


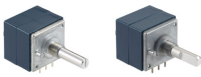


Potentiometers

Rotary Potentiometer (Metal shaft type)

List of Varieties

Series		RK09L	RK097	RK163	RK271
Photo					
Dimensions		9mm Size		16mm Size	27mm Size
Attached switch		Without	Without Rotary switch Push-on switch	Without	Without
Control part orientation	Horizontal	●	●	●	●
	Vertical	●	—	—	—
Number of operating shafts		Single-shaft	Dual shaft (Outer-shaft, Inner shaft) Single-shaft	Single-shaft	
Number of resistor elements		Dual-unit Single-unit			
Shaft types		Flat		Flat Serrated	Flat Slotted
Length of the shaft (mm)		15 20 25		15 20	20 25
Detent		Center detent Without			31-position Without
Operating temperature range		-10°C to +70°C	-20°C to +70°C	-10°C to +70°C	
Operating life (cycles)		15,000			
Electrical performance	Total resistance	10kΩ			100kΩ
	Resistance taper	1B 15A			15A
	Total resistance tolerance	±20%			
	Rated power	0.05W		0.05W 0.1W	0.05W
	Maximum operating voltage	50V AC, 10V DC		150V AC, 5V DC	30V AC
	Residual resistance	20Ω max.			100Ω max.
	Insulation resistance	100MΩ min. 250V DC		100MΩ min. 500V DC	
Voltage proof	300V AC for 1 minute		500V AC for 1 minute		
Mechanical performance	Total rotational angle	300° ±5°	300° ±5° 300° (+10, -5)°	300° ±3°	
	Rotational torque	2 to 25mN·m		3 to 25mN·m	8 to 35mN·m
	Stopper strength	0.5N·m	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			
Automotive		—	—	—	—

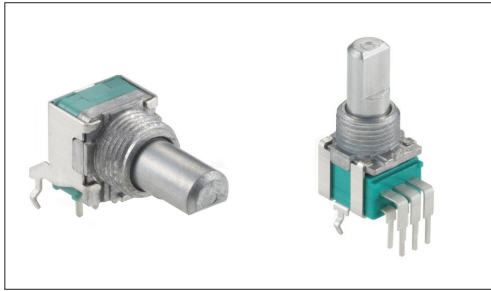
⚠ Note

● Indicates applicability to all products in the series, while ○ indicates applicability to some products in the series.

Potentiometers Rotary Potentiometer (Metal shaft type)

9mm Size Metal Shaft Snap-in Type RK09L Series

Wide variety of single- or dual-gang options, ideal for various control applications.



- Total resistance tolerance: $\pm 20\%$
- Maximum operating voltage: 50V AC, 10V DC
- Rotational torque: 2 to 25mN·m
- Operating life: 15,000 cycles
- Operating temperature range: -10°C to $+70^{\circ}\text{C}$

Applications: Home: Major home appliances, Office equipment
Audio_TV: Visual, Audio, Pro audio

■ Product List

Products No.	Number of resistor elements	Control part orientation	Shaft types	Length of the shaft (mm)	Detent	Total resistance	Resistance taper	Automotive	Drawing No.
RK09L1120A5F	Single-unit	Horizontal	Flat	15	Without	10k Ω	1B	—	1
RK09L1120036	Single-unit	Horizontal	Flat	15	Center detent	10k Ω	1B	—	
RK09L1120A0Z	Single-unit	Horizontal	Flat	20	Without	10k Ω	1B	—	2
RK09L112003S	Single-unit	Horizontal	Flat	20	Center detent	10k Ω	1B	—	
RK09L1140A5L	Single-unit	Vertical	Flat	15	Without	10k Ω	1B	—	3
RK09L114001E	Single-unit	Vertical	Flat	15	Center detent	10k Ω	1B	—	
RK09L1140A2U	Single-unit	Vertical	Flat	20	Without	10k Ω	1B	—	4
RK09L114001T	Single-unit	Vertical	Flat	20	Center detent	10k Ω	1B	—	
RK09L122002H	Dual-unit	Horizontal	Flat	15	Center detent	10k Ω	1B	—	5
RK09L122002L	Dual-unit	Horizontal	Flat	25	Center detent	10k Ω	1B	—	6
RK09L12B0A4S	Dual-unit	Horizontal	Flat	15	Without	10k Ω	15A	—	5
RK09L12B0A1V	Dual-unit	Horizontal	Flat	25	Without	10k Ω	15A	—	6
RK09L1240015	Dual-unit	Vertical	Flat	15	Center detent	10k Ω	1B	—	7
RK09L1240019	Dual-unit	Vertical	Flat	20	Center detent	10k Ω	1B	—	8
RK09L12D0A1W	Dual-unit	Vertical	Flat	15	Without	10k Ω	15A	—	7
RK09L12D0A1T	Dual-unit	Vertical	Flat	20	Without	10k Ω	15A	—	8

⚠ Note

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. Please place purchase orders per minimum order unit (integer).
3. Products other than those listed in above products are also available. Please contact us for details.

■ Packing Specifications

Tray

Number of packages (pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
1,000	2,000	479 x 369 x 181

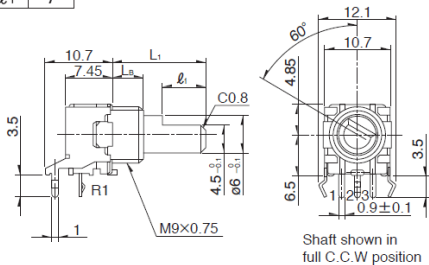
9mm Size Metal Shaft Snap-in Type
RK09L Series

Drawing No.1

■ Dimensions

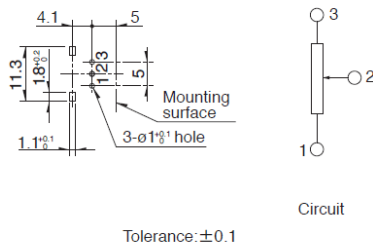
L ₁	15
L _B	5
l ₁	7

Unit:mm



■ Mounting Hole Dimensions

Unit:mm



Tolerance: ±0.1

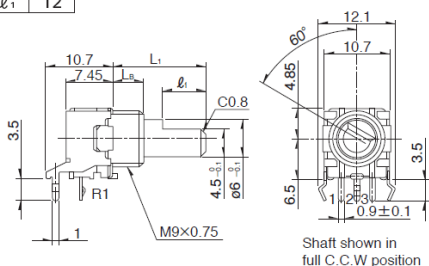
Viewed from mounting side.

Drawing No.2

■ Dimensions

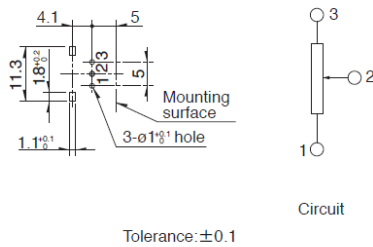
L ₁	20
L _B	7
l ₁	12

Unit:mm



■ Mounting Hole Dimensions

Unit:mm



Tolerance: ±0.1

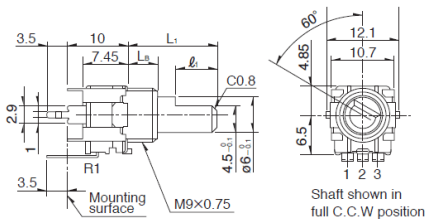
Viewed from mounting side.

Drawing No.3

■ Dimensions

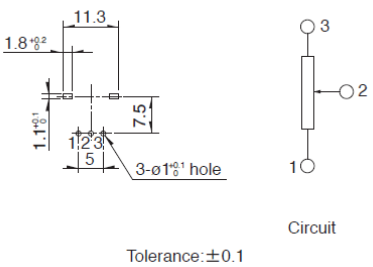
L ₁	15
L _B	5
l ₁	7

Unit:mm



■ Mounting Hole Dimensions

Unit:mm



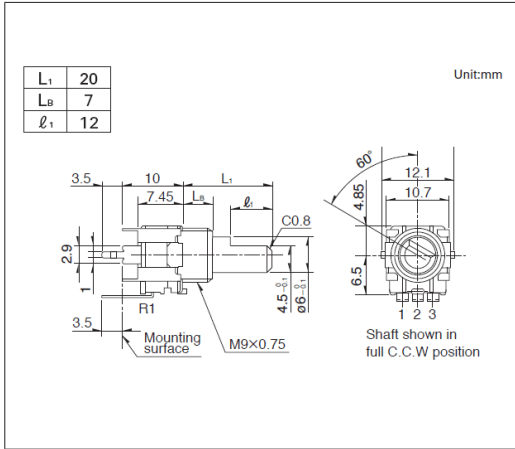
Tolerance: ±0.1

Viewed from mounting side.

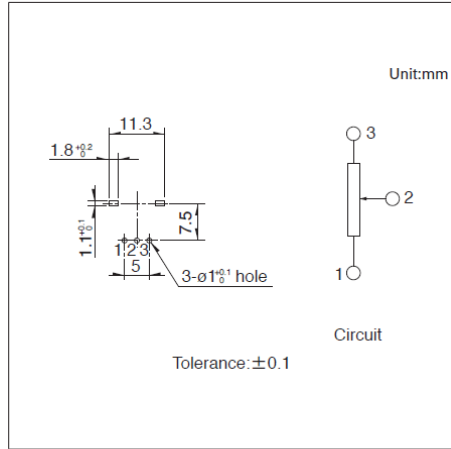
9mm Size Metal Shaft Snap-in Type
RK09L Series

Drawing No.4

■ Dimensions



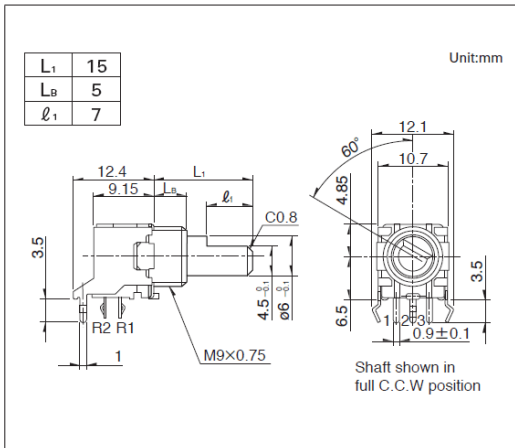
■ Mounting Hole Dimensions



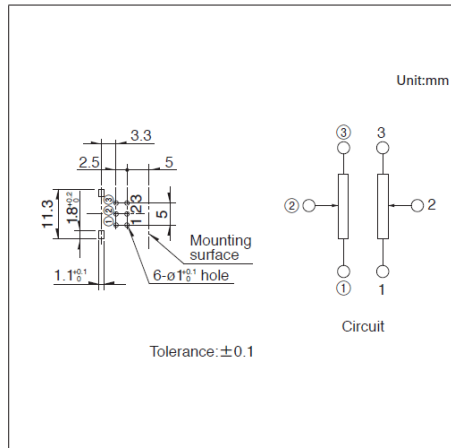
Viewed from mounting side.

Drawing No.5

■ Dimensions



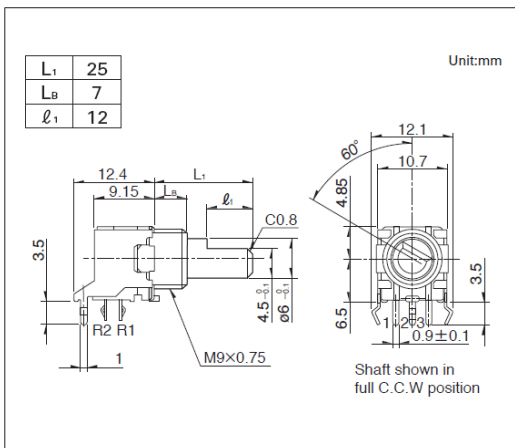
■ Mounting Hole Dimensions



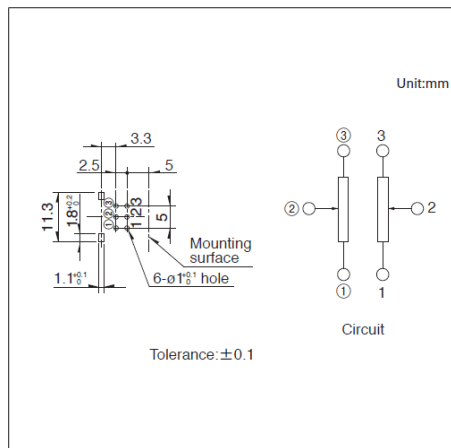
Viewed from mounting side.

Drawing No.6

■ Dimensions



■ Mounting Hole Dimensions

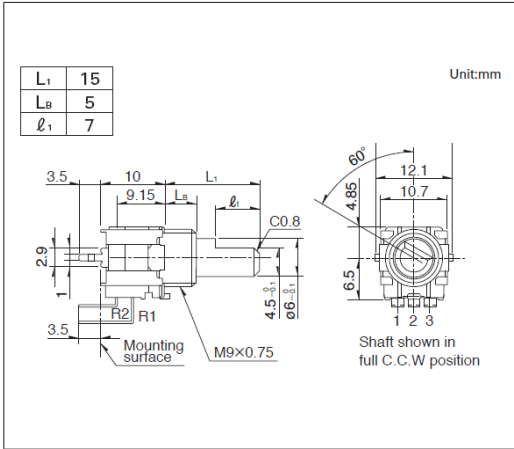


Viewed from mounting side.

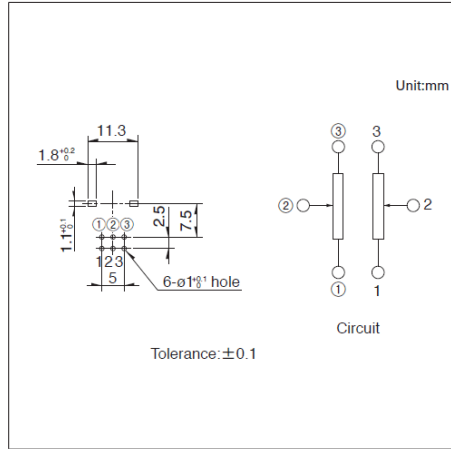
9mm Size Metal Shaft Snap-in Type
RK09L Series

Drawing No.7

■ Dimensions



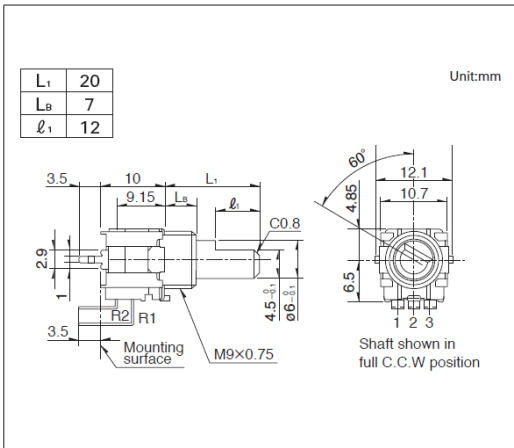
■ Mounting Hole Dimensions



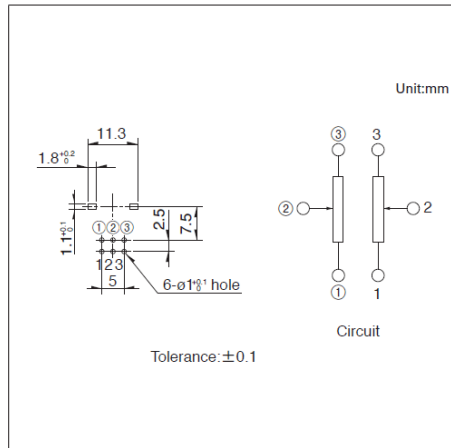
Viewed from mounting side.

Drawing No.8

■ Dimensions



■ Mounting Hole Dimensions

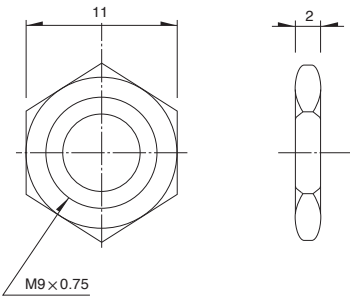
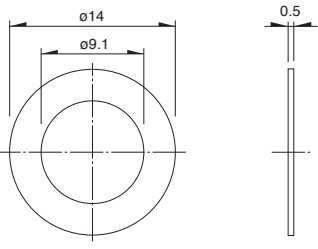


Viewed from mounting side.

9mm Size Metal Shaft Snap-in Type / Attached Parts

The following parts are included with the product.

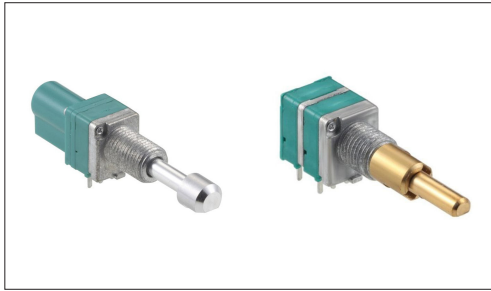
Unit:mm

Nut	Washer
 <p>M9x0.75</p>	

Potentiometers Rotary Potentiometer (Metal shaft type)

9mm Size Metal Shaft Multi-ganged Type RK097 Series

Compact type with a 9.5mm body width, suitable for a broad range of control applications.



- Total resistance tolerance: $\pm 20\%$
- Maximum operating voltage: 50V AC, 10V DC
- Rotational torque: 2 to 25mN·m
- Operating life: 15,000 cycles
- Operating temperature range: -20°C to $+70^{\circ}\text{C}$

Applications: Home: Major home appliances, Office equipment
Audio_TV: Visual, Audio, Pro audio

Product List

Products No.	Type	Number of resistor elements	Control part orientation	Shaft types	Length of the shaft (mm)	Detent	Total resistance	Resistance taper	Automotive	Drawing No.
RK097111080R	Single-shaft without switch type	Single-unit	Horizontal	Flat	20	Without	10k Ω	15A	—	1
RK0971110D88		Single-unit	Horizontal	Flat	20	Center detent	10k Ω	1B	—	
RK0971210DBH		Dual-unit	Horizontal	Flat	20	Center detent	10k Ω	1B	—	2
RK09712200HA		Dual-unit	Horizontal	Flat	20	Without	10k Ω	15A	—	
RK09711110EL	Single-shaft with rotary switch type	Single-unit	Horizontal	Flat	20	Without	10k Ω	1B	—	3
RK0971221Z0X		Dual-unit	Horizontal	Flat	20	Without	10k Ω	15A	—	4
RK0971114Z1N	Single-shaft momentary push (0.5mm-travel) switch	Single-unit	Horizontal	Flat	15	Center detent	10k Ω	1B	—	5
RK0971224Z01		Dual-unit	Horizontal	Flat	20	Without	10k Ω	15A	—	6
RK097111T065	Single-shaft with push-lock mechanism type	Single-unit	Horizontal	Flat	25	Without	10k Ω	1B	—	7
RK097111TD2M		Single-unit	Horizontal	Flat	25	Center detent	10k Ω	1B	—	
RK097122T017		Dual-unit	Horizontal	Flat	25	Without	10k Ω	15A	—	8
RK097221005C	Dual-shaft, dual-unit without switch type	Dual-unit	Horizontal	—	—	—	—	—	—	9

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2. Please place purchase orders per minimum order unit (integer).
3. This products can be used in vehicles.
4. Products other than those listed in above products are also available. Please contact us for details.

Packing Specifications

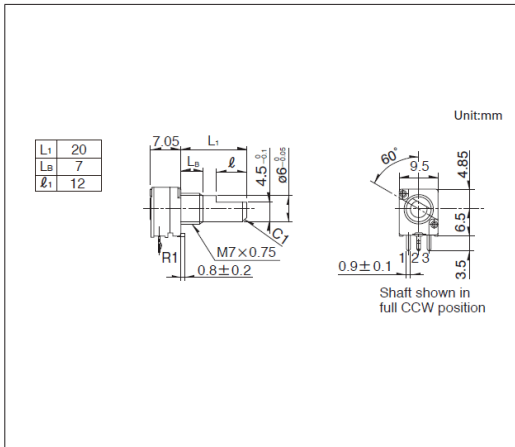
Tray

Products No.	Number of packages(pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
RK097111080R RK0971110D88	1,200	2,400	463 x 375 x 185
RK0971210DBH RK09712200HA	800	1,600	540 x 373 x 207
RK09711110EL RK0971221Z0X RK0971114Z1N RK0971224Z01 RK097111T065 RK097111TD2M RK097221005C	700	1,400	540 x 373 x 181
RK097122T017	600	1,200	540 x 373 x 225

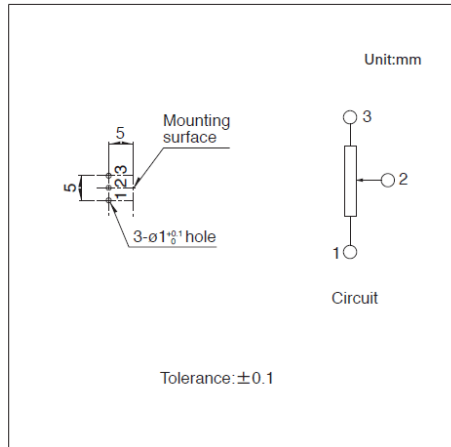
9mm Size Metal Shaft Multi-ganged Type
RK097 Series

Drawing No.1

■ Dimensions



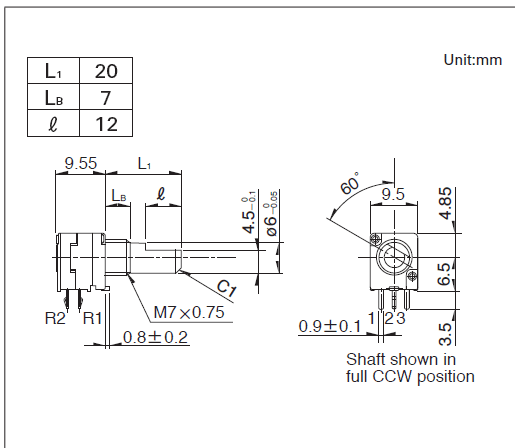
■ Mounting Hole Dimensions



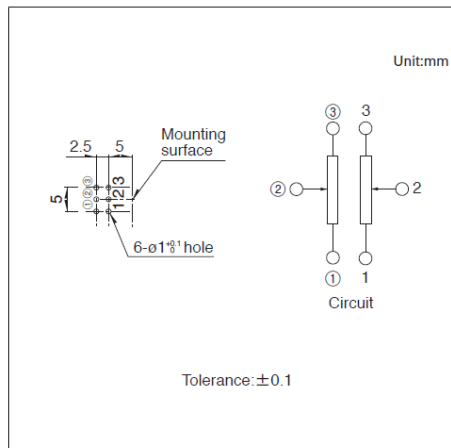
Viewed from mounting side.

Drawing No.2

■ Dimensions



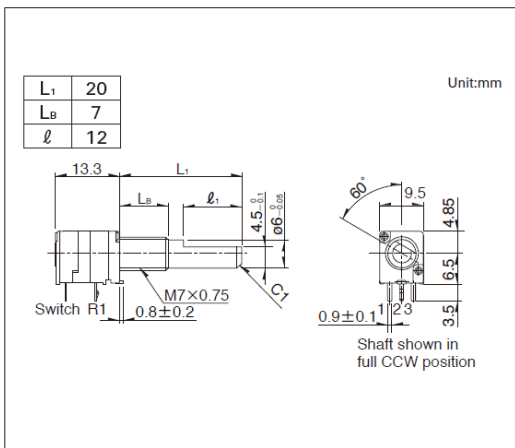
■ Mounting Hole Dimensions



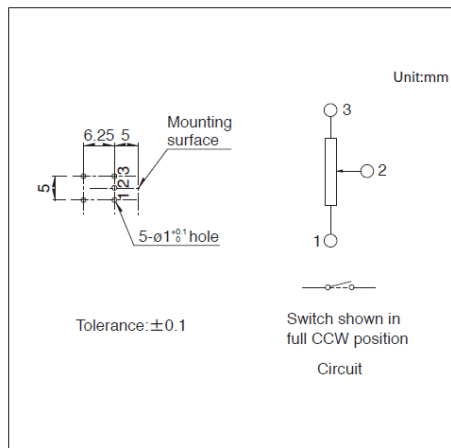
Viewed from mounting side.

Drawing No.3

■ Dimensions



■ Mounting Hole Dimensions

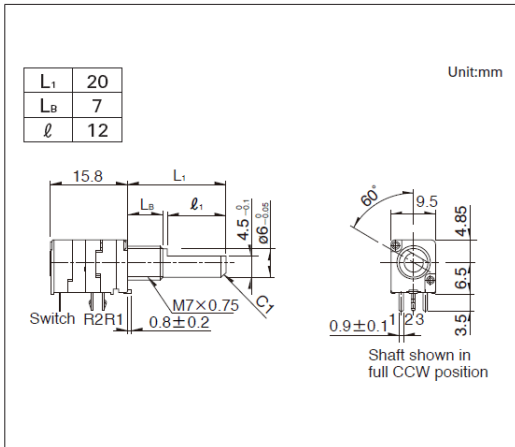


Viewed from mounting side.

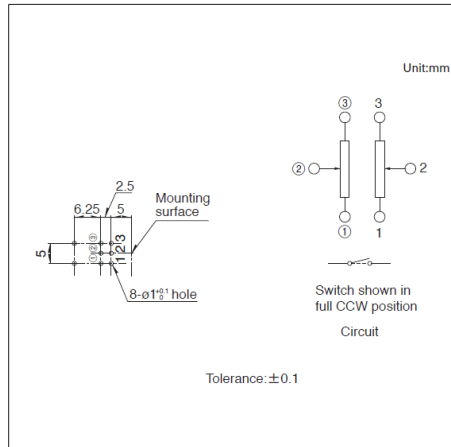
9mm Size Metal Shaft Multi-ganged Type RK097 Series

Drawing No.4

■ Dimensions



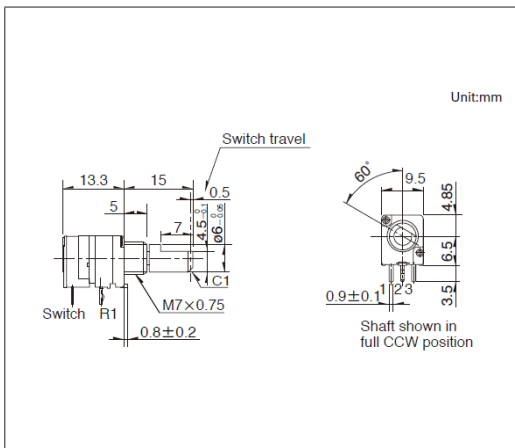
■ Mounting Hole Dimensions



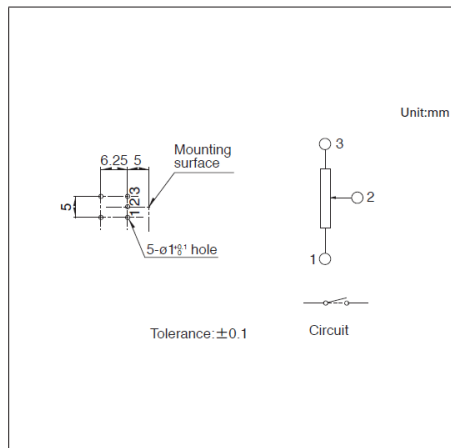
Viewed from mounting side.

Drawing No.5

■ Dimensions



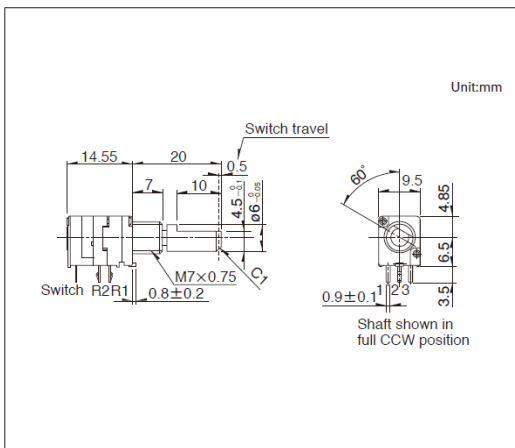
■ Mounting Hole Dimensions



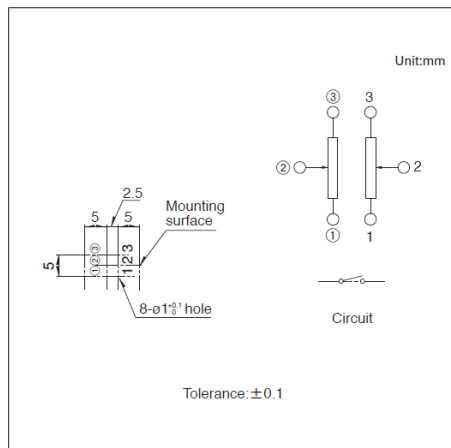
Viewed from mounting side.

Drawing No.6

■ Dimensions



■ Mounting Hole Dimensions

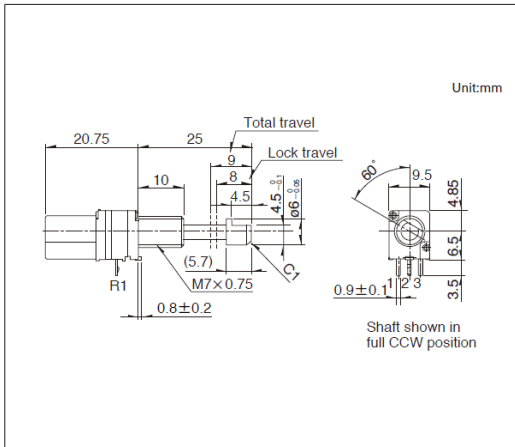


Viewed from mounting side.

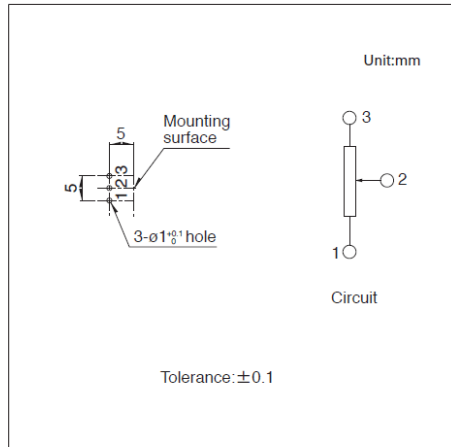
9mm Size Metal Shaft Multi-ganged Type
RK097 Series

Drawing No.7

■ Dimensions



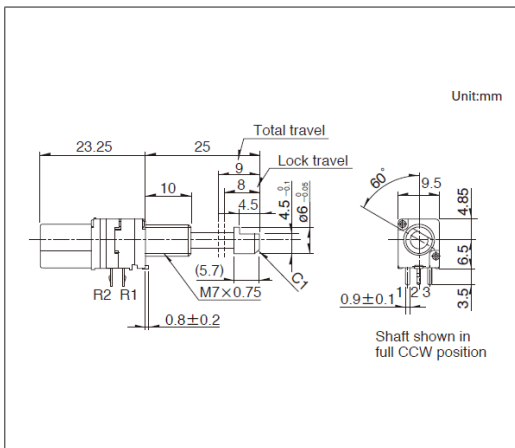
■ Mounting Hole Dimensions



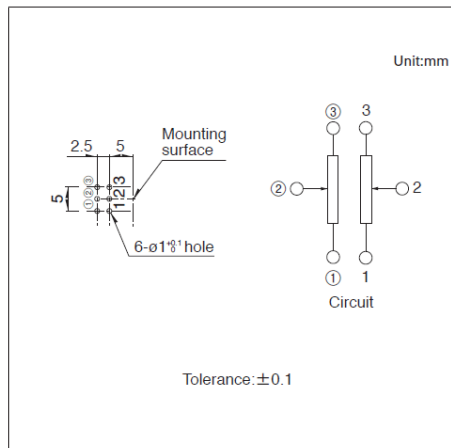
Viewed from mounting side.

Drawing No.8

■ Dimensions



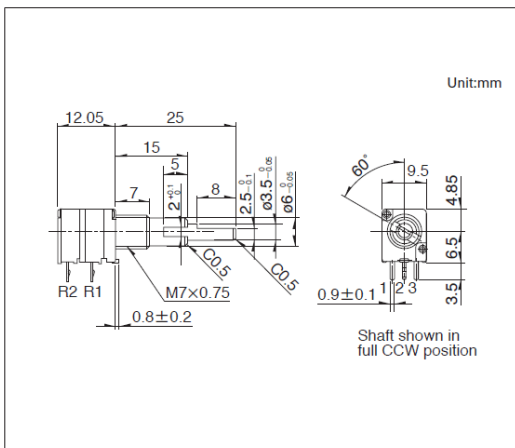
■ Mounting Hole Dimensions



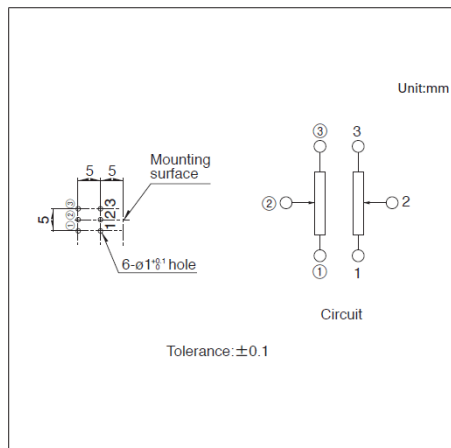
Viewed from mounting side.

Drawing No.9

■ Dimensions



■ Mounting Hole Dimensions



Viewed from mounting side.

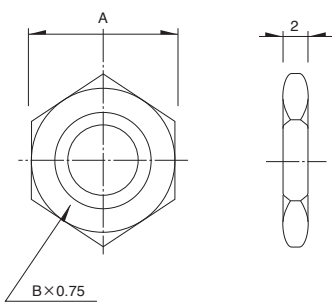
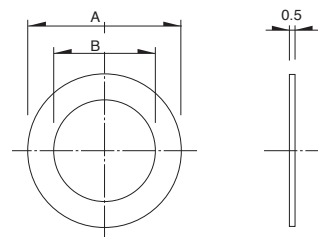
9mm Size Metal Shaft Multi-ganged Type / Switch Specifications

Switch type		Rotary switch	Momentary push switch
Contact arrangement		Single pole and single throw	Single pole and single throw
Travel		50° max.	0.5 $\begin{smallmatrix} +0.7 \\ -0.3 \end{smallmatrix}$ mm
Changeover force		50mN·m max.	4 \pm $\frac{1}{2}$ N
Operating life under load		10,000 cycles	
Electrical performance	Rating	3A 16V DC (10mA 16V DC min. ratings)	0.5A 12V DC (10mA 12V DC min. ratings)
	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.

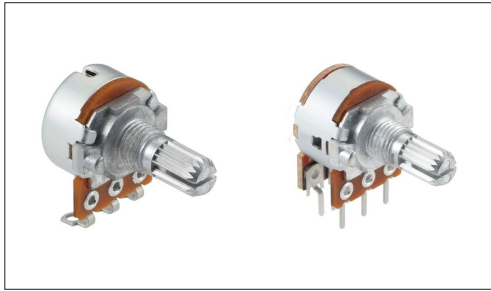
Unit:mm

Nut			Washer		
					
Bearing screw diameter	Dimension		Bearing screw diameter	Dimension	
	A	B		A	B
M7	11	M7	M7	φ12	φ7.2
M9	11	M9	M9	φ14	φ9.1

Potentiometers Rotary Potentiometer (Metal shaft type)

16mm Size Metal Shaft Type RK163 Series

Versatile product specification variety supporting various control needs.



- Total resistance tolerance: $\pm 20\%$
- Maximum operating voltage: 150V AC, 5V DC
- Rotational torque: 3 to 25mN·m
- Operating life: 15,000 cycles
- Operating temperature range: -10°C to $+70^{\circ}\text{C}$

Applications: Home: Major home appliances, Office equipment
Audio_TV: Audio

Product List

Products No.	Number of resistor elements	Control part orientation	Shaft types	Length of the shaft (mm)	Detent	Total resistance	Resistance taper	Automotive	Drawing No.
RK1631110U1Q	Single-unit	Horizontal	Flat	20	Without	10k Ω	1B	—	1
RK1631110TNP	Single-unit	Horizontal	Flat	20	Without	10k Ω	1B	—	2
RK1631110U2A	Single-unit	Horizontal	Serrated	15	Without	10k Ω	1B	—	3
RK1631110U0Q	Single-unit	Horizontal	Serrated	15	Without	10k Ω	1B	—	4
RK16312101A2	Dual-unit	Horizontal	Flat	20	Center detent	10k Ω	1B	—	5
RK1631210AX9	Dual-unit	Horizontal	Serrated	15	Without	10k Ω	1B	—	6
RK16312A0B85	Dual-unit	Horizontal	Flat	20	Without	10k Ω	15A	—	5
RK16312A0BKR	Dual-unit	Horizontal	Serrated	15	Without	10k Ω	15A	—	6

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Packing Specifications

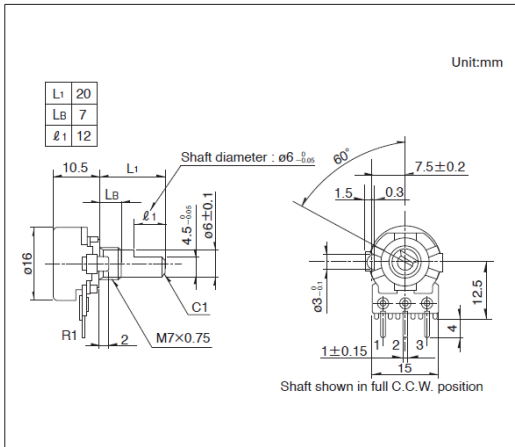
Bulk

Products No.	Number of packages (pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
RK1631110U1Q RK1631110U2A RK16312101A2 RK1631210AX9 RK16312A0B85 RK16312A0BKR	600	1,200	532 x 326 x 386
RK1631110TNP RK1631110U0Q	200	400	360 x 270 x 155

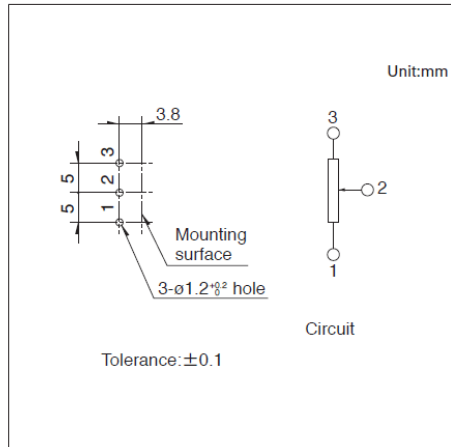
16mm Size Metal Shaft Type
RK163 Series

Drawing No.1

■ Dimensions



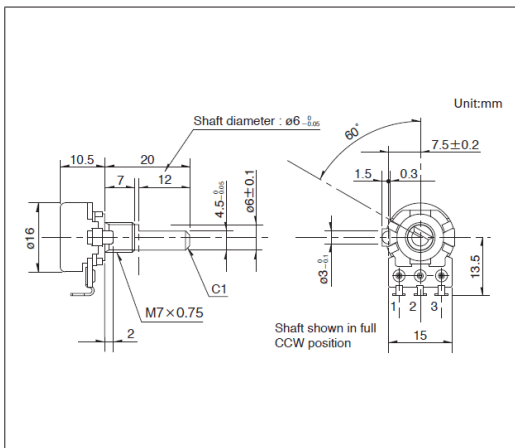
■ Mounting Hole Dimensions



Viewed from mounting side.

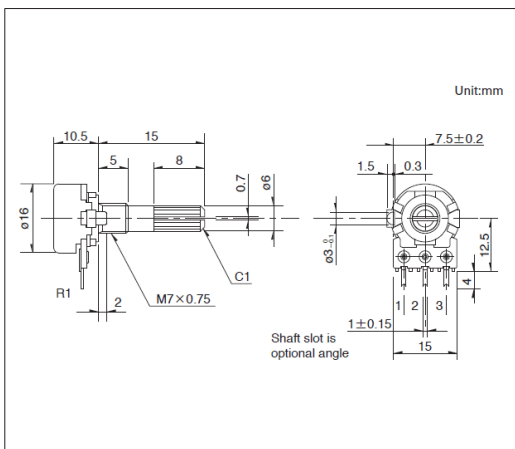
Drawing No.2

■ Dimensions

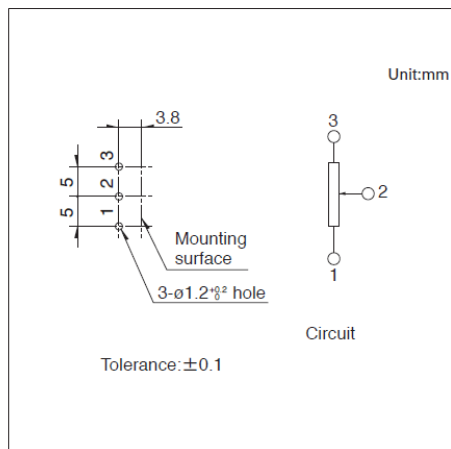


Drawing No.3

■ Dimensions



■ Mounting Hole Dimensions

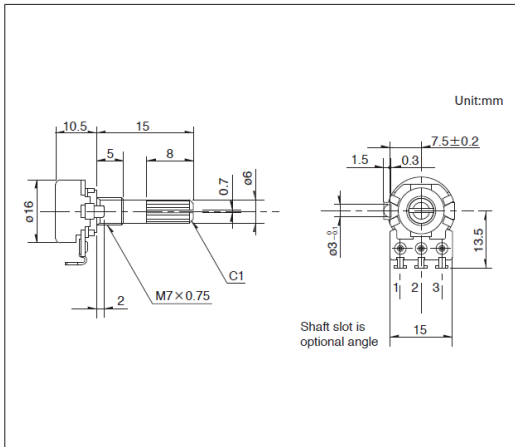


Viewed from mounting side.

16mm Size Metal Shaft Type
RK163 Series

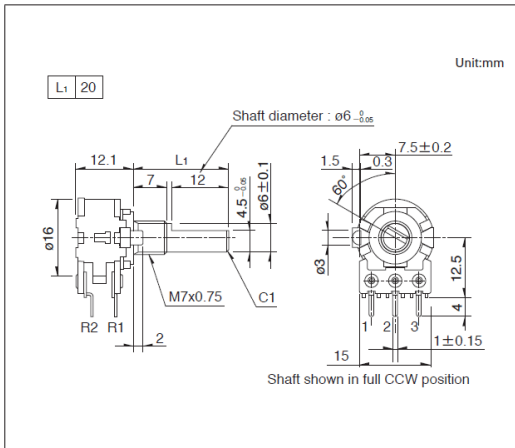
Drawing No.4

■ Dimensions

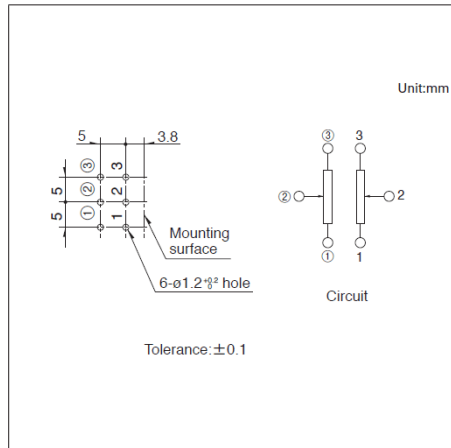


Drawing No.5

■ Dimensions



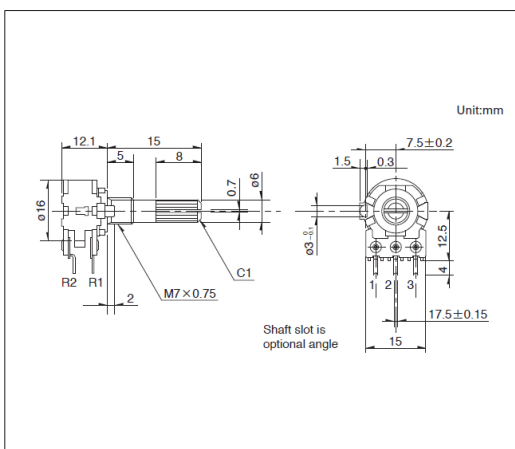
■ Mounting Hole Dimensions



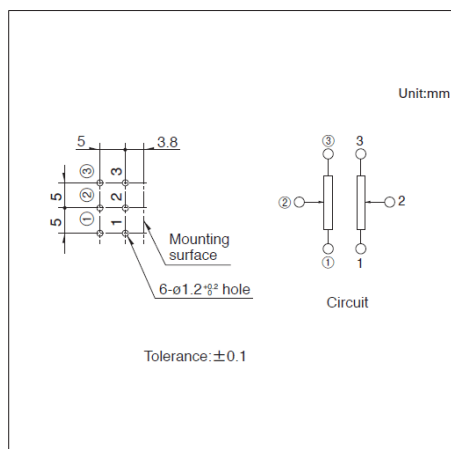
Viewed from mounting side.

Drawing No.6

■ Dimensions



■ Mounting Hole Dimensions

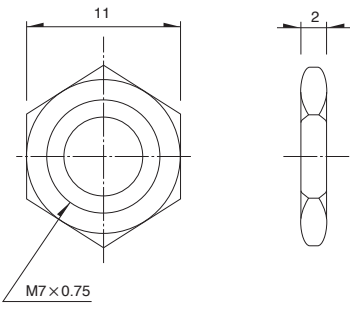
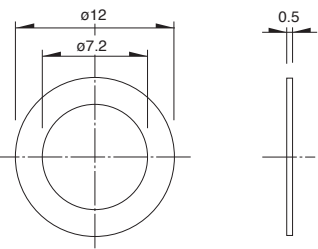


Viewed from mounting side.

16mm Size Metal Shaft Type / Attached Parts

The following parts are included with the product.

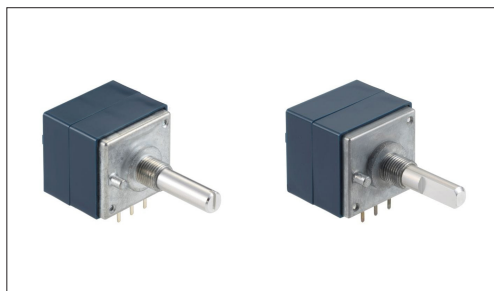
Unit:mm

Nut	Washer
 <p>Technical drawing of a hexagonal nut. The front view shows a hexagonal shape with a diameter of 11 mm. The side view shows a height of 2 mm. The thread specification is M7x0.75.</p>	 <p>Technical drawing of a circular washer. The front view shows an outer diameter of $\phi 12$ mm and an inner diameter of $\phi 7.2$ mm. The side view shows a thickness of 0.5 mm.</p>

Potentiometers Rotary Potentiometer (Metal shaft type)

27mm Size Metal Shaft Type RK271 Series

High-performance volume with excellent operation feel.



- Total resistance tolerance: $\pm 20\%$
- Maximum operating voltage: 30V AC
- Rotational torque: 8 to 35mN·m
- Operating life: 15,000 cycles
- Operating temperature range: -10°C to $+70^{\circ}\text{C}$

Applications: Audio_TV:Audio

■ Product List

Products No.	Number of resistor elements	Control part orientation	Shaft types	Length of the shaft (mm)	Detent	Total resistance	Resistance taper	Automotive	Drawing No.
RK2711120026	Single-unit	Horizontal	Slotted	25	31-position	100k Ω	15A	—	1
RK271111001T	Single-unit	Horizontal	Slotted	25	Without	100k Ω	15A	—	
RK27112A00AK	Dual-unit	Horizontal	Slotted	20	Without	100k Ω	15A	—	2
RK27112A00CC	Dual-unit	Horizontal	Slotted	25	Without	100k Ω	15A	—	3
RK27112A0A16	Dual-unit	Horizontal	Flat	20	Without	100k Ω	15A	—	4
RK27112A00B9	Dual-unit	Horizontal	Flat	25	Without	100k Ω	15A	—	5

⚠ Note

1. This catalog shows only outline specifications. When using the products, please obtain formal specifications for supply.
2. Please place purchase orders per minimum order unit (integer).
3. Products other than those listed in above products are also available. Please contact us for details.

■ Packing Specifications

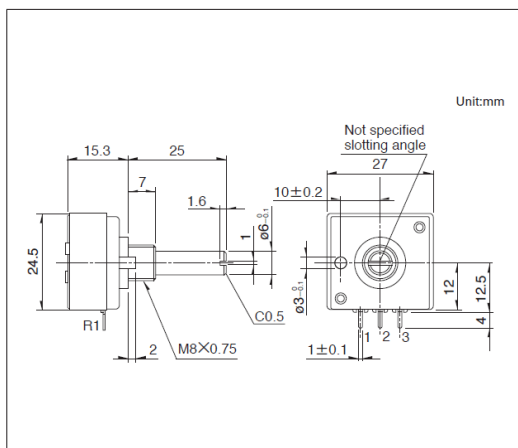
Bulk

Products No.	Number of packages (pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
RK2711120026 RK271111001T RK27112A00AK RK27112A0A16	100	500	540 x 380 x 314
RK27112A00CC RK27112A00B9	100	500	510 x 360 x 359

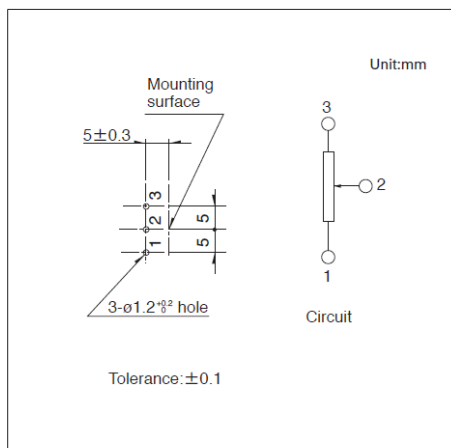
27mm Size Metal Shaft Type
RK271 Series

Drawing No.1

■ Dimensions



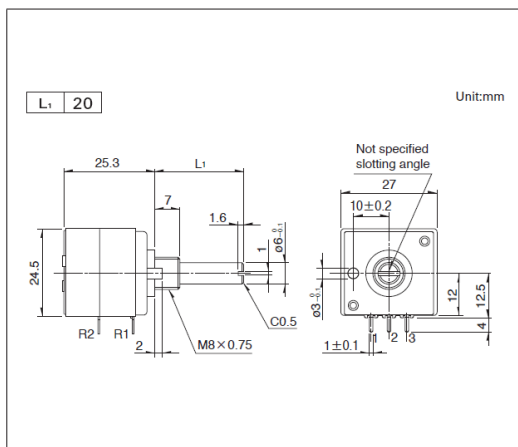
■ Mounting Hole Dimensions



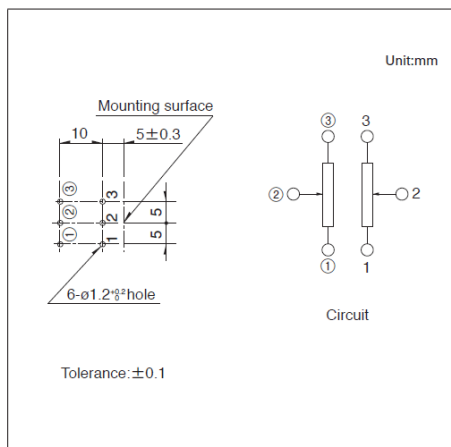
Viewed from mounting side.

Drawing No.2

■ Dimensions



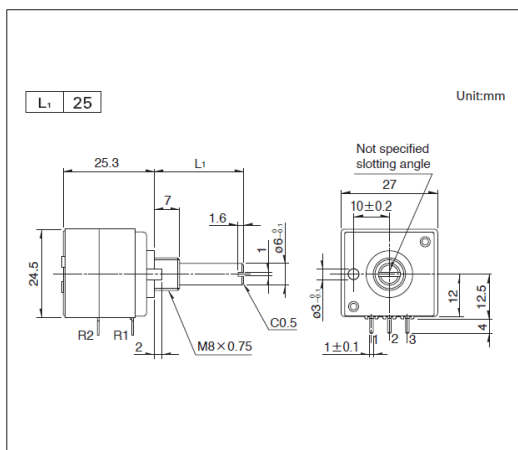
■ Mounting Hole Dimensions



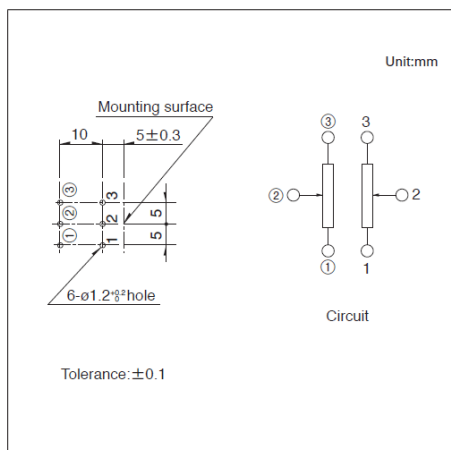
Viewed from mounting side.

Drawing No.3

■ Dimensions



■ Mounting Hole Dimensions

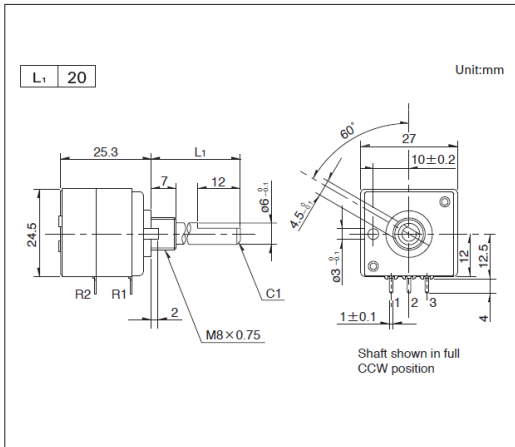


Viewed from mounting side.

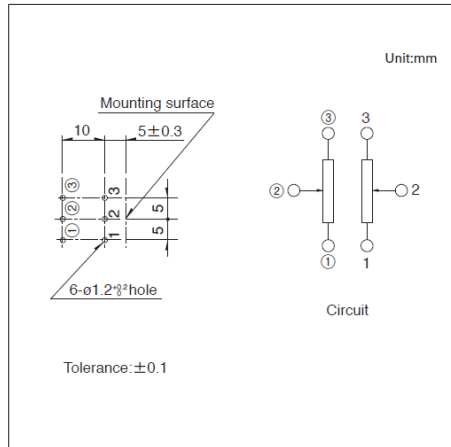
27mm Size Metal Shaft Type
RK271 Series

Drawing No.4

■ Dimensions



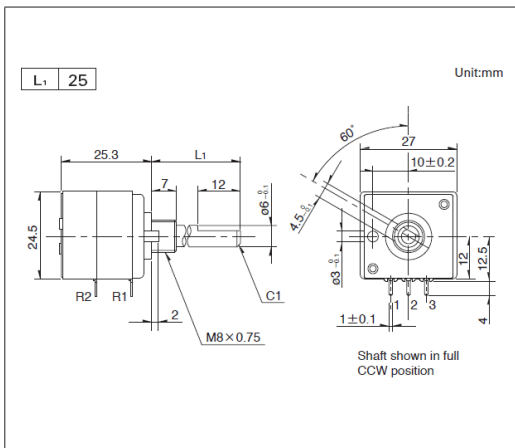
■ Mounting Hole Dimensions



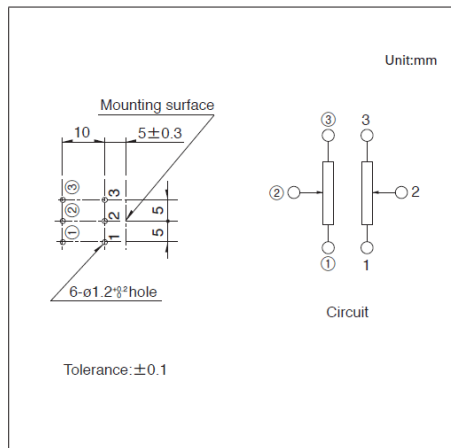
Viewed from mounting side.

Drawing No.5

■ Dimensions



■ Mounting Hole Dimensions

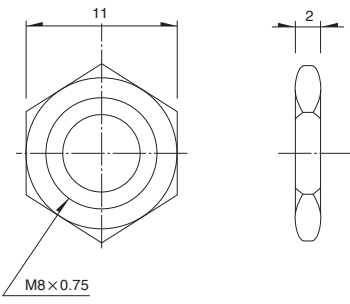
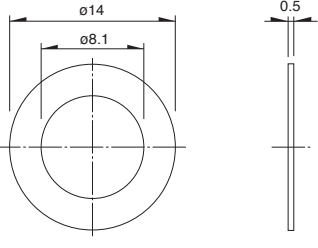


Viewed from mounting side.

27mm Size Metal Shaft Type / Attached Parts

The following parts are included with the product.

Unit:mm

Nut	Washer
 <p>11</p> <p>2</p> <p>M8x0.75</p>	 <p>14</p> <p>8.1</p> <p>0.5</p>

Rotary Potentiometer (Metal shaft type) / Soldering Conditions

■ Reference for Manual Soldering

Series	Tip temperature	Soldering time	No. of solders
RK09L, RK097	350°C max.	3s max.	1 time
RK163, RK271	350°C max.	5s max.	1 time

■ Reference for Dip Soldering

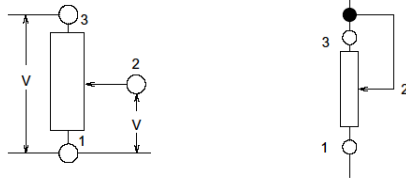
Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
RK09L, RK097	100°C max.	2 min. max.	260±5°C	5±1s	2 times max.

Potentiometers / Cautions

Recommended Circuit Configuration

Please use the potentiometer in the voltage adjustment circuit (Fig. A). Avoid using it in the current adjustment circuit (Fig. B) as it is affected by the contact resistance between the resistive element and the wiper.

A.Voltage divider type B.Current controller type



Direct Voltage

When direct voltage is flown through this part, terminal to terminal insulation may deteriorate depending on the use environment. This is due to a migration phenomenon. Contact us if you are planning to use this part under direct voltage.

Impedance on the Output Side

There is a possibility that might be affected by contact resistance of resistive element and wiper in case of low impedance of output side in voltage regulation circuit. For this reason, we require that you adjust to impedance of output side more than 100 times of total resistance.

Residual Resistance

Although electric poles of resistors are generally formed by silver printing, we provide carbon coating over the silver poles to enhance reliability against sulfurization. Contact us if you wish to use the part in a low residual resistance state.

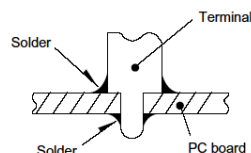
Dew Condensation

Avoid using the potentiometer where dew or water drops might occur on the surface of the resistor, etc. Deterioration of insulation or shorting may occur.

Soldering

To avoid potential contact issues, please do not solder wires to the top surface of the printed circuit board as shown in the diagram.

Solder all metal lugs into a substrate before use.



Stress Being Applied to the Terminals

Always pay special attention not to apply excessive stress when handling the terminals. Also, be sure to design appropriate soldering conditions.

Looseness of the Shaft

When lengthy shaft lengths are being employed, the looseness (deviation) tends to grow in proportion to the shaft length. Conducting a test under actual operating conditions is recommended.

Potentiometers / Cautions

Chassis Mounting

The use of a nut to fasten this part may lead to excessive tightening and can deteriorate the rotary contact performance, or strip the threads. Handle with care when tightening the nut.

Use of Chemicals

Since synthetic resins such as polycarbonate are being used as the material for the insulated type shafts, avoid using this part under gassy environments of such chemicals as ammonia, amines, alkali water solutions, aromatic hydrocarbons, ketones, esters and halogenated hydrocarbons, especially, under their intensive gas environments.

Operation at Low Temperature

When these products are expected to be used under low temperature environments such as applications for car radios and car stereos, we can customize them for easier and more smooth rotary movements. When placing orders, indicate whether the low temperature specification is necessary or not.

Storage

1. Store the products as delivered, at a normal temperature and humidity, without direct sunshine and corrosive gas ambient. Use them at an earliest possible timing, not later than six months upon receipt.
2. After breaking the seal, keep the products in a plastic bag to shut out ambient air, store them in the same environment as above, and use them up as soon as possible.
3. Do not stack too many switches.

The above operation notes are quoted from the "Precaution and Guideline of Potentiometer for Electrical Devices", which is a technical report issued by the Japan Electronics and Information Technology Industries Association RCR-2191A (in March 2002).

For details, see the above technical report.