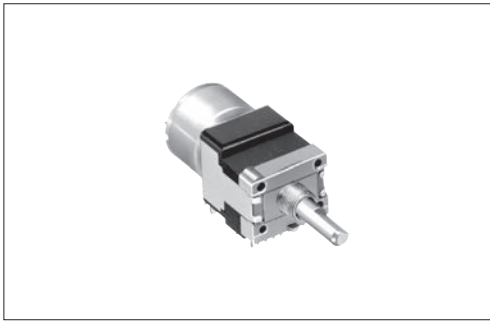


# RK168 Rotary Motor-driven Type

Remote controllable and available in a wide variety of products



## Typical Specifications



Items	Specifications
Total resistance tolerance	±20%
Maximum operating voltage	50V AC
Total rotational angle	300° ±5°
Rotational torque	10 to 40mN·m
Operating life	15,000 cycles
Operating temperature range	-10°C to +70°C
Motor voltage	4 to 6V DC (Standard: 4.5VDC)
Potentiometer rotational speed (sec/300°)	12±3 (4.5V DC)
Maximum operating current	At rotation: 100mA / At end slip: 150mA

## Product Line

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft L <sub>1</sub> (mm)	Total resistance (kΩ)	Resistance taper	Motor print terminal	Minimum order unit (pcs.)		Products No.	Drawing No.
							Japan	Export		
Dual-unit	Horizontal type	Flat	25	100	3B	With	200	200	<b>RK16812MG099</b>	1
Quad-unit					15A	Without			<b>RK16814MGA0K</b>	2

## Note

Other varieties are also available. Refer to "Other Specifications" (P.347).

## Packing Specifications

Tray

Number of packages (pcs.)		Export package measurements (mm)
1 case /Japan	1 case /export packing	
200	200	368×527×215

## Dimensions

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1	<p><b>16mm size Single-shaft, dual-unit RK16812MG</b></p>		
2	<p><b>16mm size Single-shaft, quad-unit RK16814MG</b></p>		

Refer to P.347 for other specifications.

Refer to P.348 for attached parts.

Refer to P.349 for soldering conditions.

# Rotary Motor-driven Type / Other Specifications

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

## Basic Motor Specifications

Number of unit	Model	Motor type		Motor voltage	Potentiometer rotational speed	Max. operating current
		Sealed case	Motor printed terminal			
Single-shaft, dual-unit	<b>RK16812MG</b>	Available	Available	4 to 6V DC (Standard: 4.5)	12±3sec/300° (4.5V DC)	At rotation 100mA  At end slip 150mA (4.5V DC)
Single-shaft, quad-unit	<b>RK16814MG</b>					
Single-shaft, 5-ganged-unit	<b>RK16815MG</b>					
Single-shaft, 6-ganged-unit	<b>RK16816MG</b>					

## Total Resistance Variety

Total resistance (kΩ)	10	20	50	100

## Resistance Taper

Resistance taper	15A	3B

## Shaft Variety

Unit:mm

L <sub>1</sub>
20
25
30

Shaft shown in full CCW position

## Standard Dimensions of Bushing and Fixing Lug

Unit:mm

The self-tapping screw should extend 6.5mm below the mounting surface.

## Style of Printed Terminal for Motor

Unit:mm

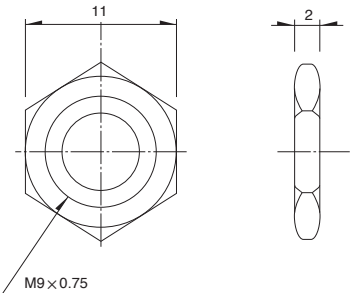
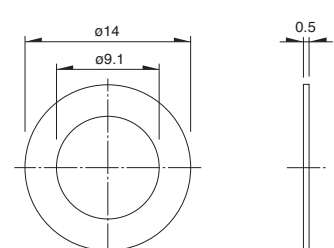
### Note

Marked are specifications recommended by Alps.

# Rotary Motor-driven Type / Attached Parts

The following parts are included with the product.

Unit:mm

Nut	Washer
 <p>11</p> <p>2</p> <p>M9 x 0.75</p>	 <p>ø14</p> <p>ø9.1</p> <p>0.5</p>

Rotary  
 Potentiometers  
 Slide  
 Potentiometers

Metal  
 Shaft











Insulated  
 Shaft

Knob  
 Operating

Ring  
 Type

# Metal Shaft Potentiometers

## List of Varieties

Type	16mm size	20mm size	27mm size	50mm size	Rotary motor-driven	
Series	<b>RK163</b>	<b>RK203/EC20A</b>	<b>RK271</b>	<b>RK501</b>	<b>RK168</b>	
Single-shaft						
Number of resistor elements	Single/dual	Single	Single/dual/quad	Dual/quad	Dual/quad/5-ganged/6-ganged	
Photo						
Terminal mounting	Horizontal	Vertical	Horizontal			
Fixing method of bushing	Bushing screw clamp					
Operating temperature range	-10°C to +70°C	RK203: -40°C to +85°C EC20A: -30°C to +80°C	-10°C to +70°C			
Operating life	15,000 cycles	30,000 cycles	15,000 cycles			
Available for automotive use	—	○	—	—	—	
Life cycle (availability)						
Electrical performance	Total resistance (kΩ)	5, 10, 20, 50, 100, 200	10	5, 10, 20, 50, 100, 250	10, 20, 50, 100	
	Resistance taper	15A, 1B, 3B, 15C	B	15A, 3B		
	Rated Power	0.1W 0.05W (15A)	0.05W		0.1W	0.05W
	Residual resistance	R≤10kΩ 20Ω max. 10kΩ<R≤50kΩ 30Ω max. 50kΩ<R<3MΩ Nominal total resistance of 0.1% or less%	—	R≤10kΩ 20Ω max. 10kΩ<R<50kΩ 30Ω max. 50kΩ≤R Nominal total resistance of 0.1% or less%	—	—
	Maximum attenuation (Volume control)	5kΩ≤R<10kΩ 70dB min. 10kΩ≤R<50kΩ 80dB min. 50kΩ≤R<100kΩ 90dB min. 100kΩ≤R 100dB min.	—	5kΩ≤R<10kΩ 70dB min. 10kΩ≤R<50kΩ 80dB min. 50kΩ≤R<100kΩ 90dB min. 100kΩ≤R 100dB min.	120dB 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.	—	-70dB to -60dB 3dB max. -60dB to 0dB 2dB max.	-100dB to 0dB 2dB max.	-60dB to -40dB 5dB max. -40dB to 0dB 3dB max.
	Insulation resistance	100MΩ min. 500V DC	10MΩ min. 250V DC	100MΩ min. 500V DC		100MΩ min. 250V DC
	Voltage proof	500V AC for 1minute	300V AC for 1minute	500V AC for 1minute		300V AC for 1minute
	Center-taps	Without				
Mechanical performance	Detent	Without, Center, 21, 31, 41	17	Without, Center, 21, 31, 41	Without	
	Stopper strength	0.9	0.5	0.9	1.5	0.9
	Push-pull strength	100N max.		150N 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 for 2 hours respectively				
Shaft style	Serrated type, Flat type, Slotted type	Flat type	Slotted type, Flat type	Slotted type	Flat type	
Terminal style	Insertion, Lead	Insertion				
Attached switch	—	EC20A: Momentary push switch	—	—	—	
Page	332	337	340	344	346	

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

### Note

○ Indicates applicability to some products in the series.

## Reference for Manual Soldering

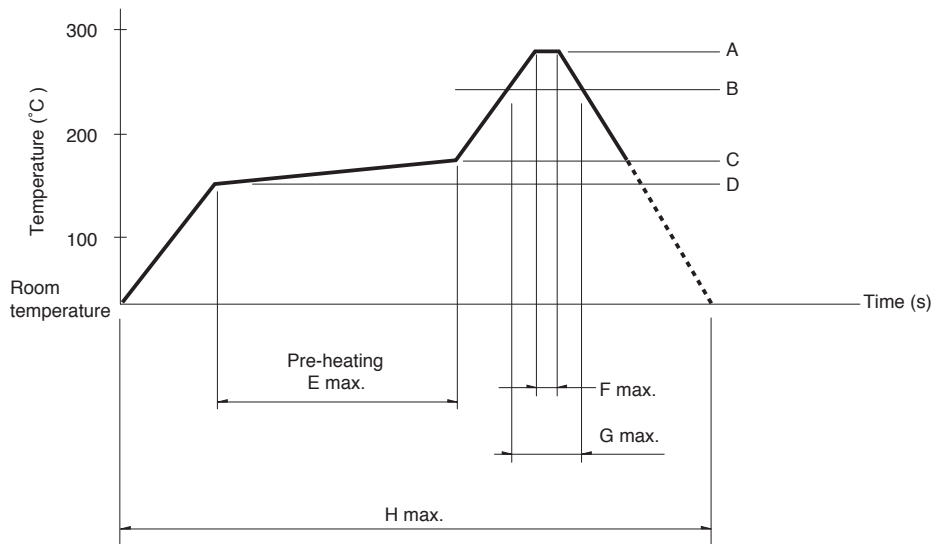
Series	Tip temperature	Soldering time	No. of solders
<b>RK09L, RK097</b>	350°C max.	3s max.	1 time
<b>RK203</b>	300°C max.	3s max.	1 time
<b>RK119</b>	350±10°C	3 <sup>+1</sup> <sub>0</sub> s	1 time
<b>RK271</b>	350°C max.	5s max.	1 time
<b>RK501</b>	350±10°C	5 <sup>+1</sup> <sub>0</sub> s	1 time
<b>RK163</b>	350°C max.	5s max.	1 time
<b>RK168</b>	<b>Potentiometer terminal</b>	300°C max.	3s max.
	<b>Motor terminal</b>	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	
<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.