

The high accuracy space saving design contributes to reduced weight and size of sets.



#### Typical Specifications

Items	Specifications
Rated Voltage	5V DC
Operating life	200,000cycles
Total resistance	10kΩ
Operating temperature range	-30°C to +85°C

Resistive  
Position  
Sensors

#### Product line

Travel (mm)	Linearity	Length of lever (mm)	Length of terminal (mm)	Minimum order unit (pcs.)		Model No.
				Japan	Export	
14	± 0.5%	4.5	2	2,400	4,800	RDC1014A09
22				2,100	4,200	RDC1022A05
32				900	1,800	RDC10320RB
47		4.4		1,000	2,000	RDC1047A03

#### Note

Other varieties are also available. Please inquire.

#### Packing Specifications

##### Tray

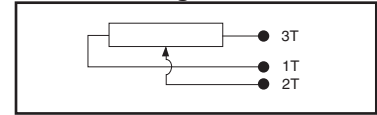
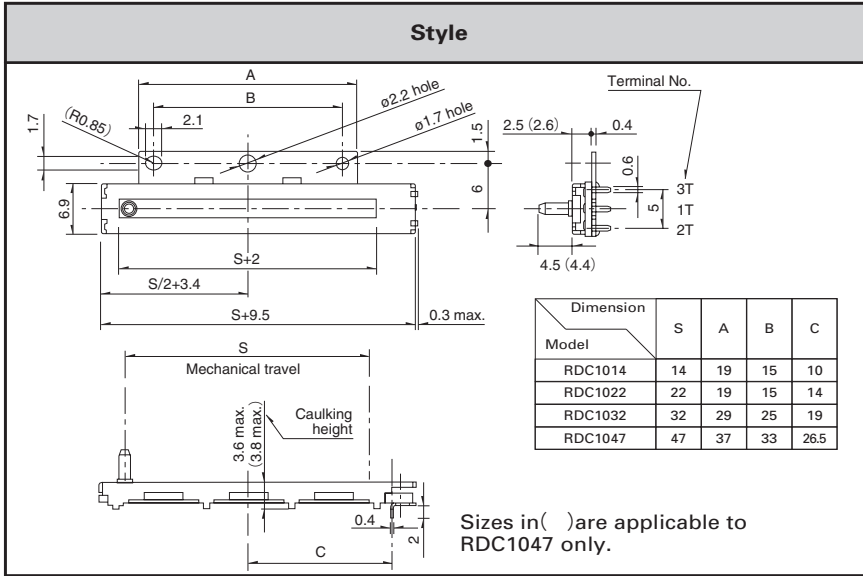
Model No.	Number of packages (pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
RDC1014	2,400	4,800	374 × 508 × 272
RDC1022	2,100	4,200	374 × 508 × 302
RDC1032	900	1,800	540 × 360 × 205
RDC1047	1,000	2,000	374 × 508 × 272

Refer to **P.438** for product varieties.  
Refer to **P.441** for product specifications.  
Refer to **P.442** for soldering conditions.

Dimensions

Unit:mm

Circuit Diagram



Linear Type Resistive Position Sensors / Product Varieties

In addition to the products listed, we can accommodate the follow specifications.

**Lever Variety** \* Sizes in ( ) are applicable to RDC1047 only

Length	4.5 (4.4)	3.7 (3.6)	3 (2.9)	2.5 (2.4)
Dimensions				















**Terminal Variety**

	For printed wiring				For lead wiring	
	Unit:mm				Unit:mm	
Dimensions						
Length L2	1.5	2	4	5.5		

**Note**  
Shows the specification recommended by Alps.

# Resistive Position Sensors

## List of Varieties

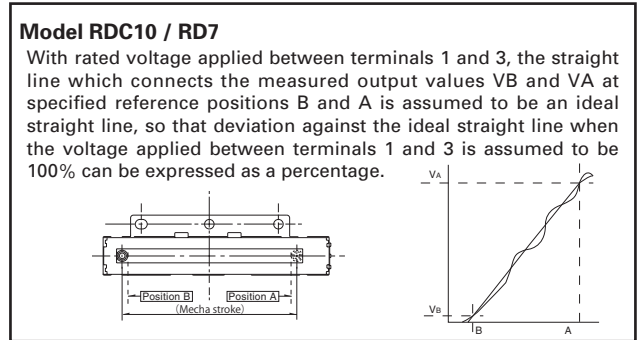
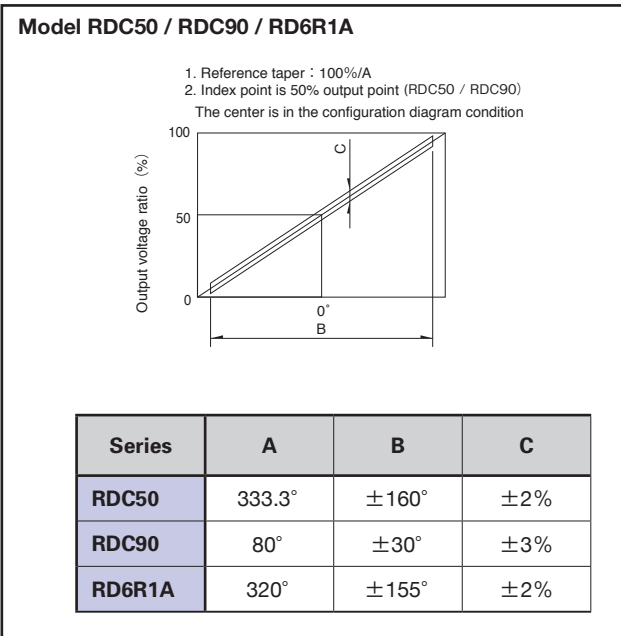
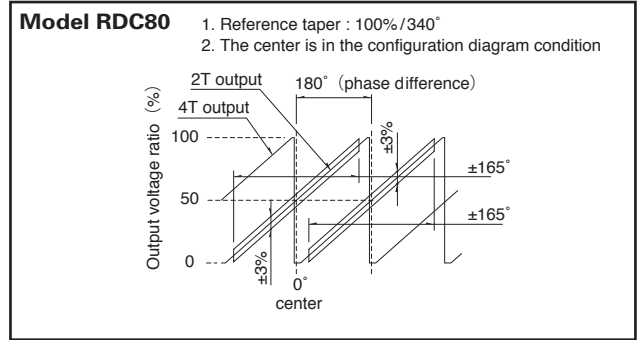
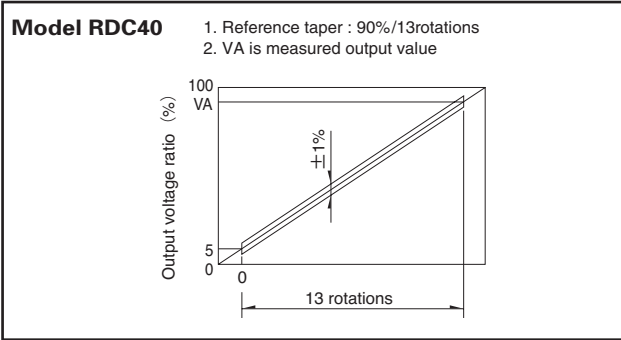
Type	Rotary Type					Linear Type			
Series	RDC40	RDC50	RDC90	RDC80	RD6R1A	RDC10	※ RD7		
Photo									
Direction of lever	Horizontal	Vertical Horizontal	Vertical					Vertical	Horizontal
Effective electrical angle (°)	5,400 (15 rotations)	333.3	80 (260 max.)	340 (1-phase) 360 (2-phase)	320	—	—		
Linearity guarantee range (°)	4,680 (13 rotations)	320	60 (244 max.)	330 (1-phase) 360 (2-phase)	310 max.	—	—		
Travel	—	—	—	—	—	14mm 22mm 32mm 47mm	8mm 12mm	8mm 9mm 12mm	
Operating temperature range	-30°C to +80°C	-40°C to +120°C			-40°C to +85°C	-30°C to +85°C	-40°C to +105°C		
Operating life	100,000 cycles	1,000,000 cycles	10,000,000 cycles	100,000 cycles	500,000 cycles	200,000 cycles	100,000 cycles		
Available for automotive use	●	●	●	●	●	●	●		
Life cycle (availability)									
Mechanical performance	Operating force	—	—	—	—	0.25N max.	2N max.		
	Rotational torque	1.96 mN·m max.	2mN·m max.		10mN·m max.	100mN·m	—		
Electrical performance	Total resistance tolerance	±30%				±20%	±30%	±20%	
	Linearity (%)	±1	±2	±3		±2 (320°)	±0.5	±1	
	Rated Voltage (VDC)	5						12	
Environmental test	Cold	-30±3°C for 240h	-40±3°C for 168h			-40±3°C for 240h	-40±2°C for 96h		
	Dry heat	80±2°C for 240h	120±3°C for 168h			85±3°C for 168h	90±2°C for 240h	105±2°C for 96h	
	Damp heat	60±2°C, 90 to 95%RH for 240h	60±2°C, 90 to 95%RH for 96h			80°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	
Terminal style	Connector	Insertion / Reflow	Reflow		Connector	Lead terminal / Insertion	Insertion		
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### Note

1. ※ The RD7 series are used to detect vehicle headlight angles.
2. ● indicates applicability to all products in the series.

## Method for Regulating the Linearity



## Resistive Position Sensors / Measurement and Test Methods

### Analog Output Contact Type Sensor

#### [Total Resistance]

The total resistance, with the shaft (lever) placed at the end of terminal 1 or 3, shall be determined by measuring the resistance between the resistor terminals 1 and 3 unless otherwise specified.

#### [Rating Voltage]

The rating voltage corresponding to the rated power shall be determined by the following equation. When the resulting rated voltage exceeds the maximum operating voltage of a specific resistor, the maximum operating voltage shall be taken as the rated voltage.

$E = \sqrt{P \cdot R}$
E : Rated voltage (V)
P : Rated power (W)
R : Total nominal resistance (Ω)

# Resistive Position Sensors Soldering Conditions

## Reference for Hand Soldering

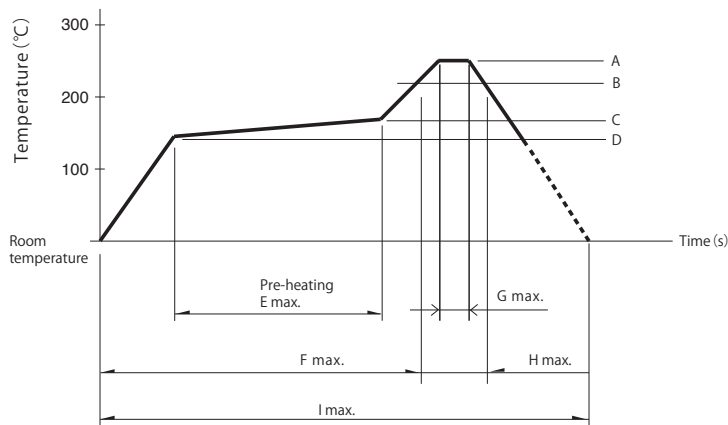
Series	Tip temperature	Soldering time
RDC50, RDC90, RDC80	350±5°C	3 <sup>+1</sup> <sub>0</sub> s
RDC10, RD7	350°C max.	3s max.

## Reference for Dip Soldering

Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
RDC501, RDC502	100 to 150°C	1min. max.	260±5°C	10±1s	1 time
RD7	100°C max.	1min. max.	260°C max.	5s max.	1 time

## Example of Reflow Soldering Condition

1. Cleaning Cleaning should not be attempted.
2. Type of solder to be used Use cream solder that contains 10 - 15 %wt flux.
3. Number of solder applications - apply solder only once
4. Recommended reflow conditions



Series	A	B	C	D	E	F	G	H	I	No. of reflows
RDC503 RDC506	250°C	230°C	180°C	150°C	2min.	—	5s	40s	4min.	1 time
RDC90	255°C	230°C	—	—	—	2min.	10s	1min.	4min.	1 time
RDC80	250°C	—	180°C	150°C	90±30s	—	10±1s	—	—	1 time

## Notes

1. When using an infrared reflow oven, solder may not always be applied as intended. Be sure to use a hot air reflow oven or a type that uses infrared rays in combination with hot air.
2. The temperatures given above are the maximum temperatures at the terminals of the potentiometer when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the potentiometer may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the potentiometer does not rise to 250° C or greater.
3. Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.