Customer: ALGE GERMAN DISTRIBUTER

No. LX-2004-2928

Date: Jul. 21, 2004

Attention:

Your ref. No:

Your Part. No: ALBS 402150

SPECIFICATIONS

ALPS';

MODEL RK09L1220 (50k B X2)

Spec. No. :

Sample No. : F1689858M

RECEIPT STATUS
RECEIVED
By Date

Signature

Name

Title

ALPS ELECTRIC CO., LTD.

HEAD OFFICE
1-7, YUKIGAYA-OHTSUKA-CHO,
OHTA-KU, TOKYO 145-8501 JAPAN

DSG'D M. Sato

APP'D S. Sato

Sales

No. LX-2004-2928

SPECIFICATIONS

1.THIS SPECIFICATIONS APPLY TO RK09L1220 POTENTIOMETER.

2.CONTENTS OF THIS SPECIFICATIONS.

F1689858M
K092G000C

3.MARKING

·MARKING ON ALL UNITS
DATE CODE,RESIST. VALUE,TAPER

4.REMARKS

·FURNISH PACKAGE
NUT: 1, WASHER: 1

·CAUTION

Regardless of the suggested applications of these products being introduced in the specifications, when using them for equipment and devices requiring a high degree of safety, respective manufacturers will please preserve safety of the planned equipment and devices by providing necessary protectve circuits and redundancy circuits and reconfirm if safety is being duly preserved.

Products being introduced in the specifications have been designed and manufactured for applications to ordinary electronic equipment and devices such as the AV equipment, electric home appliances, office machines and communications equipment. Consequently, when employing these products for applications requiring a high degree of safety and reliability such as the medical equipment, aviation and aircraft equipment, space equipment and burglar alarm equipment, the using manufacturers will please thoroughly study the proprieties of these products for the planned applications.

Although we are exerting our best efforts to maintain the quality of these products, we cannot guarantee that they will never cause short circuiting and open circuitry.
Therefore, when designing an equipment or device with whitch the priority is given to the safety, you will please carefully study the influences to the whole equipment of a single function failure of Potentiometers and Encoders in advance to make out a fail-safe design providing.

SPECIFICATIONS

ELECTRICAL

1. Total resistance : 50k Ω ±20%
2. Rated power : 0.05 W
3. Rated voltage :

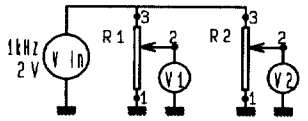
The rated voltage shall be the voltage of D.C. or A.C. (commercial frequency, effective value) corresponding to the rated power (dissipation), and be obtained from the following formula. When the obtained rated voltage exceeds the maximum working voltage given in the following, however, the maximum working voltage of the following shall be the rated voltage.

$$E = \sqrt{P \cdot R} \ (V)$$

Where E : Rated voltage (V)
P : Rated power(dissipation) (W)
R : Nominal total resistance (Ω)

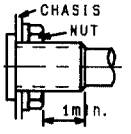
Maximum working voltage : 50 V A.C. , 10 V D.C.

4. Resistance taper : B
5. Residual resistance between terminals 1&2, 2&3 : 50Ω max.
6. Sliding noise : Less than 100mV. (Measured by JIS C 6443)
7. Insulation resistance : More than 100 MΩ at 250V D.C.
8. Withstand voltage: 300V A.C. for 1 mimute.
9. Gang error : 3 dB max. at 150°



MECHANICAL

1. Total rotational angle : 300°±5°
2. Rotational torque : 2~25mN·m (Rotational speed 60°/sec.)
3. Stopper strength : No damage with an application of 0.5N·m.
4. Resistance to soldering heat : Please refer to the attached
5. Bushing nut tightening strength : Tightening torque to be no greater than 1N·m.
   *Pay attention otherwise the strength may not be assured.



6. Push/pull strength :
   After installing the potentiometer, no damages with an application of push or pull force 80N for 10 seconds.
7. Shaft wobble :
   The resistor shall be mounted by soldering the mounting legs on the panel and a side thrust of 50mN·m at the end of the shaft shall be applied, then the total play of the shaft shall not exceed 0.6xL/20 mmp-p.
   (L is the length between mounting surface and measuring point.)

ENDURANCE

1. Rotational life : 15,000 cycles min.

NOTE

1. Operating temparature range : -10~+70°C
2. Storage temparature range : -20~+80°C
3. The items except above mentioned items shall meet or exceed JIS C 6443.
4. The use for HomeAudio.
5. This type is protected against sulfides.

SYMB	DATE	APPD	CHKD	DSGD

ALPS ELECTRIC CO., LTD.

APPD.	CHKD.	DSGD.	TITLE
Aug. 19, '93	Aug. 19, '93	Aug. 19, '93	F1689858M
S. Aizawa	M. Satoh	Y. Saitoh	DOCUMENT NO. LX

SPECIFICATIONS

Resistance to soldering heat :
There shall be no evidence of poor contact between resistancee element and terminals, or any physical damages as a result of soldering.

*Dip soldering :
Condition of soldering :
Soldering shall be certified with following condition.

Substrate to be soldered :
Copper clad laminated phenol board in one surface of 1.6mm thickness.

Solder flux :
Flux of 0.82 specific weight in bubbling type solder fluxcoating apparatus shall be used and bubbling surface height shall be defined substantially as half thickness of substrate.
Flux shall not flow up on substrate surface.

Preheating
Surface temperature of substrate shall be settled within 100°C in two minutes.

Dip soldering :
To be performed in 260±5°C , 5±1 sec.

Please use the above process only one or two times.

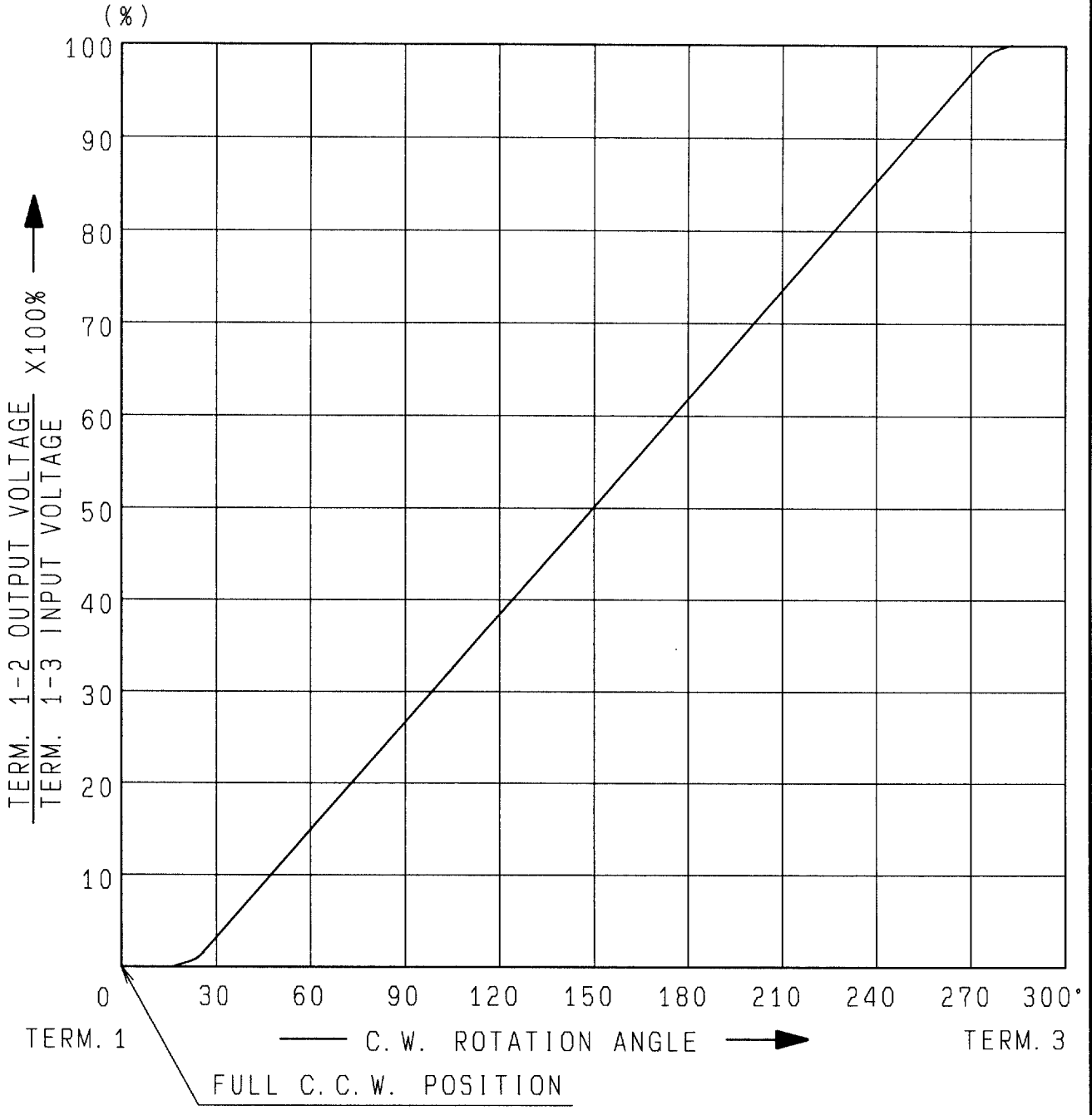
*Manual soldering :
To be performed in three seconds within 350°C.

SYMB	DATE	APPD	CHKD	DSGD

ALPS ELECTRIC CO., LTD.

APPD.	CHKD.	DSGD.	TITLE
Aug. 19, '93	Aug. 19, '93	Aug. 19, '93	F1689858M
S. Aizawa	M. Satoh	Y. Saitoh	DOCUMENT NO. LX

ALPS ELECTRIC CO., LTD
1-7 YUKIGAYA OTSUKA-CHO OTA-KU TOKYO JAPAN



AT 150° C. W. SHAFT ROTATION FROM FULL C. C. W. POSITION VOLTAGE PERCENT SHALL FALL WITHIN THE LIMITS OF 40~60 PERCENT.

SYMB	DATE	APPD	CHKD	DSGD

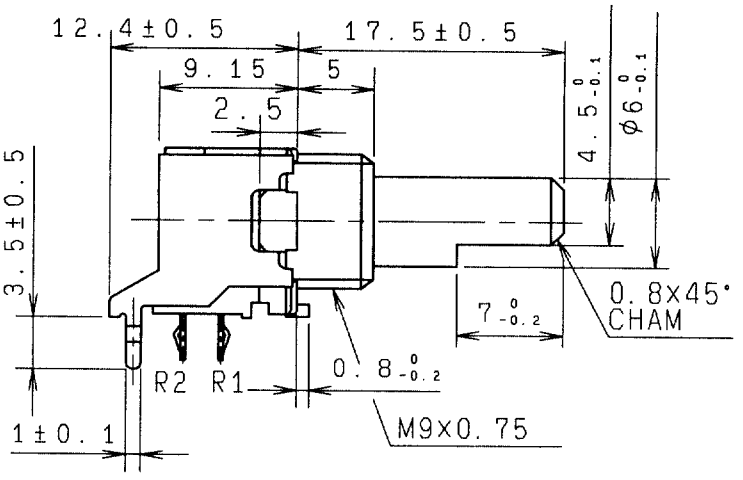
APPD.	CHKD.	DSGD.
Sep. 07, '93	Sep. 07, '93	Sep. 07, '93
K. Magami	K. Sasaki	K. Suzuki

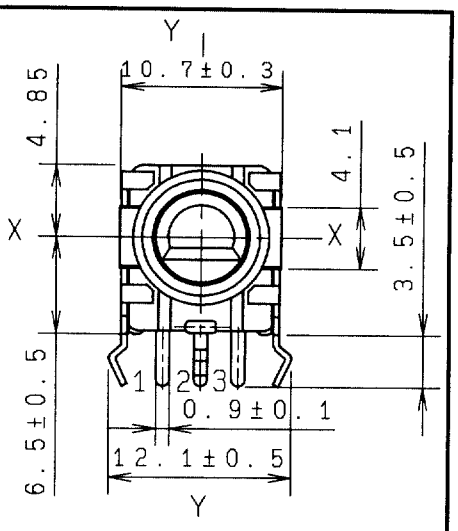
NAME
RESISTANCE TAPER (B)

DOCUMENT NO.
F1689858M

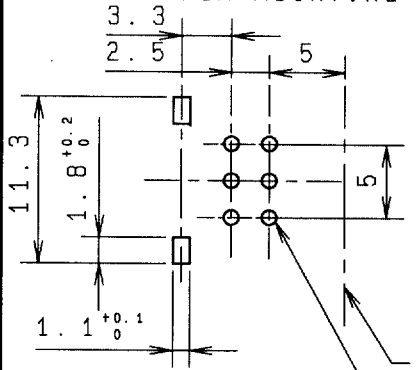
LX

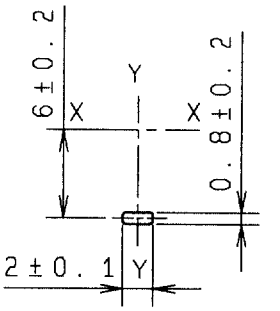
Format by S Sato





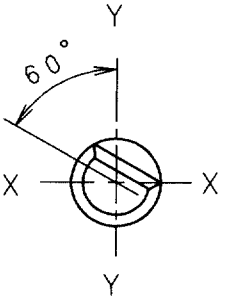
端子取付穴寸法図（挿入側より見た図）
（許容差±0.1）
MOUNTING HOLE DETAIL
(TOLERANCE±0.1)
VIEWED FROM MOUNTING SIDE



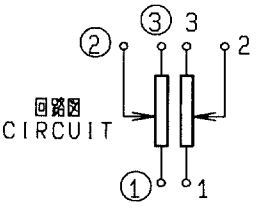


シャーシ止め 詳細図
LOCATING LUG
DETAIL

軸はセンター位置を示す
SHAFT SHOWN IN
CENTER POSITION



軸は、反時計方向に
回し切った状態を示す
SHAFT SHOWN
IN FULL C.C.W
POSITION.



製品質量：6.6g
NET WEIGHT

指定なき部分の許容差 TOLERANCES UNLESS OTHERWISE SPEC	
L≦10	±0.3
10＜L＜100	±0.5
100≦L	±0.8
角度 ANGULAR DIMENSION	±5°

PART NO.	NAME	MATERIAL NAME / CODE	FINISH	
—	—	—		

SYMB	DATE	APPD	CHKD	DSGD

ALPS ELECTRIC CO., LTD.

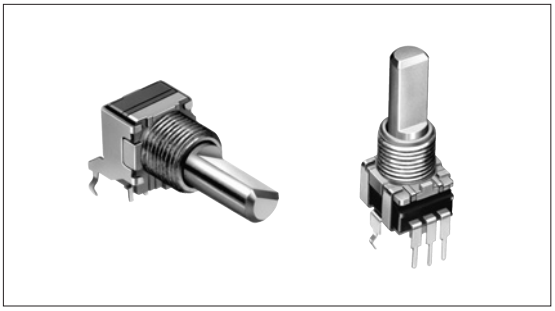
DSGN. 1-設計1課 Y. Saitoh 93-10-01	SCALE 2/1	NO. F1689858M
CHKD. SEC M. Satoh 93-10-01		TITLE 9形1軸2連VR組立図 FIGURE
APPD. SEC S. Aizawa 93-10-01	UNIT mm	DOCUMENT NO. K092G000C G01

9mm Size Metal Shaft Snap-in Type

RK09L Series

RoHS applicable

Single-unit and dual-unit type suits a variety of controls.



Features

- Snap-in structure assures easy mounting.
- Closed structure improves dust and flux resistance.
- Available in horizontal and vertical type.

Applications

- For various control in audio equipment products - DVD players/recorders, mini component systems, portable audio equipment
- For various control in mixing consoles and electronic musical instruments

Typical Specifications

Items	Specifications
Total resistance tolerance	±20%
Maximum operating voltage	50V AC , 10V DC
Total rotational angle	300±5°
Rotational torque	2 to 25mN·m
Operating life	15,000cycles
Operating temperature range	−10℃ to +70℃

Recommended Products List

Number of resistor elements	Mounting direction	Shaft type	Length of the shaft (mm)	Center detent	Total resistance (kΩ)	Resistance taper	Minimum packing unit (pcs.)	Products No.	Drawing No.
Single-unit	Horizontal type	Flat	15	Without	10	15A	100	RK09L1120A2S	1
				With		1B		RK09L1120036	
			20	Without		15A		RK09L1120A69	
	Vertical type		12.5			1B		RK09L1140A5E	2
								RK09L1140A66	
			15		50			RK09L1140A5P	
			20		10			RK09L1140A2U	
				With				RK09L114001T	
			25	Without	5			RK09L1140A65	
Dual-unit	Horizontal type for tone		15	With	50			RK09L122002M	3
				Without	100			RK09L1220A1B	
	Horizontal type for vol.				50	15A		RK09L12B0A31	
			25		10	3B		RK09L12B0A3Z	
	Vertical type for tone		15	With	50	1B		RK09L124000Z	4
			20	Without				RK09L1240A0W	
	Vertical type for vol.		15		10	15A		RK09L12D0A1W	
			20					RK09L12D0A1T	

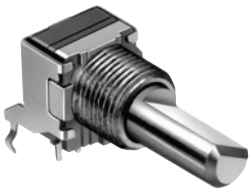
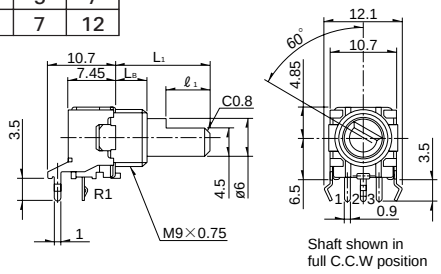
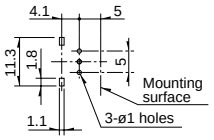
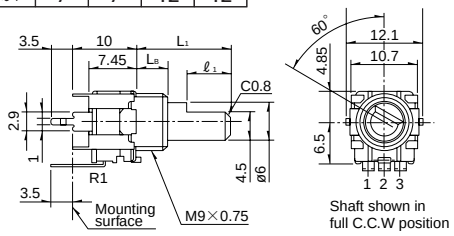
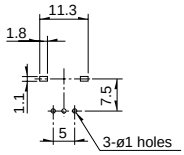
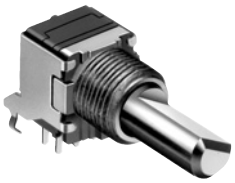
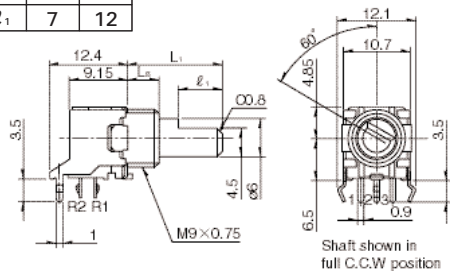
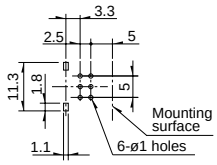
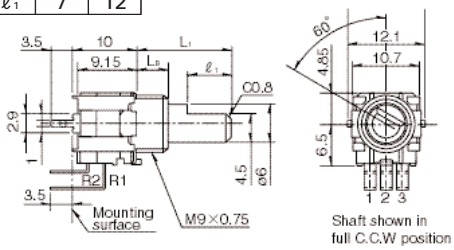
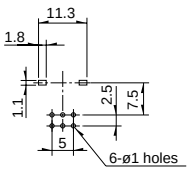
Note

Products other than those listed in above recommended products are also available. Please contact us for details.

Refer to **P.13** for product varieties.
Refer to **P.52** for product specifications.

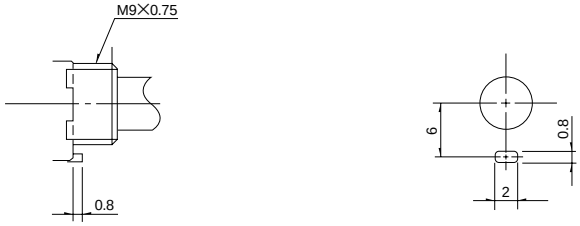
Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1	**Single-shaft, single-unit Horizontal type RK09L1120** 	L_1: 15, 20 L_B: 5, 7 ℓ_1: 7, 12 	
2	**Single-shaft, single-unit Vertical type RK09L1140** 	L_1: 12.5, 15, 20, 25 L_B: 5, 5, 7, 7 ℓ_1: 7, 7, 12, 12 	
3	**Single-shaft, dual-unit Horizontal type RK09L1220 (For tone) RK09L12B0 (For vol.)** 	L_1: 15, 25 L_B: 5, 7 ℓ_1: 7, 12 	
4	**Single-shaft, dual-unit Vertical type RK09L1240 (For tone) RK09L12D0 (For vol.)** 	L_1: 15, 20 L_B: 5, 7 ℓ_1: 7, 12 	

Dimensions of Bushing and Fixing Lug

Unit:mm



Product Varieties

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

Total Resistance Variety

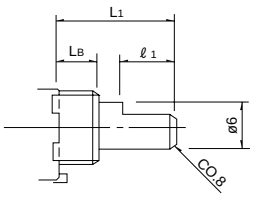
Total resistance (kΩ)	5	10	20	50	100

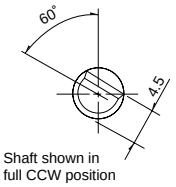
Resistance Taper

Resistance taper	15A	1B	3B	15C

Shaft Variety

Unit:mm





Shaft shown in full CCW position

Detail dimensions

L_1	L_B	ℓ_1
12.5	5	7
15	5	7
17.5	5	7
20	7	12
25	7	12

Note

marked are specifications recommended by ALPS.

Refer to **P.14, 211** for resistance taper.

Orders For Specifications Not Listed In The Recommended Products

When ordering product varieties that are not listed in the Recommended Product list, please specify by referring to the below example.

Sample Part Number

R	K	0	9	L	1	1	4	0	—	F	1	5	—	C	0	—	B	1	0	3

Model type

Code	Model type
112	Single-unit horizontal type
114	Single-unit vertical type
122	Dual-unit horizontal type for tone
124	Dual-unit vertical type for tone
12B	Dual-unit horizontal type for vol.
12D	Dual-unit vertical type for vol.

Shaft type

Code	Shaft type
F	Flat

＊Only available in flat format.

Length of the shaft (L_1) (mm)

Code	Length of the shaft	Code	Length of the shaft	Code	Length of the shaft
12	12.5	17	17.5	25	25
15	15	20	20		

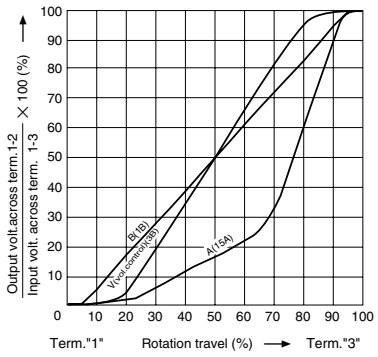
Detent

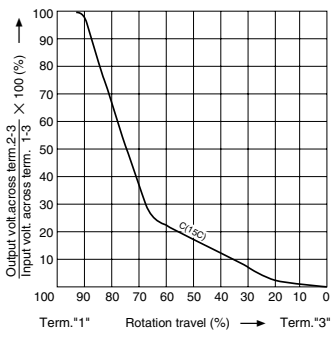
Code	Center detent
C0	Without
C1	With

Resistance taper

Code	Resistance taper	Code	Resistance taper
A	15A	V	3B
B	1B	C	15C

B:For tone & general(model type : 112,114,122,124)
V:For vol.(model type : 112,114,12B,12D)





Total resistance

Code	Total resistance (kΩ)	Code	Total resistance (kΩ)
502	5	503	50
103	10	104	100
203	20		

Note

marked are specifications recommended by ALPS.

Product Specifications

Items \ Model			RK09L	RK097 RK098	RK117	RK119	RK163 RK168
Operating temperature range			−10℃ to +70℃	−20℃ to +70℃	−30℃ to +70℃	−40℃ to +85℃	−10℃ to +70℃
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≦10kΩ 20Ω max. 10kΩ＜R＜50kΩ 30Ω max. 50kΩ≦R Nominal total resistance of 0.1% or less			R≦10kΩ 50Ω max. 10kΩ＜R≦50kΩ 80Ω max. 50kΩ＜R Nominal total resistance of 0.2% or less	R≦10kΩ 20Ω max. 10kΩ＜R≦50kΩ 30max. 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.				
	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±5°	300±5° (Shaft movement type is 300 $^{+10}_{-5}$°)	300 $^{+10}_{-5}$°		RK163 : 300±3° RK168 : 300±5°
	Rotational torque		2 to 25mN·m		5 to 20mN·m	7.5±3.5mN·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℃ max. 3s max.			350±10℃ 3 $^{+1}_{0}$ s	350℃ max. 3s max. Motor terminal : 350℃ max 2s max.
		Dip soldering	260±5℃, 5±1s			———	
		Reflow soldering	———			Please see P.35	———
Endurance	Operating life		15,000cycles				
Environ-mental performance	Cold		−20℃±2℃ for 96h	−30±2℃ for 96h		−40±2℃ for 240h	−20±2 for 96h
	Dry heat		70±2℃ for 96h			85±2℃ for 240h	70±2℃ for 96h
	Damp heat		40±2℃, 90 to 95%RH for 96h			60±2℃, 90 to 95%RH for 240h	40±2℃, 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 $^{+4}_{-2}$	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.

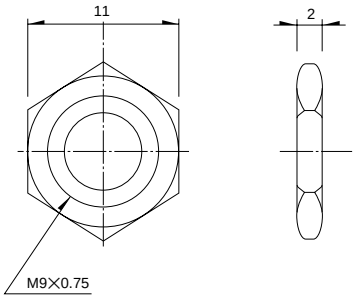
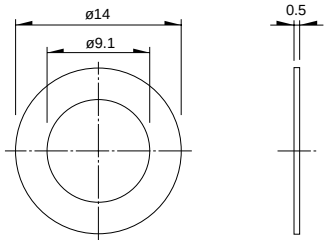
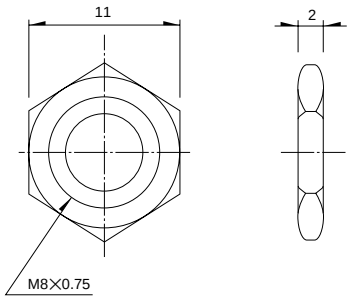
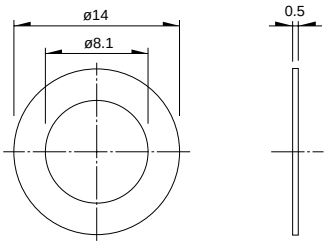
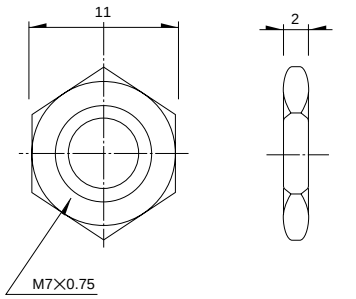
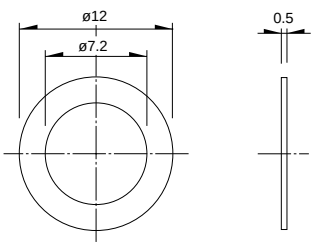
Note

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

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