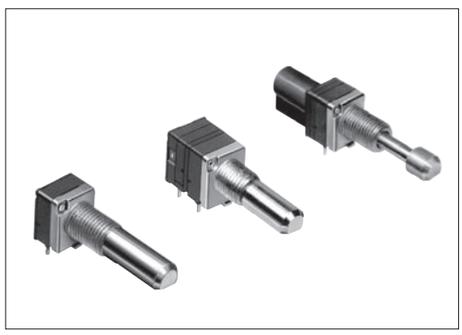
RK097 9mm Size Metal Shaft Multi-ganged Type

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° $^{+10°}_{-5°}$)
Rotational torque	2 to 25mN·m
Operating life	15,000 cycles
Operating temperature range	−20℃ to +70℃ −40℃ to +85℃ (Vehicle-compatible)

Product Line

Single-shaft without switch type

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L1 (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum order unit (pcs.) Japan	Minimum order unit (pcs.) Export	Products No.	Drawing No.
Single-unit	Horizontal type	Flat	15	Without	10	15A	1,200 (A type)	2,400 (A type)	**RK097111080J**	1
					20	1B			**RK0971110909**	
				With	10	15A			**RK0971110D7F**	
				Without	50	1B			**RK097111020N**	
			20		10	15A			**RK097111080R**	
				With		1B			**RK0971110D88**	
					50				**RK09711100F8**	
			25	Without	10	15A	800 (B type)	1,600 (B type)	**RK097111091M**	
						1B			**RK0971110D57**	
Dual-unit for tone			15		50		1,200 (A type)	2,400 (A type)	**RK09712100AV**	2
			20	With	20		800 (B type)	1,600 (B type)	**RK0971210Z2M**	
			25	Without	10				**RK0971210097**	
Dual-unit for vol.			15			15A	1,200 (A type)	2,400 (A type)	**RK09712200MC**	
						3B			**RK09712200MY**	
			20			15A	800 (B type)	1,600 (B type)	**RK09712200HA**	
						3B			**RK097122008T**	
					20	15A			**RK09712200MT**	

Notes

1. Other varieties are also available. Refer to "Other Specifications" (P.323, 324).
2. For automotive use, please contact us with detailed specifications.

Refer to P.323 for other specifications.
Refer to P.325 for attached parts.
Refer to P.327 for ordering products not listed.
Refer to P.349 for soldering conditions.

RK097 9mm Size Metal Shaft Multi-ganged Type

Product Line

Single-shaft with rotary switch type

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L1 (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum order unit (pcs.) Japan	Minimum order unit (pcs.) Export	Products No.	Drawing No.
Single-unit	Horizontal type	Flat	15	Without	20	15A	700 (C type)	1,400 (C type)	**RK0971111Z0P**	3
					50				**RK0971111Z32**	
			20		10				**RK09711110AL**	
						1B			**RK09711110EL**	
Dual-unit for vol.			15			3B			**RK0971221Z05**	4
			20		20				**RK0971221Z11**	

Single-shaft push-on push-off (1.5mm travel) switch type

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L1 (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum order unit (pcs.) Japan	Minimum order unit (pcs.) Export	Products No.	Drawing No.
Single-unit	Horizontal type	Flat	25	Without	10	15A	700 (C type)	1,400 (C type)	**RK097111202P**	5
						1B			**RK097111202Q**	
Dual-unit for vol.			20		50	3B	600 (D type)	1,200 (D type)	**RK097122200G**	6

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

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L1 (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum order unit (pcs.) Japan	Minimum order unit (pcs.) Export	Products No.	Drawing No.
Single-unit	Horizontal type	Flat	15	With	10	3B	700 (C type)	1,400 (C type)	**RK0971114D0B**	7
Dual-unit for tone			20	Without		1B			**RK0971214Z06**	8
Dual-unit for vol.						15A			**RK0971224Z01**	

Single-shaft momentary push (1.5mm travel) switch type

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L1 (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum order unit (pcs.) Japan	Minimum order unit (pcs.) Export	Products No.	Drawing No.
Single-unit	Horizontal type	Flat	20	Without	10	1B	700 (C type)	1,400 (C type)	**RK0971114Z07**	9

Notes

1. Other varieties are also available. Refer to "Other Specifications" (P.323, 324).
2. For automotive use, please contact us with detailed specifications.

Refer to P.323 for other specifications.
Refer to P.325 for switches.
Refer to P.325 for attached parts.
Refer to P.327 for ordering products not listed.
Refer to P.349 for soldering conditions.

Product Line

Single-shaft with push-lock mechanism type

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L_1 (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum order unit (pcs.) Japan	Minimum order unit (pcs.) Export	Products No.	Drawing No.
Single-unit	Horizontal type	Flat	25	Without	10	1B	700 (C type)	1,400 (C type)	**RK097111T065**	10
					100	15A			**RK097111TZ17**	
						1B			**RK097111T064**	
				With	10				**RK097111TD2M**	
					100				**RK097111TD44**	
Dual-unit for tone					10		600 (D type)	1,200 (D type)	**RK097121TD57**	11
Dual-unit for vol				Without		15A			**RK097122T017**	
					50	3B			**RK097122TZ0A**	

Dual-shaft, dual-unit without switch type

Number of resistor elements	Mounting direction	Shaft	Shaft type	Length of the shaft L_1 L_2 (mm)	Center detent	Total resistance (k Ω)	Resistance taper	Minimum order unit (pcs.) Japan	Minimum order unit (pcs.) Export	Products No.	Drawing No.
Dual-unit (Single-shaft, Single-unit)	Horizontal type	The outer shaft	Slotted	15	Without	10	15A	700 (C type)	1,400 (C type)	**RK097221005C**	12
		The inner shaft	Flat	25							
		The outer shaft	Slotted	15			15C			**RK097221004C**	
		The inner shaft	Flat	25							

Notes

1. Other varieties are also available. Refer to "Other Specifications" (P.323, 324).
2. For automotive use, please contact us with detailed specifications.

Packing Specifications

Tray

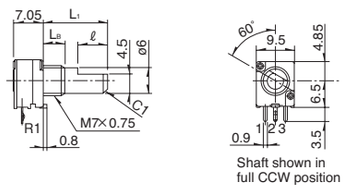
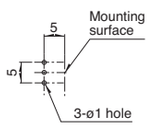
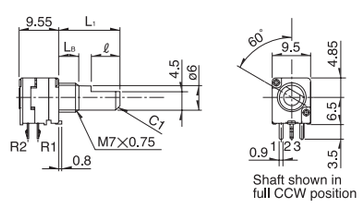
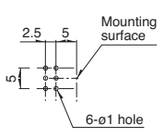
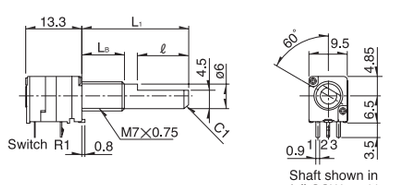
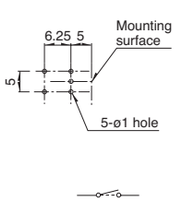
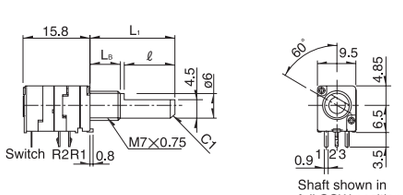
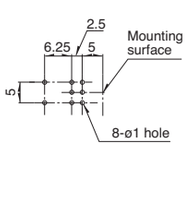
Minimum order unit type	Number of packages (pcs.) 1 case /Japan	Number of packages (pcs.) 1 case /export packing	Export package measurements (mm)
A type	1,200	2,400	375×490×185
B type	800	1,600	373×540×207
C type	700	1,400	373×540×181
D type	600	1,200	373×540×225

Refer to P.323 for other specifications.
Refer to P.325 for attached parts.
Refer to P.327 for ordering products not listed.
Refer to P.349 for soldering conditions.

RK097 9mm Size Metal Shaft Multi-ganged Type

Dimensions

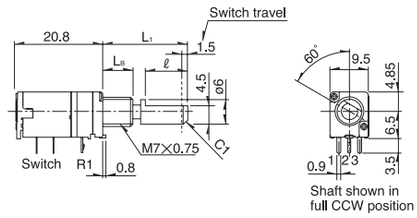
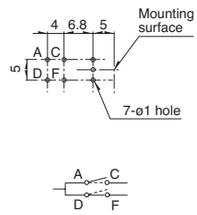
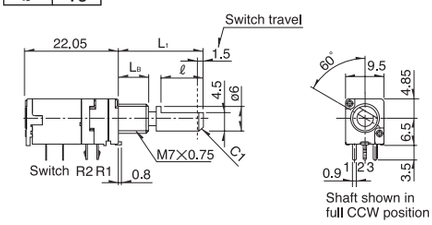
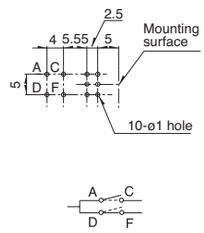
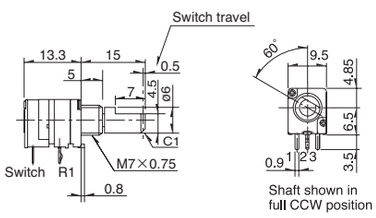
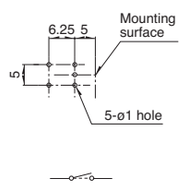
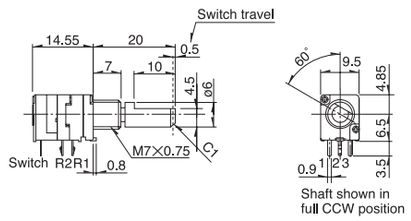
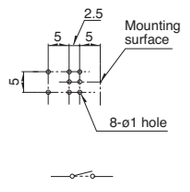
Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1	**Single-shaft, single-unit** **RK0971110** 	L_1 15 20 25 L_B 5 7 10 ℓ 7 12 12 	
2	**Single-shaft, dual-unit** **RK0971210 (For tone)** **RK0971220 (For vol.)** 	L_1 15 20 25 L_B 5 7 10 ℓ 7 12 12 	
3	**Single-shaft, single-unit** **with rotary switch** **RK0971111-5R1211** 	L_1 15 20 L_B 5 7 ℓ 7 12 	
4	**Single-shaft, dual-unit** **with rotary switch** **RK0971221-5R1211 (For vol.)** 	L_1 15 20 L_B 5 7 ℓ 7 12 	

ALPS

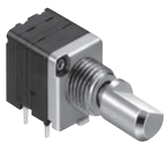
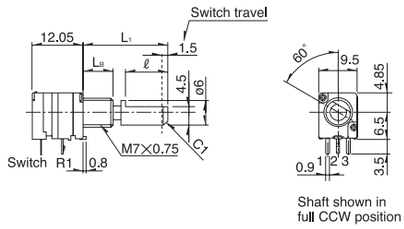
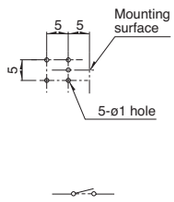
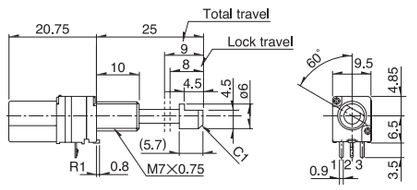
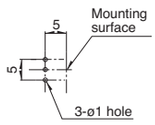
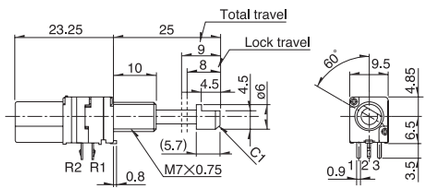
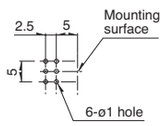
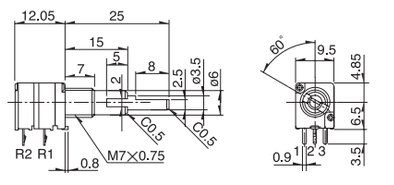
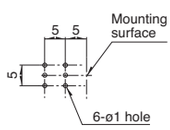
Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
5	**Single-shaft, single-unit with push-on push-off switch RK0971112-5R2412** 	L_1 25 L_B 10 ℓ 12 	
6	**Single-shaft, dual-unit with push-on push-off switch RK0971222-5R2412 (For vol.)** 	L_1 20 L_B 7 ℓ 10 	
7	**Single-shaft, single-unit with momentary push switch travel 0.5mm RK0971114-5R4211** 		
8	**Single-shaft, dual-unit with momentary push switch travel 0.5mm RK0971214-5R4211 (For tone) RK0971224-5R4211 (For vol.)** 		

Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
9	**Single-shaft, single-unit with momentary push switch travel 1.5mm RK0971114-5R4611** 	L_1 20 L_B 7 ℓ 10  Shaft shown in full CCW position	
10	**Single-shaft, single-unit with push-lock mechanism RK097111T** 	 Shaft shown in full CCW position	
11	**Single-shaft, dual-unit with push-lock mechanism RK097121T (For tone) RK097122T (For vol.)** 	 Shaft shown in full CCW position	
12	**Dual-shaft, dual-unit RK0972210** 	 Shaft shown in full CCW position	

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

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

Total Resistance Variety

Total resistance (kΩ)	10	20	50	100

Resistance Taper

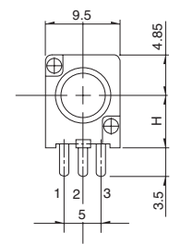
Resistance taper	15A	1B	3B	15C

Notes

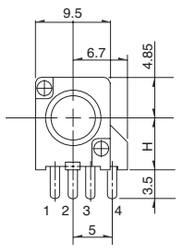
Can be fitted with center-taps.

Dimensions of Terminal

Unit:mm

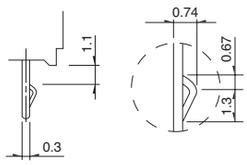


Outline drawing without tap



Outline drawing with tap

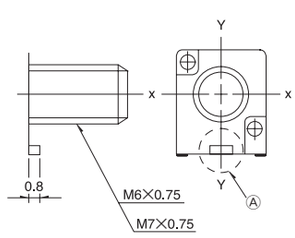
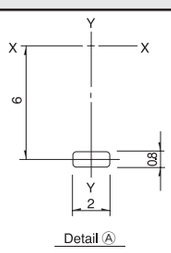
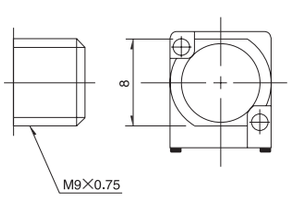
※ Mounting height (H): 6.5mm (10mm and12.5mm also available upon request.)
※ For single-unit type with tap is only available with H=6.5mm.
※ Tap is on the terminal 3 side only.



Detail of 2 terminal belong part

Dimensions of Bushings

Unit:mm

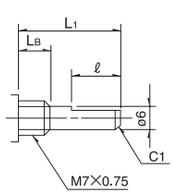
Bushing	M6	M7	M9
Dimensions			
Applications	For single-shaft only	For single and dual-shaft	For dual-shaft only

Single-shaft Dimension

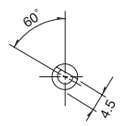
Flat type

Unit:mm

Style (Shaft diameter: ϕ6)



Shaft shown in full CCW position.

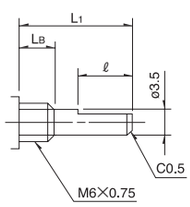


Detail dimensions

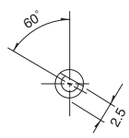
L_1	L_B	ℓ
15	5	7
20	7	12 (10)
25	10	12
30	10	12

Models in parenthesis apply to those with a push-on switch and those with a push-on, push-off switch.

Style (Shaft diameter: ϕ3.5)



Shaft shown in full CCW position.



Detail dimensions

L_1	L_B	ℓ
15	5	7
20	7	12 (10)
25	10	12
30	10	12

Models in parenthesis apply to those with a push-on switch and those with a push-on, push-off switch.

Refer to P.327 for ordering products not listed.

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

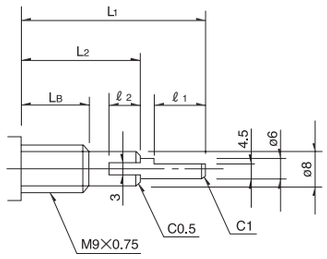
In addition to the products listed, we can accommodate the follow specifications.

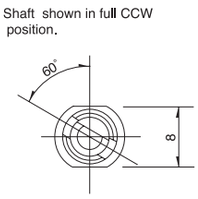
Dimension of Dual-shaft Type

Flat type for inner shaft, slotted type for outer shaft

Unit:mm

Style (Inner-shaft: φ6 Outer-shaft: φ8)

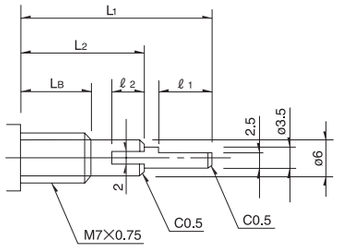


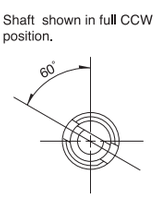


Detail dimensions

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: φ3.5 Outer-shaft: φ6)





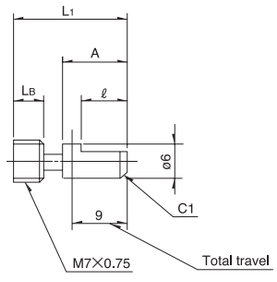
Detail dimensions

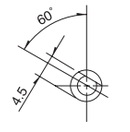
L_1	L_2	L_B	ℓ_1	ℓ_2
20	10	5	8	4
25	15	7	8	5
30	20	10	8	5
35	25	10	8	5

Applications Both switchless and rotary switch models are available.

Shaft Dimensions of with Push-lock Mechanism

Unit:mm





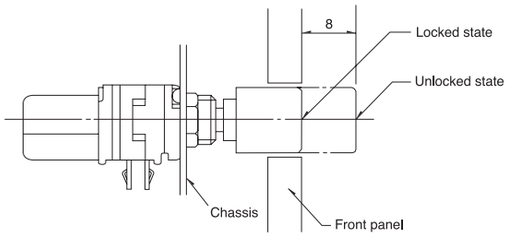
Shaft shown in full CCW position.

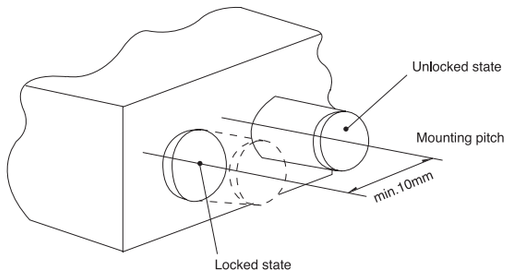
Detail dimensions

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

※Dimensions in unlocked state

Example of uses





Note

Marked are specifications recommended by Alps.

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

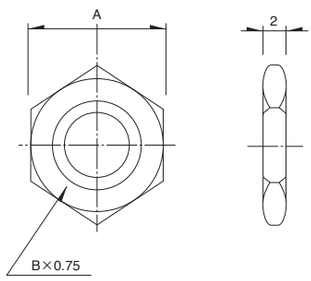
Switch type		Rotary switch		Push-on push-off switch		Momentary push switch	
		5R1211	5R1212	5R2412	5R2421	5R4211	5R4611
Contact arrangement		Single pole and single throw	Single pole and double throw		Double Pole Single throw	Single pole and single throw	
Travel		50° max.		1.5±0.5mm		0.5 $^{+0.7}_{-0.3}$ mm	1.5±0.5mm
Changeover force		50mN·m max.		12±8N		4 $^{+4}_{-2}$ N	5±2N
Operating life under load		10,000 cycles					20,000 cycles
Electrical performance	Rating	3A 16V DC (10mA 16V DC min. rating)	1A 16V DC (10mA 16V DC min. rating)	3A 16V DC (10mA 16V DC min. rating)		0.5A 12V DC (10mA 12V DC min. rating)	
	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					

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

The following parts are included with the product.

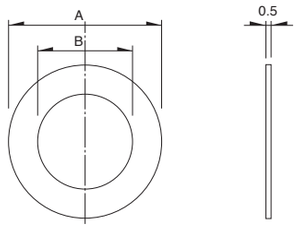
Unit:mm

Nut



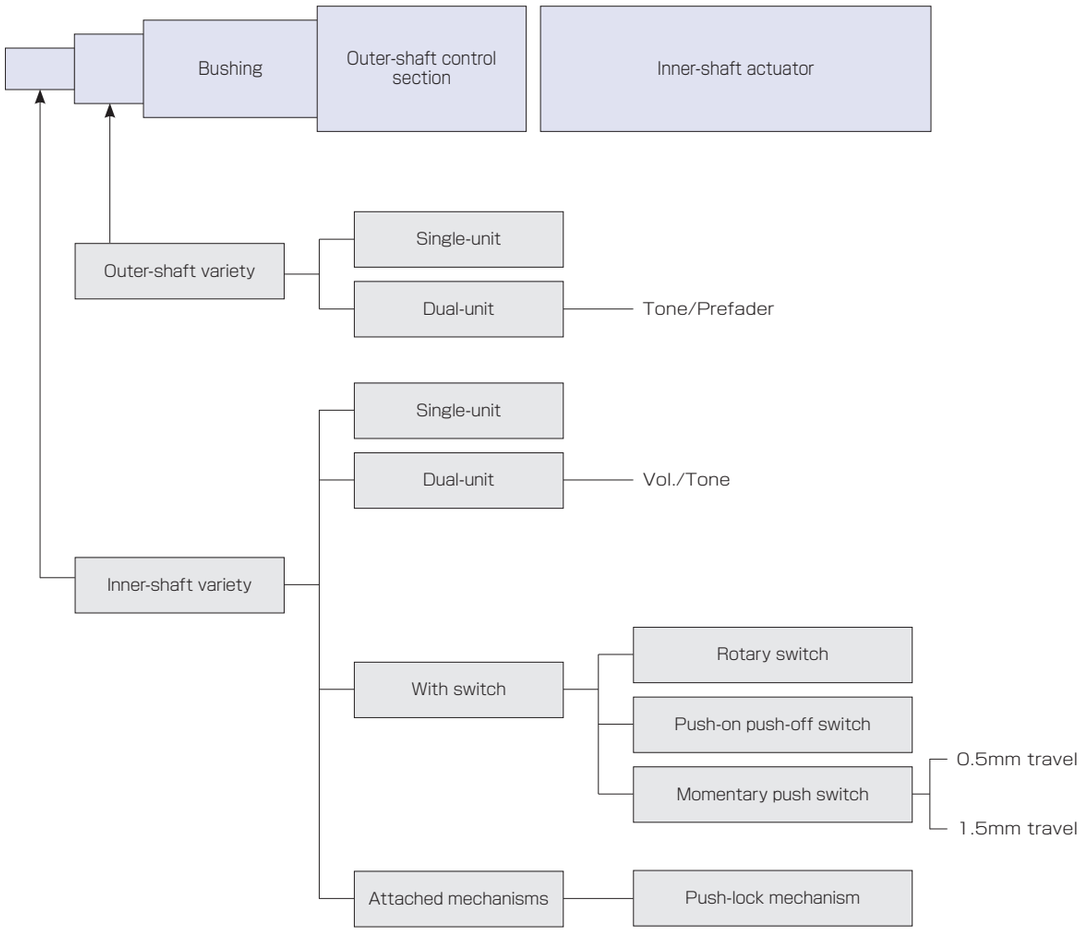
Bearing screw diameter	Dimension	
	A	B
M6	8	M6
M7	11	M7
M9	11	M9

Washer



Bearing screw diameter	Dimension	
	A	B
M6	ϕ10	6.2
M7	ϕ12	7.2
M9	ϕ14	9.1

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.

When ordering product varieties that are not listed, specify referring to the examples 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
2	With push-on push-off switch
4	With momentary push switch (0.5mm travel)
T	With push-lock mechanism

∗ Push on switch 1.5mm stroke is individually specified.

Shaft type

Code	Shaft type
F	Flat (shaft diameter : 6)

∗ Shaft diameter 3.5 is individually specified.

Length of the shaft L_1 (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	11	11
C1	Center	31	31

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

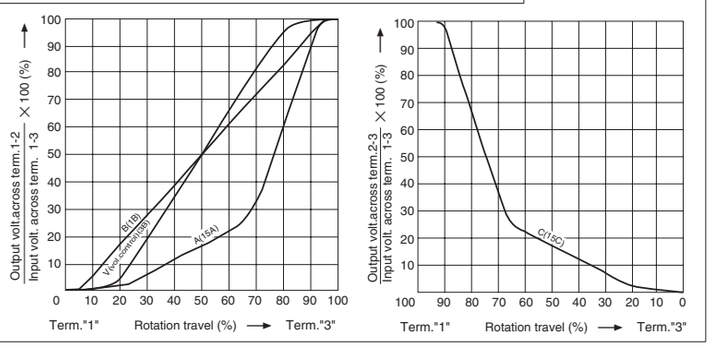
Resistance taper

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)
103	10	503	50
203	20	104	100

Notes

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

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℃ − 40℃ to + 85℃ (Vehicle-compatible)		−40℃ to +85℃
Operating life		15,000 cycles				
Available for automotive use		—	—	○	○	○
Life cycle (availability)		★2	★2	★2	★2	★2
Mechanical 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. 10kΩ<R<50kΩ 30Ω max. 50kΩ≦R Nominal total resistance of 0.1% or less				R≦10kΩ 50Ω max.
	Maximum attenuation (Volume control)	5kΩ≦R< 10kΩ 70dB min. 10kΩ≦R< 50kΩ 80dB min. 50kΩ≦R 90dB min.		5kΩ≦R< 10kΩ 70dB min. 10kΩ≦R< 50kΩ 80dB min. 50kΩ≦R<100kΩ 90dB min. 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
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

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

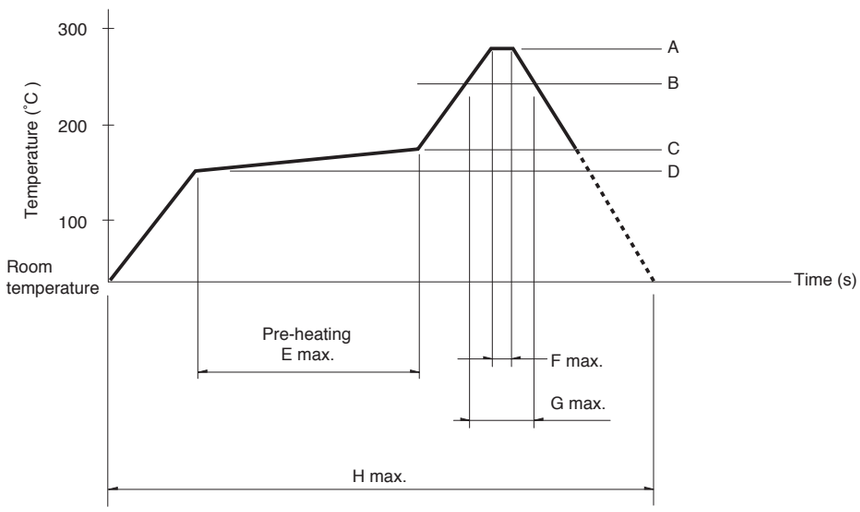
Series		Tip temperature	Soldering time	No. of solders
RK09L, RK097		350℃ max.	3s max.	1 time
RK203		300℃ max.	3s max.	1 time
RK119		350±10℃	$3\,^{+1}_{0}$ s	1 time
RK271		350℃ max.	5s max.	1 time
RK501		350±10℃	$5\,^{+1}_{0}$ s	1 time
RK163		350℃ max.	5s max.	1 time
RK168	**Potentiometer terminal**	300℃ max.	3s max.	1 time
	Motor terminal	350℃ 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	
RK09L, RK097, RK203	100℃ max.	2 min. max.	260±5℃	5±1s	2 time max.
RK501	120±10℃	2 min. max.	260±5℃	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℃	230℃	180℃	150℃	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℃ 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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