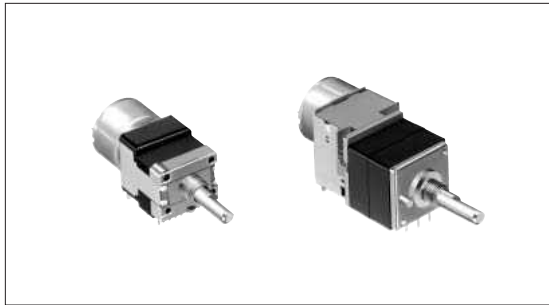


# Metal Shaft Potentiometer Rotary Motor-driven Type

RK168/RK271 Series



Remote controllable and available in a wide variety of products.



## Features

- Remote-controllable potentiometers for various audio equipment.
- Supports motor driving and manual operation.

## Applications

- For controlling volume in amplifiers CD players, karaoke machines and radio cassettes

Rotary Potentiometers

Slide Potentiometers

Multi Control Devices

Sensors

Metal Shaft

Insulated Shaft

Hollow Type

Knob Operating

## Typical Specifications

Items	Specifications	
	RK168	RK271
Total resistance tolerance	±20%	
Maximum operating voltage	50V AC	30V AC
Total rotational angle	300±5°	
Rotational torque	10 to 40mN·m	15 to 45mN·m
Operating life	15,000cycles	
Operating temperature range	-10°C to +70°C	
Motor voltage	4 to 6V DC (Standard : 4.5V DC)	
Potentiometer rotational speed (sec/300°)	12±3 (4.5V DC)	
Maximum operating current	At rotation : 100mA / At end slip : 150mA	

## Recommended Products List

Type	Model	Number of resistor elements	Shaft type	Length of the shaft (mm)	Total resistance (kΩ)	Resistance taper	Motor print terminal	Minimum packing unit (pcs.)	Products No.	Drawing No.
16mm size	RK1681□MG0	Dual-unit	Flat	25	100	3B	With	200	RK16812MG099	1
		Quad-unit			20	15A	Without		RK16814MG02R	2
		6 ganged-unit			100	3B	With		RK16816MGA04	3
27mm size	RK27112MC0	Dual-unit					15A	Without	150	RK27112MC030


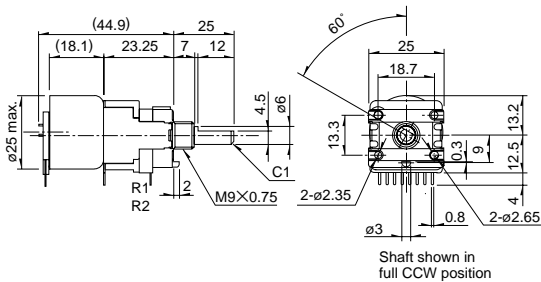
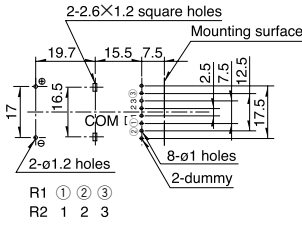

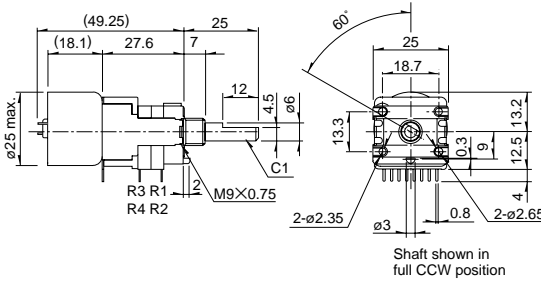
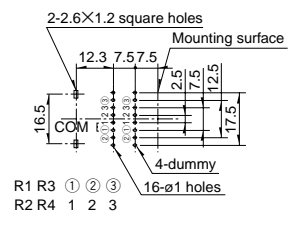

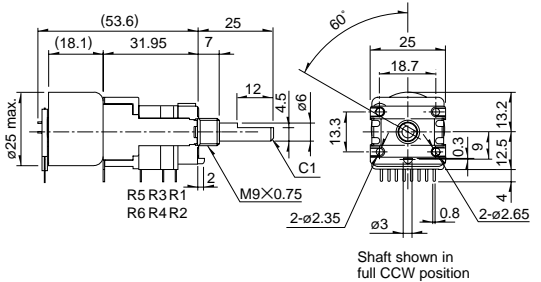
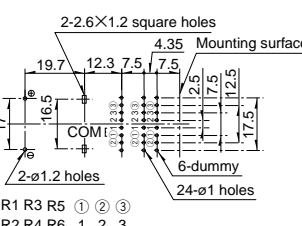

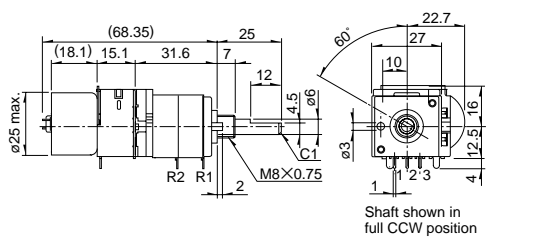
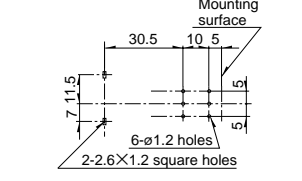
Refer to P.54 for attached parts.

**Dimensions**

Unit:mm

Rotary Potentiometers  
 Slide Potentiometers  
 Multi Control Devices  
 Sensors

Metal Shaft  
 Insulated Shaft  
 Hollow Type  
 Knob Operating

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1	<p><b>16mm size Single-shaft, dual-unit RK16812MG</b></p> 	 <p>Shaft shown in full CCW position</p>	 <p>2-2.6X1.2 square holes              Mounting surface              2-ø1.2 holes              8-ø1 holes              2-dummy</p> <p>R1 ① ② ③              R2 1 2 3</p>
2	<p><b>16mm size Single-shaft, quad-unit RK16814MG</b></p> 	 <p>Shaft shown in full CCW position</p>	 <p>2-2.6X1.2 square holes              Mounting surface              4-dummy              16-ø1 holes</p> <p>R1 R3 ① ② ③              R2 R4 1 2 3</p>
3	<p><b>16mm size Single-shaft, 6-ganged unit RK16816MG</b></p> 	 <p>Shaft shown in full CCW position</p>	 <p>2-2.6X1.2 square holes              Mounting surface              6-dummy              24-ø1 holes</p> <p>R1 R3 R5 ① ② ③              R2 R4 R6 1 2 3</p>
4	<p><b>27mm size Single-shaft, dual-unit RK27112MC</b></p> 	 <p>Shaft shown in full CCW position</p>	 <p>6-ø1.2 holes              2-2.6X1.2 square holes              Mounting surface</p>

## Product Varieties

In addition to the recommended products, the following specifications can also be accommodated.

### Basic Motor Specifications

Type	Number of unit	Model	Motor type		Motor voltage	Potentiometer rotational speed	Max. operating current
			Sealed case	Motor printed terminal			
16mm size	Single-shaft, dual-unit	RK16812MG	Available	Available	4 to 6V DC (Standard:4.5)	$12 \pm 3 \text{sec}/300^\circ$ (4.5V DC)	At rotation 100mA  At end slip 150mA (4.5V DC)
	Single-shaft, quad.-unit	RK16814MG					
	Single-shaft, 5-ganged-unit	RK16815MG					
	Single-shaft, 6-ganged-unit	RK16816MG					
27mm size	Single-shaft, dual-unit	RK27112MC					
	Single-shaft, quad.-unit	RK27114MC					

### Total Resistance Variety

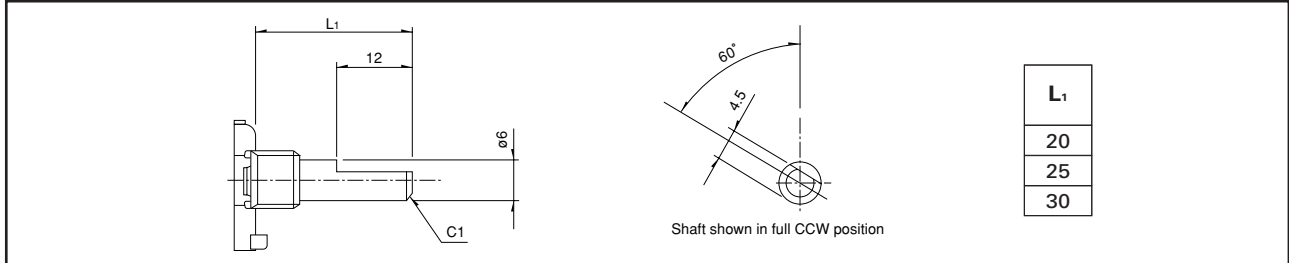
Total resistance (kΩ)	10	20	50	100
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### Resistance Taper

Resistance taper	15A	3B
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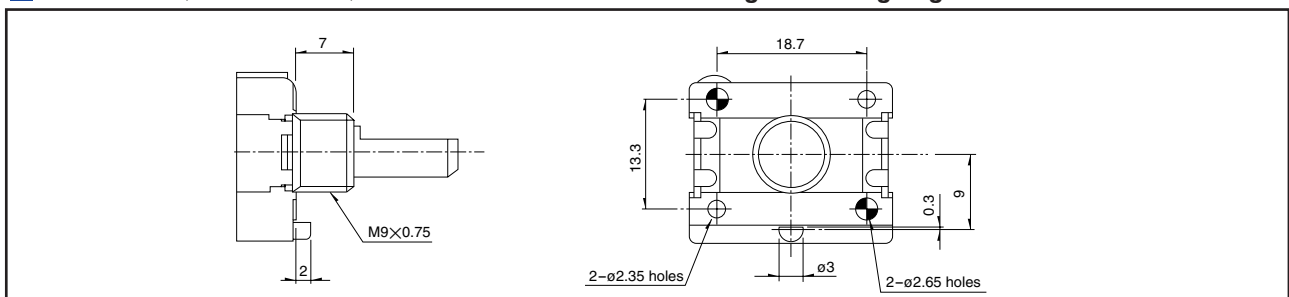
### 16mm Size (RK168 Series) Shaft Variety

Unit:mm



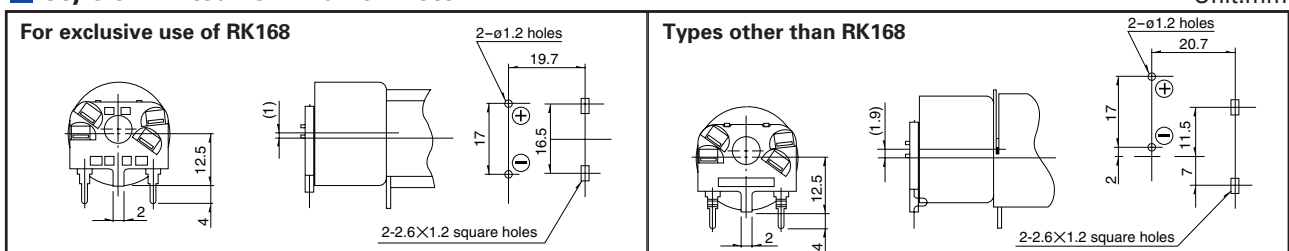
### 16mm Size (RK168 Series) Standard Dimensions of Bushing and Fixing Lug

Unit:mm



### Style of Printed Terminal for Motor

Unit:mm



### Note

marked are specifications recommended by ALPS.

## Product Specifications

Model		RK09L	RK097 RK098	RK117	RK119	RK163 RK168
<b>Items</b>						
<b>Operating temperature range</b>		-10°C to +70°C	-20°C to +70°C	-30°C to +70°C	-40°C to +85°C	-10°C to +70°C
<b>Electrical performance</b>	<b>Total resistance tolerance</b>	±20%				
	<b>Rated power</b>	0.05W				
	<b>Maximum operating voltage</b>	50V AC, 10V DC				RK163: 150V AC, 5V, DC RK168: 50V AC
	<b>Residual resistance</b>	$R \leq 10k\Omega$ $10k\Omega < R < 50k\Omega$ $50k\Omega \leq R$	20Ω max. 30Ω max. Nominal total resistance of 0.1% or less		$R \leq 10k\Omega$ 50Ω max. $10k\Omega < R \leq 50k\Omega$ 80Ω max. $50k\Omega < R$ Nominal total resistance of 0.2% or less	$R \leq 10k\Omega$ 20Ω max. $10k\Omega < R \leq 50k\Omega$ 30Ω max. $50k\Omega < R$ Nominal total resistance of 0.1% or less
	<b>Maximum attenuation (Volume control)</b>		$5k\Omega \leq R < 10k\Omega$ $10k\Omega \leq R < 50k\Omega$ $50k\Omega \leq R < 100k\Omega$ $100k\Omega \leq R$	70dB min. 80dB min. 90dB min. 100dB min.		
	<b>Insulation resistance</b>	100MΩ min. 250V DC				RK163: 100MΩ min. 500V DC RK168: 100MΩ min. 250V DC
	<b>Voltage proof</b>	300V AC (for 1minute)				RK163: 500V AC for minute RK168: 300V AC for minute
<b>Mechanical performance</b>	<b>Total rotational angle</b>	300±5°	300±5° (Shaft movement type is 300 $\pm$ 5°)	300 $\pm$ 5°		RK163: 300±3° RK168: 300±5°
	<b>Rotational torque</b>	2 to 25mN·m		5 to 20mN·m	7.5±3.5mN·m	RK163: 3 to 25mN·m RK168: 10 to 40mN·m
	<b>Stopper strength</b>	0.5N·m (With push-lock mechanism type: 0.4N·m)			0.5N·m	0.9N·m
	<b>Push-pull strength</b>	80N max.	100N max.			
	<b>Vibration</b>	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				
	<b>Solder heat resistance</b>	<b>Manual soldering</b>	350°C max. 3s max.			350±10°C 3 $\pm$ 0s
<b>Dip soldering</b>		260±5°C, 5±1s			—	
<b>Reflow soldering</b>		—			Please see P.35	—
<b>Endurance</b>	<b>Operating life</b>	15,000cycles				
<b>Environmental performance</b>	<b>Cold</b>	-20°C±2°C for 96h	-30±2°C for 96h		-40±2°C for 240h	-20±2 for 96h
	<b>Dry heat</b>	70±2°C for 96h			85±2°C for 240h	70±2°C for 96h
	<b>Damp heat</b>	40±2°C, 90 to 95%RH for 96h			60±2°C, 90 to 95%RH for 240h	40±2°C, 90 to 95%RH for 96h

### Push-on Switch Specifications

Items	RK097		RK117		RK119	
<b>Contact arrangement</b>	Single pole and single throw (Push on)					
<b>Travel (mm)</b>	0.5	1.5	0.5	1.5	0.5±0.3	1.5±0.5
<b>Operating force (N)</b>	4 $\pm$ 2	5±2	6±3	5±2		4±2
<b>Rating</b>	0.5A 12V DC		3A 16V DC		0.1A 5V DC (1mA 5V DC min.ratings)	0.5A 16V DC (1mA 16V DC min.ratings)
<b>Contact resistance</b>	100mΩ for initial period; 200mΩ after operating life					
<b>Operating life</b>	10,000 times min.	20,000 times min.	10,000 times min.	20,000 times min.	100,000 times min.	20,000 times min.

#### Note

The operating temperature range for automotive applications can be raised upon request. Please contact us for requirements of this kind.

## Product Specifications

Model		RK203	RK20B	RK271	RK501	
<b>Items</b>						
<b>Operating temperature range</b>		-30°C to +80°C	-10°C to +105°C	-10°C to +70°C		
<b>Electrical performance</b>	<b>Total resistance tolerance</b>	±20%				
	<b>Rated power</b>	0.05W	0.06W	0.05W	0.1W	
	<b>Maximum operating voltage</b>	50V AC 30V DC	20V DC	30V AC	150V AC	
	<b>Residual resistance</b>	_____		R ≤ 10kΩ 20Ω max. 10kΩ < R ≤ 50kΩ 30Ω max. 50kΩ < R 0.1% or less of nominal total resistance	_____	
	<b>Maximum attenuation (Volume control)</b>	_____		5kΩ ≤ R < 10kΩ 70dB min. 10kΩ ≤ R < 50kΩ 80dB min. 50kΩ ≤ R < 100kΩ 90dB min. 100kΩ ≤ R 100dB min.	120dB min.	
	<b>Insulation resistance</b>	100MΩ min. 250V DC		100MΩ min. 500V DC		
	<b>Voltage proof</b>	300V AC (for 1minute)		500V AC (for 1minute)		
<b>Mechanical performance</b>	<b>Total rotational angle</b>	240° max.	360°	300±3° Motor-driven 300±5°	300±3°	
	<b>Rotational torque (mN·m)</b>	Shall be in accordance with individual specifications.	20 to 80	8 to 35 Motor-driven 15 to 45	13 to 43	
	<b>Stopper strength (N·m)</b>	0.5	_____	0.9	1.5	
	<b>Push-pull strength</b>	100N max.			150N max.	
	<b>Vibration</b>	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				
	<b>Solder heat resistance</b>	<b>Manual soldering</b>	300°C max. 3s max.	350°C max., 3s max.	350°C max. 5s max. Motor terminal: 350°C max. 2s max.	350±10°C, 5 <sup>+1</sup> 0s
		<b>Dip soldering</b>	260±5°C, 5±1s	260°C max., 5s max.	_____	260±5°C, 5±1s
<b>Reflow soldering</b>		_____				
<b>Endurance</b>	<b>Operating life</b>	30,000cycles	15,000cycles			
<b>Environmental performance</b>	<b>Cold</b>	-40±2°C for 192h	-30±3°C for 96h	-30±3°C for 96h	-20±3°C for 240h	
	<b>Dry heat</b>	85±2°C for 192h	105±2°C for 240h	70±2°C for 96h	70±2°C for 240h	
	<b>Damp heat</b>	60±3°C, 90 to 95%RH for 240h	60±2°C, 90 to 95%RH for 240h	40±2°C, 90 to 95%RH for 96h	60±2°C, 90 to 95%RH for 240h	

**Note**

The operating temperature range for automotive applications can be raised upon request. Please contact us for requirements of this kind.

Rotary Potentiometers

Slide Potentiometers

Multi Control Devices

Sensors

Metal Shaft

Insulated Shaft

Hollow Type

Knob Operating

## Attached Parts

The following parts are included with the product.

Unit:mm

Applicable products	Bearing screw diameter	Hexagonal nut	Flat washer
<b>RK09L</b> <b>RK168</b> <b>RK097</b> <b>RK203</b>	M9		
<b>RK271</b>	M8		
<b>RK097</b> <b>RK098</b> <b>RK163</b>	M7		
<b>RK097</b> <b>RK098</b>	M6		

Rotary Potentiometers

Slide Potentiometers

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Metal Shaft

Insulated Shaft

Hollow Type

Knob Operating