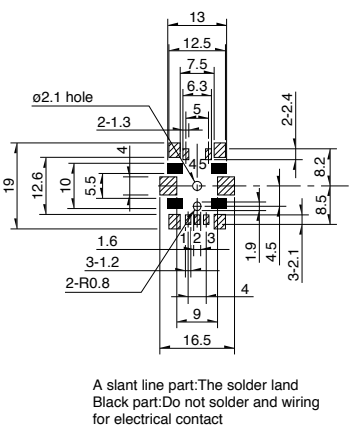
| Number of packages (pcs.) |                        | Export package measurements (mm) |
|---------------------------|------------------------|----------------------------------|
| 1 case /Japan             | 1 case /export packing |                                  |
| 480                       | 480                    | 300×240×270                      |

Refer to P.323 for other specifications.  
 Refer to P.323 for switch specifications.  
 Refer to P.324 for ordering products not listed.  
 Refer to P.343 for soldering conditions.

# RK119 1 1 mm Size Metal Shaft Reflow Type

## Dimensions

Unit:mm

| No. | Photo                                                                               | Style                                                                                                                          | PC board mounting hole dimensions<br>(Viewed from mounting side)                                                                                                                                |
|-----|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   |    |  <p>Shaft shown in full C.C.W position</p>   |  <p>A slant line part: The solder land<br/>Black part: Do not solder and wiring for electrical contact</p>   |
| 2   |   |  <p>Shaft shown in full C.C.W position</p>  |  <p>A slant line part: The solder land<br/>Black part: Do not solder and wiring for electrical contact</p>  |
| 3   |  |  <p>Shaft shown in full C.C.W position</p> |  <p>A slant line part: The solder land<br/>Black part: Do not solder and wiring for electrical contact</p> |

## 1 1 mm Size Metal Shaft Reflow Type / Other Specifications

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

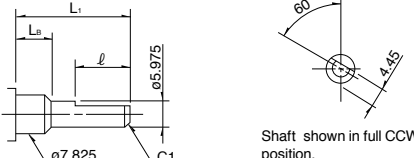
### ■ Detent and Attached Switch

| Varieties                 | Items | Detent  | Attached switches travel |       |
|---------------------------|-------|---------|--------------------------|-------|
| Single-shaft, Single-unit |       | Without | 0.5mm                    | 1.5mm |

### ■ Dimensions of Shaft

Flat type

Unit:mm

|                                                                                                                            |                        |          |                        |  |  |
|----------------------------------------------------------------------------------------------------------------------------|------------------------|----------|------------------------|--|--|
|  <p>Shaft shown in full CCW position.</p> |                        |          | Detail dimensions (mm) |  |  |
| <b>L<sub>1</sub></b>                                                                                                       | <b>※ L<sub>b</sub></b> | <b>l</b> |                        |  |  |
| (15)                                                                                                                       | 5                      | 7        |                        |  |  |
| (20)                                                                                                                       | 5                      | 10       |                        |  |  |

### Notes

- ※ L<sub>b</sub> does not support M7 (with screws).
- Marked are specifications recommended by Alps Alpine.

## 1 1 mm Size Metal Shaft Reflow Type / Switch Specifications

|                        |                       |                                                                 |         |
|------------------------|-----------------------|-----------------------------------------------------------------|---------|
| Switch type            |                       | Momentary push switch                                           |         |
| Contact arrangement    |                       | Single pole and single throw (Push-on)                          |         |
| Travel (mm)            |                       | 0.5±0.3                                                         | 1.5±0.5 |
| Operating force        |                       | 5±2N                                                            | 4±2N    |
| Operating life         |                       | 20,000 times                                                    |         |
| Electrical performance | Rating                | 0.1A 5V DC (0.1mA 5V DC min. ratings)                           |         |
|                        | Contact resistance    | 100mΩ max. for initial period, 200mΩ max. after operating life. |         |
|                        | Insulation resistance | 100MΩ max. 250V DC                                              |         |
|                        | Voltage proof         | 300V AC for 1 minute or 360V AC for 2 second                    |         |

# 1 1 mm Size Metal Shaft Reflow 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 9 1 1 1 0** — **F 1 5** — **C 0** — **B 1 0 3**

Switch Specification

| Code | Switch Specification                      |
|------|-------------------------------------------|
| 10   | Without switch                            |
| 14   | With momentary push switch (0.5mm travel) |
| 24   | With momentary push switch (1.5mm travel) |

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

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

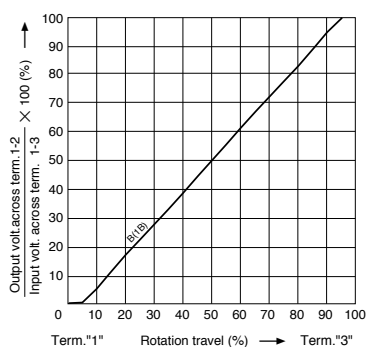
Detent

| Code | Detent  |
|------|---------|
| C0   | Without |

Resistance taper

| Code | Resistance taper |
|------|------------------|
| B    | 1B               |

B: For tone & general



Total resistance

| Code | Total resistance (kΩ) |
|------|-----------------------|
| 103  | 10                    |

Note

Marked are specifications recommended by Alps Alpine.

# 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℃ to +70℃                                                                                                                         |                                                                                                 | -20℃ to +70℃<br>-40℃ to + 85℃ (Vehicle-compatible)                                |                                                                                     | -40℃ to +85℃                                                                        |
| Operating life               |                                                                            | 15,000 cycles                                                                                                                        |                                                                                                 |                                                                                   |                                                                                     |                                                                                     |
| Available for automotive use |                                                                            | —                                                                                                                                    | —                                                                                               | ○                                                                                 | ○                                                                                   | ○                                                                                   |
| Life cycle (availability)    |                                                                            |                                                     |                |  |  |  |
| Electrical performance       | Total resistance (k Ω)                                                     | 10, 20, 50, 100                                                                                                                      |                                                                                                 |                                                                                   |                                                                                     | 10                                                                                  |
|                              | Resistance taper                                                           | 15A, 1B, 3B, 15C                                                                                                                     |                                                                                                 |                                                                                   |                                                                                     | 1B                                                                                  |
|                              | Rated Power                                                                | 0.05W                                                                                                                                |                                                                                                 |                                                                                   |                                                                                     |                                                                                     |
|                              | Residual resistance                                                        | R≤10kΩ 20Ω max.<br>10kΩ<R<50kΩ 30Ω max.<br>50kΩ≤R Nominal total resistance of 0.1% or less                                           |                                                                                                 |                                                                                   |                                                                                     | R≤10kΩ 50Ω max.                                                                     |
|                              | Maximum attenuation (Volume control)                                       | 5kΩ≤R< 10kΩ 70dB min.<br>10kΩ≤R< 50kΩ 80dB min.<br>50kΩ≤R 90dB min.                                                                  | 5kΩ≤R< 10kΩ 70dB min.<br>10kΩ≤R< 50kΩ 80dB min.<br>50kΩ≤R<100kΩ 90dB min.<br>100kΩ≤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                                                                             |
| Mechanical performance       | Detent                                                                     | Without, Center                                                                                                                      |                                                                                                 |                                                                                   |                                                                                     | 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<br>Outer-shaft: slotted type                                 | Flat type                                                                           |
| Terminal style               |                                                                            | Insertion                                                                                                                            |                                                                                                 |                                                                                   |                                                                                     | Reflow                                                                              |
| Attached switch              |                                                                            | —                                                                                                                                    | —                                                                                               | Rotary switch<br>Push-on push-off switch<br>Push-on switch<br>Push-lock switch    | —                                                                                   | Push-on switch                                                                      |
| Page                         |                                                                            | 306                                                                                                                                  |                                                                                                 | 310                                                                               |                                                                                     | 321                                                                                 |

|                                                 |     |
|-------------------------------------------------|-----|
| Metal Shaft Potentiometers Soldering Conditions | 343 |
| Potentiometers Cautions                         | 418 |
| Potentiometers Measurement and Test Methods     | 420 |
| Potentiometers Resistance Taper                 | 422 |

### Notes

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

## Reference for Manual Soldering

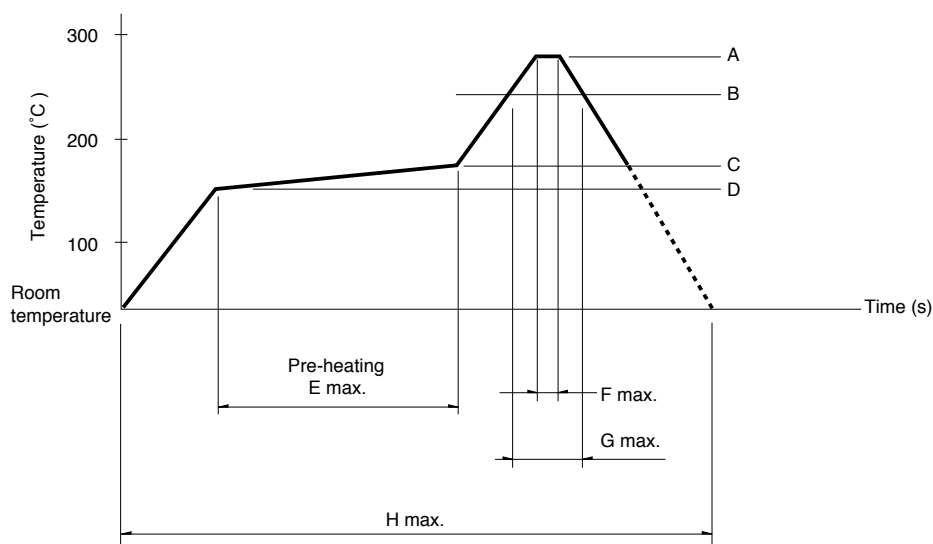
| Series              |                               | Tip temperature | Soldering time                                      | No. of solders |
|---------------------|-------------------------------|-----------------|-----------------------------------------------------|----------------|
| <b>RK09L, RK097</b> |                               | 350°C max.      | 3s max.                                             | 1 time         |
| <b>RK203</b>        |                               | 300°C max.      | 3s max.                                             | 1 time         |
| <b>RK119</b>        |                               | 350±10°C        | 3 $\begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ s | 1 time         |
| <b>RK271</b>        |                               | 350°C max.      | 5s max.                                             | 1 time         |
| <b>RK501</b>        |                               | 350±10°C        | 5 $\begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ s | 1 time         |
| <b>RK163</b>        |                               | 350°C max.      | 5s max.                                             | 1 time         |
| <b>RK168</b>        | <b>Potentiometer terminal</b> | 300°C max.      | 3s max.                                             | 1 time         |
|                     | <b>Motor terminal</b>         | 350°C max.      | 2s max.                                             | 1 time         |

## Reference for Dip Soldering

| Series                     | Preheating                    |              | Dip soldering         |                | No. of solders |
|----------------------------|-------------------------------|--------------|-----------------------|----------------|----------------|
|                            | Soldering surface temperature | Heating time | Soldering temperature | Soldering time |                |
| <b>RK09L, RK097, RK203</b> | 100°C max.                    | 2 min. max.  | 260±5°C               | 5±1s           | 2 time max.    |
| <b>RK501</b>               | 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 |
|--------------|-------|-------|-------|-------|--------|----|-----|--------|----------------|
| <b>RK119</b> | 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.