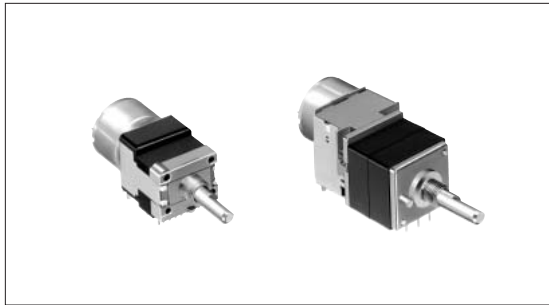


Metal Shaft Potentiometer Rotary Motor-driven Type

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	4	

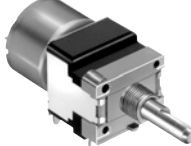
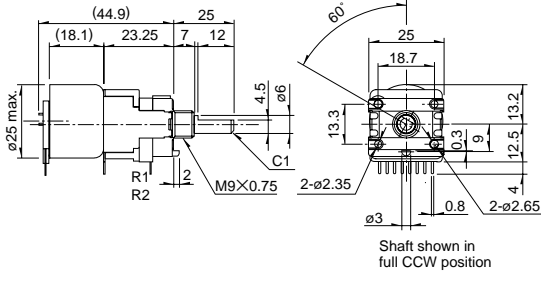
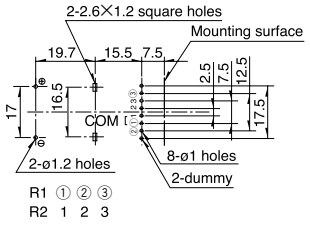
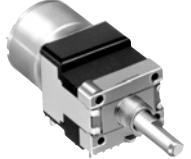
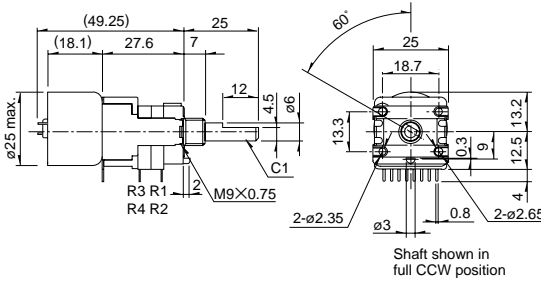
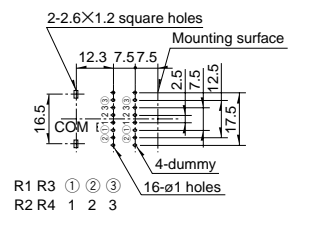
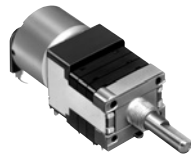
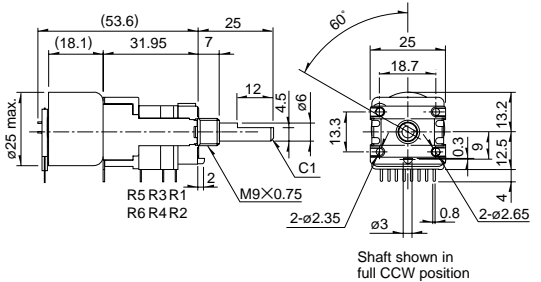
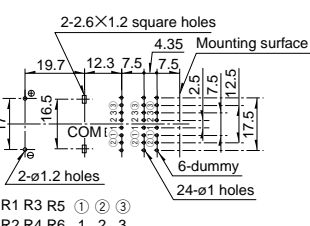

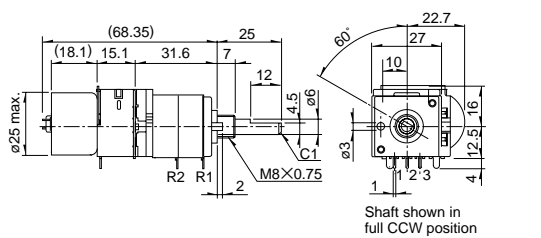
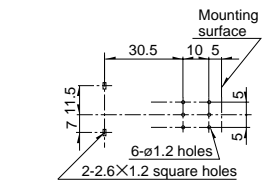
Refer to P.54 for attached parts.

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>16mm size Single-shaft, dual-unit RK16812MG</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>16mm size Single-shaft, quad-unit RK16814MG</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>16mm size Single-shaft, 6-ganged unit RK16816MG</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>27mm size Single-shaft, dual-unit RK27112MC</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±3sec/300° (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

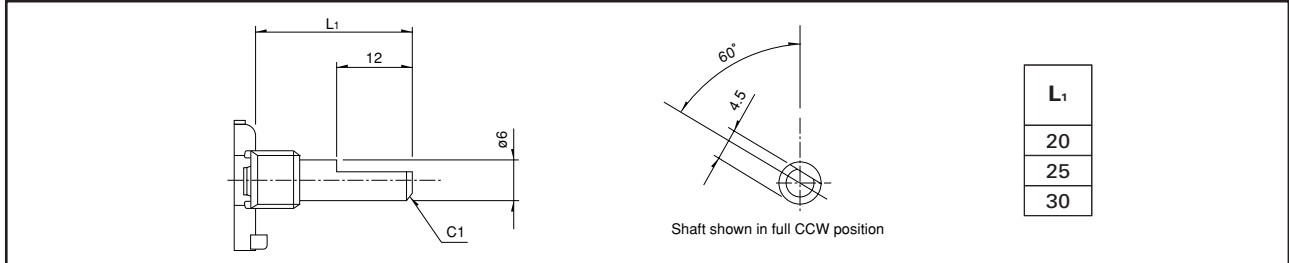
Total resistance (kΩ)	10	20	50	100
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Resistance Taper

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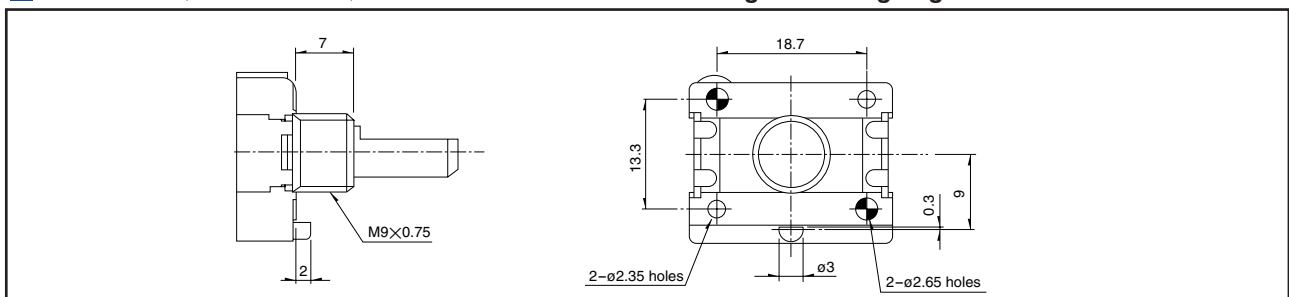
16mm Size (RK168 Series) Shaft Variety

Unit:mm



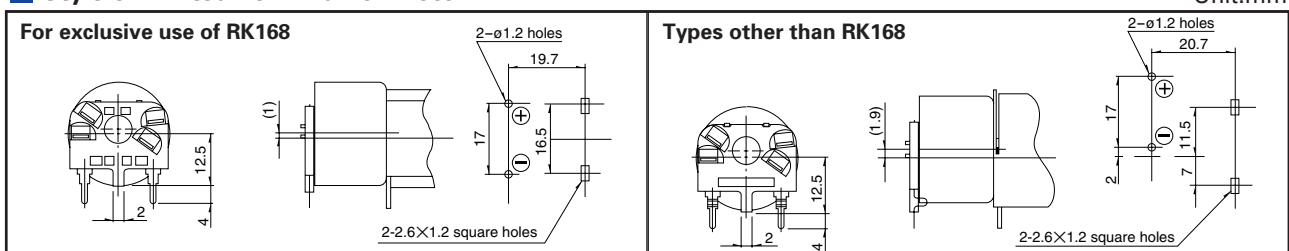
16mm Size (RK168 Series) Standard Dimensions of Bushing and Fixing Lug

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

Push-on Switch Specifications

Items	RK097		RK117		RK119	
Contact arrangement	Single pole and single throw (Push on)					
Travel (mm)	0.5	1.5	0.5	1.5	0.5 ± 0.3	1.5 ± 0.5
Operating force (N)	4 ± 4	5 ± 2	6 ± 3	5 ± 2		4 ± 2
Rating	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)
Contact resistance	100mΩ for initial period; 200mΩ after operating life					
Operating life	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	
Items						
Operating temperature range		-30°C to +80°C	-10°C to +105°C	-10°C to +70°C		
Electrical performance	Total resistance tolerance	±20%				
	Rated power	0.05W	0.06W	0.05W	0.1W	
	Maximum operating voltage	50V AC 30V DC	20V DC	30V AC	150V AC	
	Residual resistance	_____		R ≤ 10kΩ 20Ω max. 10kΩ < R ≤ 50kΩ 30Ω max. 50kΩ < R 0.1% or less of nominal total resistance	_____	
	Maximum attenuation (Volume control)	_____		5kΩ ≤ R < 10kΩ 70dB min. 10kΩ ≤ R < 50kΩ 80dB min. 50kΩ ≤ R < 100kΩ 90dB min. 100kΩ ≤ R 100dB min.	120dB min.	
	Insulation resistance	100MΩ min. 250V DC		100MΩ min. 500V DC		
	Voltage proof	300V AC (for 1minute)		500V AC (for 1minute)		
Mechanical performance	Total rotational angle	240° max.	360°	300±3° Motor-driven 300±5°	300±3°	
	Rotational torque (mN·m)	Shall be in accordance with individual specifications.	20 to 80	8 to 35 Motor-driven 15 to 45	13 to 43	
	Stopper strength (N·m)	0.5	_____	0.9	1.5	
	Push-pull strength	100N max.			150N 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				
	Solder heat resistance	Manual soldering	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 ^{±1} s
		Dip soldering	260±5°C, 5±1s	260°C max., 5s max.	_____	260±5°C, 5±1s
Reflow soldering		_____				
Endurance	Operating life	30,000cycles	15,000cycles			
Environmental performance	Cold	-40±2°C for 192h	-30±3°C for 96h	-30±3°C for 96h	-20±3°C for 240h	
	Dry heat	85±2°C for 192h	105±2°C for 240h	70±2°C for 96h	70±2°C for 240h	
	Damp heat	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
RK09L RK168 RK097 RK203	M9		
RK271	M8		
RK097 RK098 RK163	M7		
RK097 RK098	M6		

Rotary Potentiometers

Slide Potentiometers

Multi Control Devices

Sensors

Metal Shaft

Insulated Shaft

Hollow Type

Knob Operating