

# Rotary Motor-driven Potentiometer

Available in a variety of models, for remote controls for various equipment.

Rotary Potentiometers

Slide Potentiometers

Trimmer Potentiometers

Multi Control Devices

Position Sensors



## Features

- Remote-controllable potentiometers for various audio products.
- Supports motor driving and manual operation.
- The small build-in DC motor enables axis rotation with a high-speed follow-up of 300° per second. (RK25T)
- Good manual operation feel. (RK25T)
- For servo track+touch sensitivity applications, an audio track combination is also available. (RK25T)

## Applications

- Volume control in amplifiers, CD players, karaoke, etc.
- Various controls for professional audio equipment such as mixing console and guitar amplifiers (RK25T)

## Typical Specifications

Items	Specifications		
	RK16	RK27	RK25
Total resistance tolerance	±20%		
Maximum operating voltage	50V AC	30V AC	5V DC
Total rotational angle	300±5°		
Rotational torque	15 to 45 mN·m		0.5 to 7.5 mN·m
Operating life	15,000 cycles		100,000 cycles
Operating temperature range	-10°C to +70°C		-10°C to +60°C
Motor voltage	4 to 6 (Standard : 4.5) V DC		4.5 to 5.5 (Standard : 5) V DC
Potentiometer rotational speed (sec/300°)	12±3 (4.5V DC)		1max. (5V DC)
max. operating current	At rotation : 100 mA At end slip : 150 mA		2,000 mA

## Note

For products ready for use with RoHS, contact our sales division.

Metal Shaft

Insulated Shaft

Knob Operating

## Recommended Products List

Type	Model	Number of resistor elements	Products No.	Shaft type	Length of the shaft (mm)	Total resistance (kΩ)	Resistance taper	Illumination function	Motor print terminal	Minimum packing unit (pcs.)	Drawing No.
16mm size	RK1681□MG0	Dual-unit	RK16812MG099	Flat	25	100	3B	Without	With	200	1
		Quad-unit	RK16814MG02Z						Without		2
		6 ganged-unit	RK16816MGA04						With		3
	RK1681□MGL	Dual-unit	RK16812MGL2K					With (Red)	Without		4
25mm size	RK25T	Single-unit	RK25T11M0001		20	10	1B	Without	With	210	5
27mm size	RK27112MC0	Dual-unit	RK27112MC030		25	100	15A	Without	Without	150	6

## Product Specifications

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					
16mm size illuminated, through-shaft type	Single-shaft, dual-unit	RK16812MGL					
	Single-shaft, quad.-unit	RK16814MGL					
	Single-shaft, 5-ganged-unit	RK16815MGL					
27mm size	Single-shaft, dual-unit	RK27112MC					
	Single-shaft, quad.-unit	RK27114MC					
25mm size	Single-shaft, single-unit	RK25T11M0	Not available	With	5V DC	1sec/300°	2000mA

### Total Resistance Variety

Total resistance (kΩ)	10	20	50	100

### Resistance Taper

Resistance taper	15A	3B

For other detailed specifications, see P.48, 49  
For resistance taper, see P.226

# Rotary Motor-driven Potentiometer

## Dimensions

Unit : mm

No.	Model	Style	PC board mounting hole dimensions (Viewed from mounting side)
1	16mm size Single-shaft, dual-unit RK16812MG	<p>Technical drawing showing side and front views of the RK16812MG potentiometer. Dimensions include: (44.9), (18.1), 23.25, 7, 12, 25, 13.3, 18.7, 25, 0.3, 9, 12.5, 13.2, 4, 0.8, 2-<math>\phi</math>2.65, <math>\phi</math>3, 60°, 4.5, <math>\phi</math>6, M9x0.75, 2-<math>\phi</math>2.35, R1, R2, C1, <math>\phi</math>25 max.</p> <p>Shaft shown in full CCW position</p>	<p>PC board mounting hole dimensions (Viewed from mounting side): 2-2.6x1.2 square holes, Mounting surface, 19.7, 15.5, 7.5, 2.5, 12.5, 17.5, 17, 16.5, COM, 2-<math>\phi</math>1.2 holes, 8-<math>\phi</math>1 holes, 2-dummy, R1 ① ② ③, R2 1 2 3</p>
2	16mm size Single-shaft, quad-unit RK16814MG	<p>Technical drawing showing side and front views of the RK16814MG potentiometer. Dimensions include: (49.25), (18.1), 27.6, 7, 12, 25, 13.3, 18.7, 25, 0.3, 9, 12.5, 13.2, 4, 0.8, 2-<math>\phi</math>2.65, <math>\phi</math>3, 60°, 4.5, <math>\phi</math>6, M9x0.75, 2-<math>\phi</math>2.35, R3 R1, R4 R2, C1, <math>\phi</math>25 max.</p> <p>Shaft shown in full CCW position</p>	<p>PC board mounting hole dimensions (Viewed from mounting side): 2-2.6x1.2 square holes, Mounting surface, 12.3, 7.5, 7.5, 2.5, 12.5, 17.5, 16.5, COM, 4-dummy, 16-<math>\phi</math>1 holes, R1 R3 ① ② ③, R2 R4 1 2 3</p>
3	16mm size Single-shaft, triple-unit RK16816MG	<p>Technical drawing showing side and front views of the RK16816MG potentiometer. Dimensions include: (53.6), (18.1), 31.95, 7, 12, 25, 13.3, 18.7, 25, 0.3, 9, 12.5, 13.2, 4, 0.8, 2-<math>\phi</math>2.65, <math>\phi</math>3, 60°, 4.5, <math>\phi</math>6, M9x0.75, 2-<math>\phi</math>2.35, R5 R3 R1, R6 R4 R2, C1, <math>\phi</math>25 max.</p> <p>Shaft shown in full CCW position</p>	<p>PC board mounting hole dimensions (Viewed from mounting side): 2-2.6x1.2 square holes, Mounting surface, 4.35, 19.7, 12.3, 7.5, 7.5, 2.5, 12.5, 17.5, 17, 16.5, COM, 2-<math>\phi</math>1.2 holes, 6-dummy, 24-<math>\phi</math>1 holes, R1 R3 R5 ① ② ③, R2 R4 R6 1 2 3</p>
4	16mm size Single-shaft, dual-unit Illuminated, through-shaft type RK16812MGL	<p>Technical drawing showing side and front views of the RK16812MGL potentiometer. Dimensions include: (44.9), (18.1), 23.25, 7, 12, 25, 13.3, 18.7, 25, 0.3, 9, 12.5, 13.2, 4, 0.8, 2-<math>\phi</math>2.65, <math>\phi</math>3, 60°, 4.5, <math>\phi</math>6, M9x0.75, 2-<math>\phi</math>2.35, R1, R2, LED, C1, <math>\phi</math>25 max.</p> <p>Shaft shown in full CCW position</p>	<p>PC board mounting hole dimensions (Viewed from mounting side): 2-2.6x1.2 square holes, Mounting surface, 15.5, 4.2, 3.3, 2.5, 12.5, 17.5, 16.5, COM, 10-<math>\phi</math>1 holes, 2-dummy, R1 ① ② ③, R2 1 2 3</p>

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Metal Shaft  
Insulated Shaft  
Knob Operating

## Dimensions

Unit : mm

No.	Model	Style	PC board mounting hole dimensions (Viewed from mounting side)
5	25mm size Single-shaft, Single-unit RK25T11M0		
6	27mm size Single-shaft, dual-unit RK27112MC		

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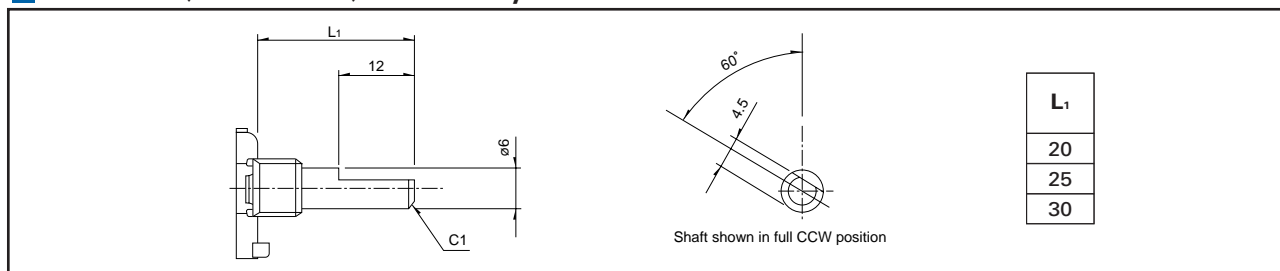
Metal Shaft

Insulated Shaft

Knob Operating

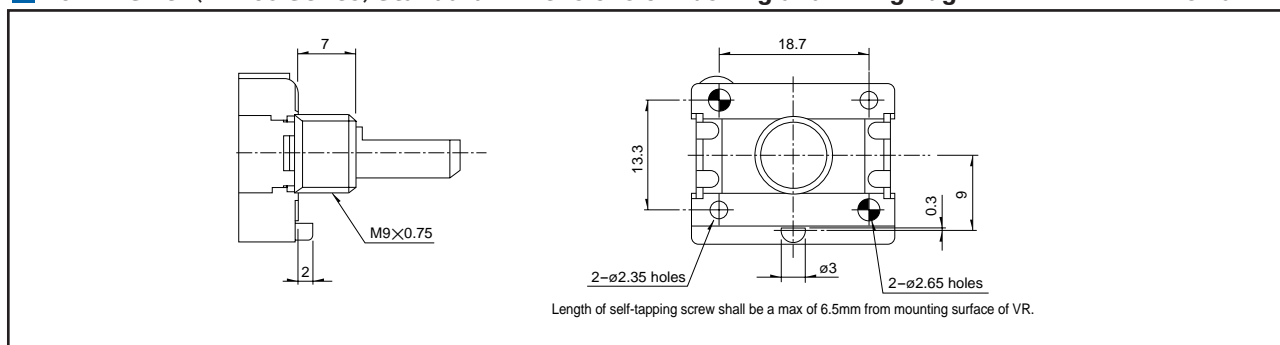
## 16mm Size (RK168 Series) Shaft Variety

Unit : mm



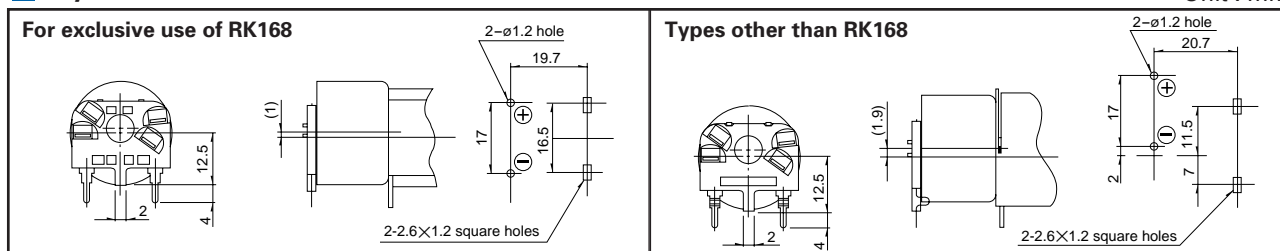
## 16mm Size (RK168 Series) Standard Dimensions of Bushing and Fixing Lug

Unit : mm



## Style of Printed Terminal for Motor

Unit : mm



## Products Specifications

Items		Model	RK09L	RK097 RK098	RK117	RK16
<b>Operating temperature range</b>		-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				150V AC
	<b>Residual resistance</b>	$R \leq 10k\Omega$ 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>	$5k\Omega \leq R < 10k\Omega$ 70dB min. $10k\Omega \leq R < 50k\Omega$ 80dB min. $50k\Omega \leq R < 100k\Omega$ 90dB min. $100k\Omega \leq R$ 100dB min.				
	<b>Insulation resistance</b>	100MΩ min. 250V DC				100MΩ min. 500V DC
	<b>Voltage proof</b>	1 minute 300V AC				1 minute 500V AC
<b>Mechanical performance</b>	<b>Total rotational angle</b>	RK09L $300 \pm 5^\circ$ RK097 $300 \pm 5^\circ$ (Axis movement type is $300 \begin{smallmatrix} +10^\circ \\ -5^\circ \end{smallmatrix}$ ) RK098 $300 \begin{smallmatrix} +10^\circ \\ -5^\circ \end{smallmatrix}$			$300 \begin{smallmatrix} +10^\circ \\ -5^\circ \end{smallmatrix}$	$300 \pm 5^\circ$
	<b>Rotational torque</b>	2 to 25mN·m				
	<b>Stopper strength</b>	0.5N·m (For shaft movable type, 0.4N·m)				0.9N·m (For dual-shaft type, 0.6N·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>Solderability</b>	230±5°C, 3±0.5s				
	<b>Solder heat resistance</b>	<b>Manual soldering</b>	350°C or less and within 3 seconds			
<b>Dip soldering (Dip available products)</b>		260±5°C 4±1s				
<b>Endurance</b>	<b>Operating life</b>	15,000 cycles				
<b>Environmental test</b>	<b>Cold</b>	-10°C for 96h				
	<b>Long-term heat resistance</b>	+70°C for 96h				
	<b>Moisture resistance</b>	+40±2°C, 90 to 95%RH for 96h				

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## Products Specifications

Items		Model	RK20B	RK25T	RK271	RK501
<b>Operating temperature range</b>			-10°C to +105°C	-10°C to +60°C	-10°C to +70°C	
<b>Electrical performance</b>	<b>Total resistance tolerance</b>		±20%			
	<b>Rated power</b>		0.06W	0.05W		0.1W
	<b>Maximum operating voltage</b>		20V DC	5V 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>		1 minute 300V AC		1 minute 500V AC	
<b>Mechanical performance</b>	<b>Total rotational angle</b>		360°	300±5°	300±3°	
	<b>Rotational torque (mN·m)</b>		20 to 80	0.5 to 7.5	5 to 35	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>Solderability</b>		230±5°C, 3±0.5s			
	<b>Solder heat resistance</b>	<b>Manual soldering</b>		350°C or less and within 3 seconds		
<b>Dip soldering (Dip available products)</b>			260±5°C 4±1s			
<b>Endurance</b>	<b>Operating life</b>		15,000 cycles	100,000 cycles	15,000 cycles	
<b>Environmental test</b>	<b>Cold</b>		-10°C for 96h			
	<b>Long-term heat resistance</b>		+105°C for 96h	+70°C for 96h		
	<b>Moisture resistance</b>		+40±2°C, 90 to 95%RH for 96h			

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## Attached Parts

These parts are attached to the following products.

Unit : mm

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

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