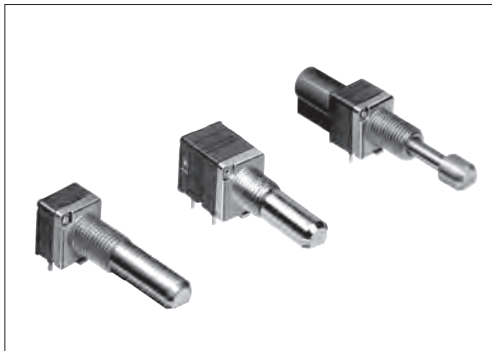


# RK097 9mm Size Metal Shaft Multi-ganged Type

9.5mm width potentiometer ideal for various types of control



## Typical Specifications



Items	Specifications
Total resistance tolerance	±20%
Maximum operating voltage	50V AC, 10V DC
Total rotational angle	300°±5° (For shaft movable type, 300°±10°)
Rotational torque	2 to 25mN·m
Operating life	15,000 cycles
Operating temperature range	-20°C to +70°C -40°C to +85°C (Vehicle-compatible)

## Product Line

### Single-shaft without switch type

Number of resistor elements	Shaft type	Length of the shaft L <sub>1</sub> (mm)	Center detent	Total resistance (kΩ)	Resistance taper	Minimum order unit (pcs.)		Products No.	Drawing No.
						Japan	Export		
Single-unit	Flat	20	Without	10	15A	1,200 (A type)	2,400 (A type)	<b>RK097111080R</b>	1
			With		1B				
Dual-unit for tone			With		1B	800 (B type)	1,600 (B type)	<b>RK0971210DBH</b>	2
Dual-unit for vol.			Without		15A	800 (B type)	1,600 (B type)	<b>RK09712200HA</b>	

### Single-shaft with rotary switch type

Number of resistor elements	Shaft type	Length of the shaft L <sub>1</sub> (mm)	Center detent	Total resistance (kΩ)	Resistance taper	Minimum order unit (pcs.)		Products No.	Drawing No.
						Japan	Export		
Single-unit	Flat	20	Without	10	1B	700 (C type)	1,400 (C type)	<b>RK09711110EL</b>	3
Dual-unit					15A			<b>RK0971221Z0X</b>	4

### Single-shaft momentary push (0.5mm travel) switch type

Number of resistor elements	Shaft type	Length of the shaft L <sub>1</sub> (mm)	Center detent	Total resistance (kΩ)	Resistance taper	Minimum order unit (pcs.)		Products No.	Drawing No.
						Japan	Export		
Single-unit	Flat	15	With	10	1B	700 (C type)	1,400 (C type)	<b>RK0971114Z1N</b>	5
Dual-unit for vol.		20	Without		15A			<b>RK0971224Z01</b>	6

## Notes

- Other varieties are also available. Refer to "Other Specifications" (P.291, 292).
- For automotive use, please contact us with detailed specifications.

Refer to P.291 for other specifications.  
Refer to P.293 for attached parts.  
Refer to P.295 for ordering products not listed.  
Refer to P.311 for soldering conditions.

■ Product Line

Single-shaft with push-lock mechanism type

Number of resistor elements	Shaft type	Length of the shaft L <sub>1</sub> (mm)	Center detent	Total resistance (kΩ)	Resistance taper	Minimum order unit (pcs.)		Products No.	Drawing No.
						Japan	Export		
Single-unit	Flat	25	Without	10	1B	700 (C type)	1,400 (C type)	<b>RK097111T065</b>	7
			With						
Dual-unit for vol.			Without		15A	600 (D type)	1,200 (D type)	<b>RK097122T017</b>	

Single-shaft with push-lock switch type

Number of resistor elements	Shaft type	Length of the shaft L <sub>1</sub> (mm)	Center detent	Total resistance (kΩ)	Resistance taper	Minimum order unit (pcs.)		Products No.	Drawing No.
						Japan	Export		
Single-unit	Flat	25	Without	5	1B	700 (C type)	1,400 (C type)	<b>RK097111U00S</b>	9

Dual-shaft, dual-unit without switch type

Number of resistor elements	Shaft	Shaft type	Length of the shaft L <sub>1</sub> , L <sub>2</sub> (mm)	Center detent	Total resistance (kΩ)	Resistance taper	Minimum order unit (pcs.)		Products No.	Drawing No.
							Japan	Export		
Dual-unit (Single-shaft, Single-unit)	The outer shaft	Slotted	15	Without	10	15A	700 (C type)	1,400 (C type)	<b>RK097221005C</b>	10
	The inner shaft	Flat	25							

Notes

1. Other varieties are also available. Refer to "Other Specifications" (P.291, 292).
2. For automotive use, please contact us with detailed specifications.

■ Packing Specifications

Tray

Minimum order unit type	Number of packages (pcs.)		Export package measurements (mm)
	1 case /Japan	1 case /export packing	
A type	1,200	2,400	463×375×185
B type	800	1,600	540×373×207
C type	700	1,400	540×373×181
D type	600	1,200	540×373×225

Rotary Potentiometers  
Slide Potentiometers

Metal Shaft

Insulated Shaft

Knob Operating

Through Shaft Type


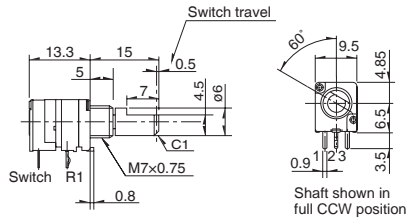
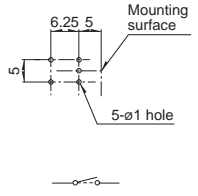
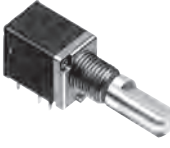
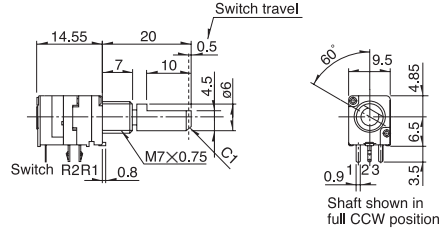
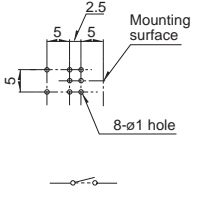

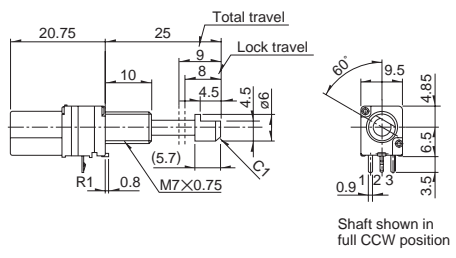
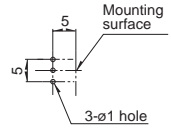

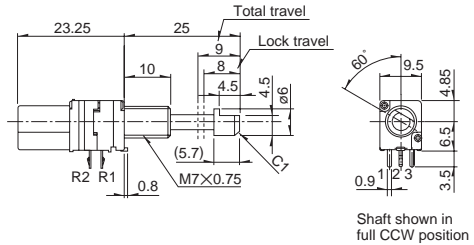
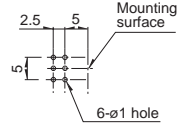
Ring Type

Refer to P.291 for other specifications.  
 Refer to P.293 for switch specifications.  
 Refer to P.293 for attached parts.  
 Refer to P.295 for ordering products not listed.  
 Refer to P.311 for soldering conditions.



Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
5	<p><b>Single-shaft, single-unit with momentary push switch travel 0.5mm</b> RK0971114-5R4211</p> 		
6	<p><b>Single-shaft, dual-unit with momentary push switch travel 0.5mm</b> RK0971214-5R4211 (For tone) RK0971224-5R4211 (For vol.)</p> 		
7	<p><b>Single-shaft, single-unit with push-lock mechanism</b> RK097111T</p> 		
8	<p><b>Single-shaft, dual-unit with push-lock mechanism</b> RK097122T (For vol.)</p> 		


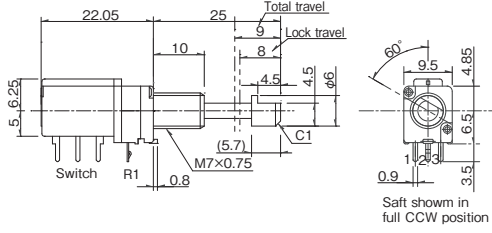
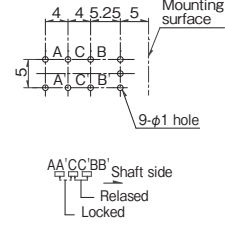

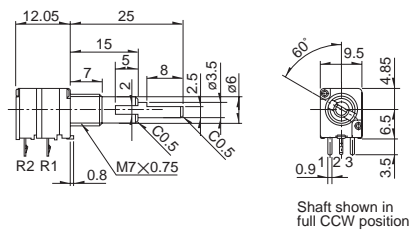
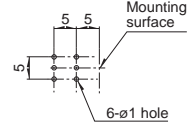
Rotary Potentiometers  
Slide Potentiometers

Metal Shaft  
Insulated Shaft  
Knob Operating  
Through Shaft Type  
Ring Type

# RK097 9mm Size Metal Shaft Multi-ganged Type

## Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
9	 <p><b>Single-shaft, single-unit with push-lock switch</b> <b>RK097111U-5R2522</b></p>		
10	 <p><b>Dual-shaft, dual-unit</b> <b>RK0972210</b></p>		

Rotary  
Potentiometers

Slide  
Potentiometers

Metal Shaft

Insulated  
Shaft

Knob  
Operating

Through  
Shaft Type

Ring Type

# 9mm Size Metal Shaft Multi-ganged Type / Other Specifications

In addition to the Product Line, we accommodate the following specifications. Combinations not included in the Product Line are treated as semi-standard products.

## Total Resistance Variety

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

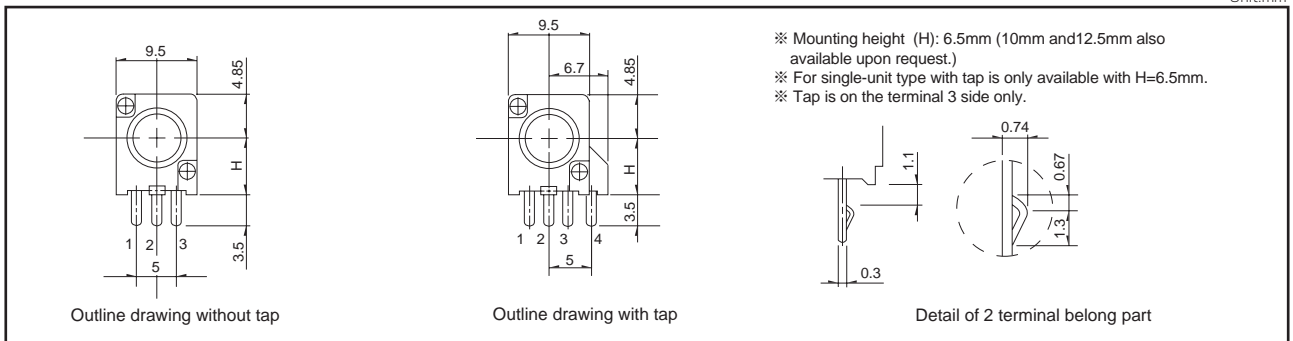
## Resistance Taper

Resistance taper	15A	1B	3B	15C
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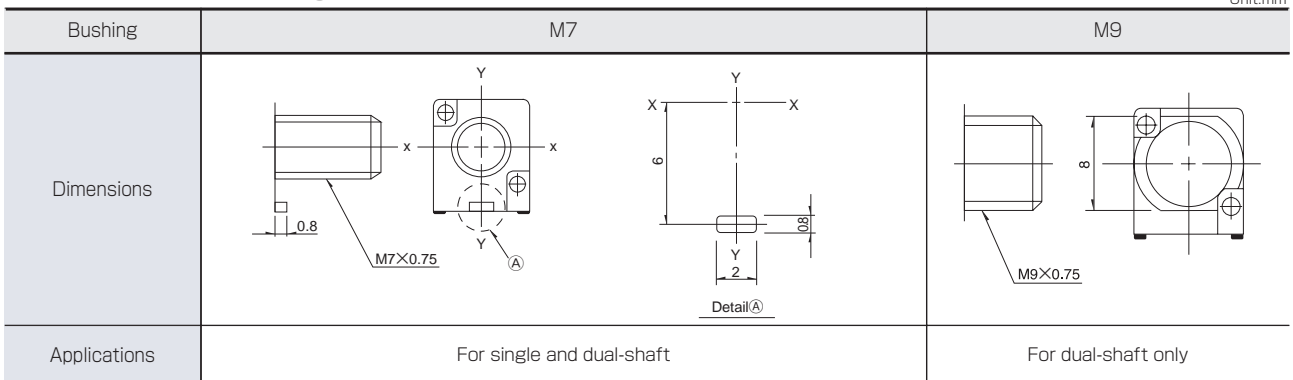
## Notes

Can be fitted with center-taps.

## Dimensions of Terminal

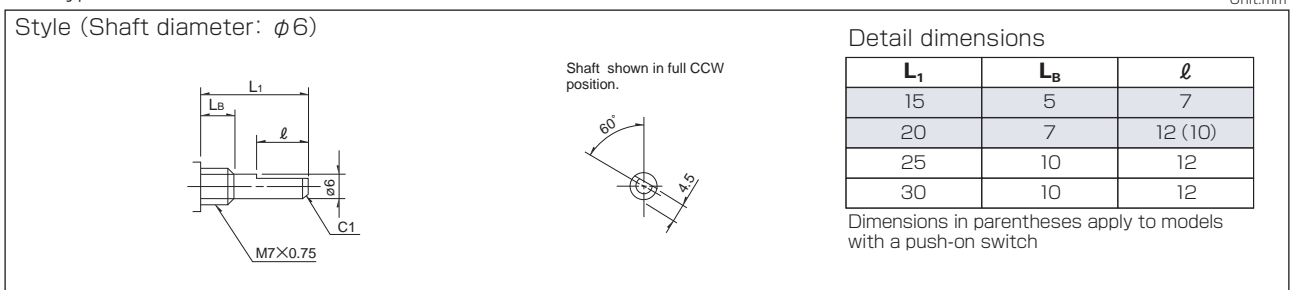


## Dimensions of Bushings



## Single-shaft Dimension

Flat type



## Note

Marked are specifications recommended by Alps Alpine.

Refer to P.295 for ordering products not listed.

# 9mm Size Metal Shaft Multi-ganged Type / Other Specifications

In addition to the Product Line, we accommodate the following specifications. Combinations not included in the Product Line are treated as semi-standard products.

## Dimension of Dual-shaft Type

Flat type for inner shaft, slotted type for outer shaft

Unit:mm

Style (Inner-shaft:  $\phi 6$  Outer-shaft:  $\phi 8$ )

Detail dimensions

$L_1$	$L_2$	$L_B$	$l_1$	$l_2$
20	10	5	8	4
25	15	7	8	5
30	20	10	8	5
35	25	10	8	5

Style (Inner-shaft:  $\phi 3.5$  Outer-shaft:  $\phi 6$ )

Detail dimensions

$L_1$	$L_2$	$L_B$	$l_1$	$l_2$
20	10	5	8	4
25	15	7	8	5
30	20	10	8	5
35	25	10	8	5

**Applications** Both switchless and rotary switch models are available.

## Shaft Dimensions of with Push-lock Mechanism/Switch

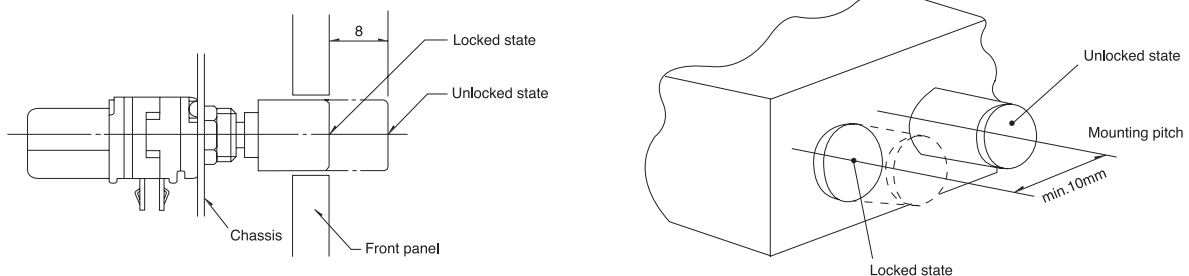
Unit:mm

Detail dimensions

$\ast L_1$	$L_B$	$A$	$l$
25	10	(5.7)	4.5
30	10	(10.7)	7
35	10	(15.7)	12

$\ast$ Dimensions in unlocked state

### Example of uses



### Note

Marked are specifications recommended by Alps Alpine.

# 9mm Size Metal Shaft Multi-ganged Type / Switch Specifications

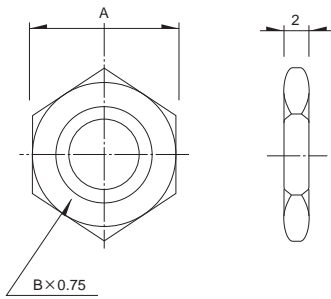
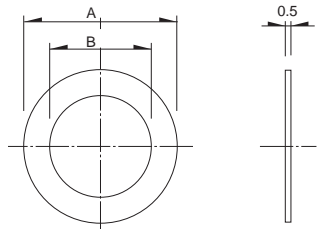
Switch type	Rotary switch	Momentary push switch	Push-lock switch
		5R1211	5R4211
Contact arrangement	Single pole and single throw	Single pole and single throw	Double pole and double throw
Travel	50° max.	0.5 <sup>+0.7</sup> <sub>-0.3</sub> mm	8±0.5mm
Changeover force	50mN·m max.	4 <sup>+4</sup> <sub>-2</sub> N	8N max.
Operating life under load	10,000 cycles		
Electrical performance	Rating	3A 16V DC (10mA 16V DC min. ratings)	0.5A 12V DC (10mA 12V DC min. ratings)
	Contact resistance	100mΩ max. for initial period, 200mΩ max. after operating life.	
	Insulation resistance	100MΩ min. 250V DC	
	Voltage proof	300V AC for 1 minute	

Rotary  
Potentiometers  
Slide  
Potentiometers

# 9mm Size Metal Shaft Multi-ganged Type / Attached Parts

The following parts are included with the product.

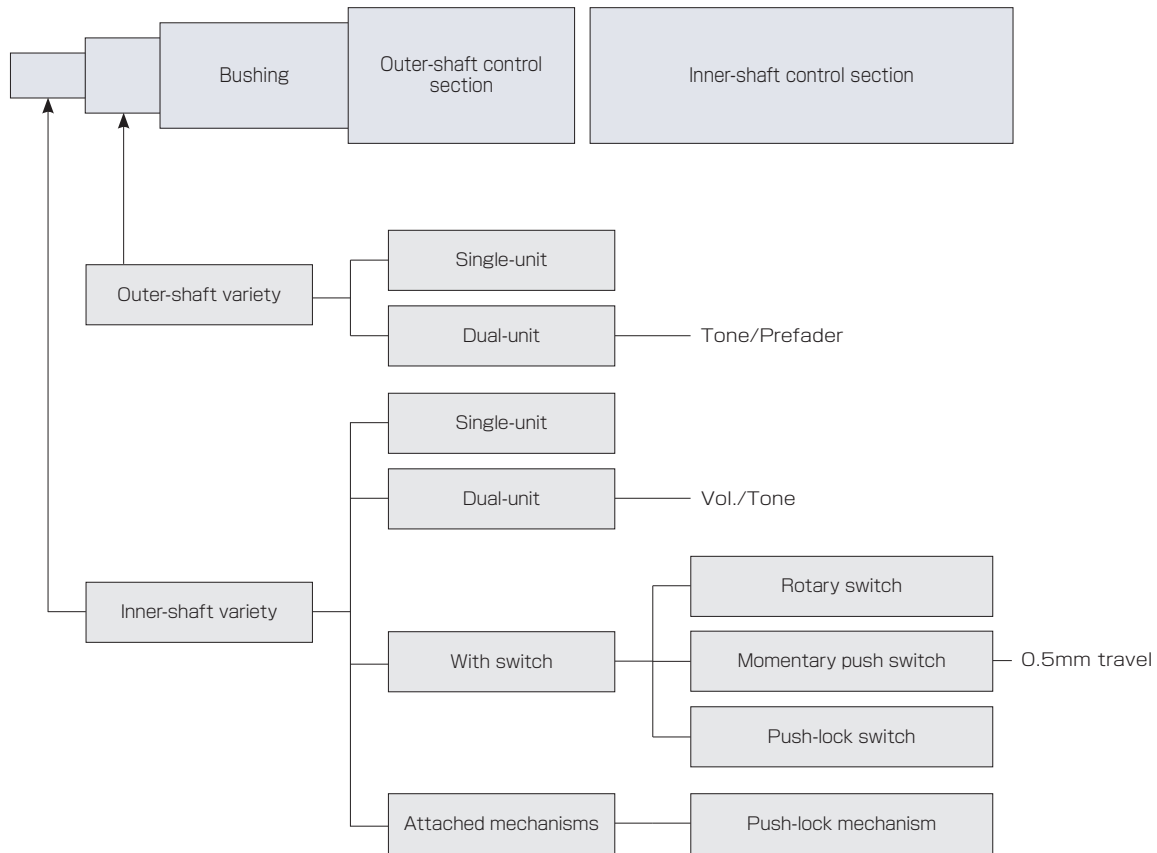
Unit:mm

Nut			Washer		
					
Bearing screw diameter	Dimension		Bearing screw diameter	Dimension	
	A	B		A	B
	M7	11		M7	φ12
M9	11	M9	φ14	φ9.1	

Metal Shaft  
Insulated  
Shaft  
Knob  
Operating  
Through  
Shaft Type  
Ring Type



# 9mm Size Metal Shaft Multi-ganged Type / Configuration Chart



**Note**

The single-shaft type product lineups are the same as those in the inner-shaft variety.

Rotary  
Potentiometers

Slide  
Potentiometers

Metal Shaft

Insulated  
Shaft

Knob  
Operating

Through  
Shaft Type

Ring Type

# 9mm Size Metal Shaft Multi-ganged Type / Ordering Products Not Listed

In addition to the Product Line, we accommodate the following specifications. Combinations not included in the Product Line are treated as semi-standard products. Please refer to the notation example below.

## Sample Part Number

**R K 0 9 7 1 1 1 0** - **F 1 5** - **C 0** - **B 1 0 3**

### Model type

Code	Model type
111	Single-shaft single-unit
121	Single-shaft dual-unit for tone
122	Single-shaft dual-unit for vol.

### Switch specifications

Code	Switch specifications
0	Without switch
1	With rotary switch
4	With momentary push switch (0.5mm travel)
T	With push-lock mechanism
U	Push-lock switch

### Shaft type

Code	Shaft type
F	Flat (shaft diameter : 6)

\* Shaft diameter 3.5 is individually specified.

### 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
C0	Without
C1	Center

\* With rotary switch; for applications in types other than push-lock mechanism.

### Resistance taper

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

\* The resistance taper for rotary switches are individually defined.  
B: For tone & general (model type : 111, 121)  
V: For vol. (model type : 111, 122)

### Total resistance

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

### Notes

- Marked are specifications recommended by Alps Alpine.
- The above specification is only applicable to the one-shaft single-unit model and dual-unit ganged model.

Rotary  
Potentiometers

Slide  
Potentiometers

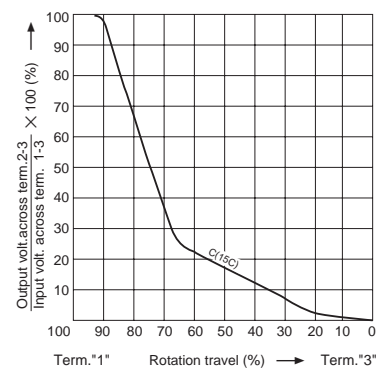
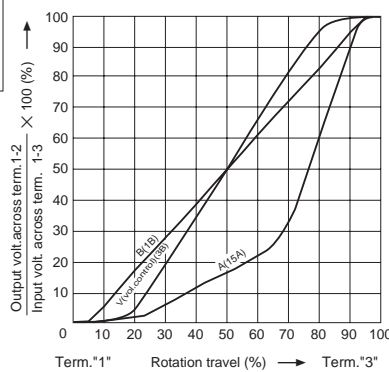
Metal Shaft

Insulated  
Shaft

Knob  
Operating









Through  
Shaft Type

Ring Type



# Metal Shaft Potentiometers

## List of Varieties

Type	9mm size				
Series	RK09L		RK0971	RK0972	
	Single-shaft			Dual-shaft	
Number of resistor elements	Single/dual			Dual	
Photo					
Control part orientation	Horizontal	Vertical	Horizontal		
Fixing method of bushing	Screw				
Operating temperature range	-10°C to +70°C		-20°C to +70°C -40°C to +85°C (Vehicle-compatible)		
Operating life	15,000 cycles				
Available for automotive use	—	—	○	○	
Life cycle (availability)					
Electrical performance	Total resistance (k Ω)	10, 20, 50, 100			
	Resistance taper	15A, 1B, 3B, 15C			
	Rated Power	0.05W			
	Residual resistance	$R \leq 10k\Omega$ 20Ω max. $10k\Omega < R \leq 50k\Omega$ 30Ω max. $50k\Omega < R$ Nominal total resistance of 0.1% or less			
	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 1 minute			
	Center-taps	Without	Without / With		
Mechanical performance	Detent	Without, Center			
	Stopper strength	0.5N·m	0.5N·m (With push-lock mechanism: 0.4N·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	
Terminal style	Insertion				
Attached switch	—	—	Rotary switch Push-on switch Push-lock switch	—	
Page	282		286	287	

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Potentiometers Cautions	384
Potentiometers Measurement and Test Methods	386
Potentiometers Resistance Taper	388

### 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.

# Metal Shaft Potentiometers / Soldering Conditions

## Reference for Manual Soldering

Series	Tip temperature	Soldering time	No. of solders
<b>RK09L, RK097</b>	350°C max.	3s max.	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.	1 time
	<b>Motor terminal</b>	350°C max.	

## Reference for Dip Soldering

Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
<b>RK09L, RK097</b>	100°C max.	2 min. max.	260±5°C	5±1s	2 times max.
<b>RK501</b>	120±10°C	2 min. max.	260±5°C	5±1s	2 times

Rotary Potentiometers

Slide Potentiometers

Metal Shaft

Insulated Shaft

Knob Operating

Through Shaft Type

Ring Type

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