

**Typical Specifications**

Items	Specifications		
	RDC40	RDC50	RDC90
Rated voltage	5V DC		
Operating life	100,000 cycles	1,000,000 cycles	10,000,000 cycles
Total resistance	10kΩ		3.3kΩ (RDC9010006) 10kΩ (RDC9010007)
Operating temperature range	-30°C to +80°C		-40°C to +120°C

**Product Line**

Mounting method	Linearity guarantee range	Linearity	Hollow shaft variation	Operating life (cycles)	Minimum order unit (pcs.)		Model No.	Drawing No.
					Japan	Export		
Connector type	13 rotations	±1%	—	100,000	770	770	<b>RDC401D07A</b>	1
Horizontal type	320°	±2%	φ3.5 dia	1,000,000	1,500	3,000	<b>RDC501051A</b>	2
			φ3.5 dia with radius				<b>RDC501052A</b>	3
Vertical type			φ3.5 dia		1,600	1,600	<b>RDC502012A</b>	4
Reflow type			φ3.5 dia with radius		3,900	3,900	<b>RDC503051A</b>	5
			<b>RDC503052A</b>		6			
Reflow type (Low-profile)			φ4 dia		3,600	3,600	<b>RDC506018A</b>	7
Reflow type (Long-life)	60°	±3%	φ3.5 dia	10,000,000	1,960	1,960	<b>RDC9010006</b>	8
	244°						<b>RDC9010007</b>	

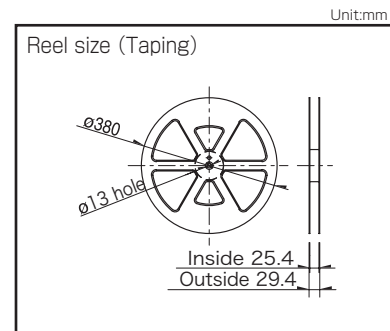
**Note**

Other varieties are also available. Please inquire.

**Packing Specifications**

Tray / Taping

Series	Packing Specifications	Number of packages (pcs.)		Tape width (mm)	Export package measurements (mm)
		1 case / Japan	1 case / export packing		
<b>RDC40</b>	Tray	770	770	—	526×370×191
<b>RDC501</b>		1,500	3,000		
<b>RDC502</b>		1,600	1,600		
<b>RDC503</b>	Taping	3,900	3,900	24	407×415×135
<b>RDC506</b>		3,600	3,600		
<b>RDC90</b>	Tray	1,960	1,960	—	240×300×270


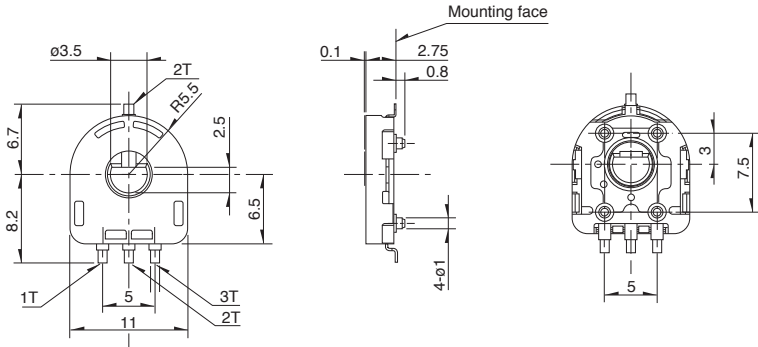
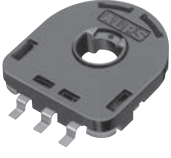
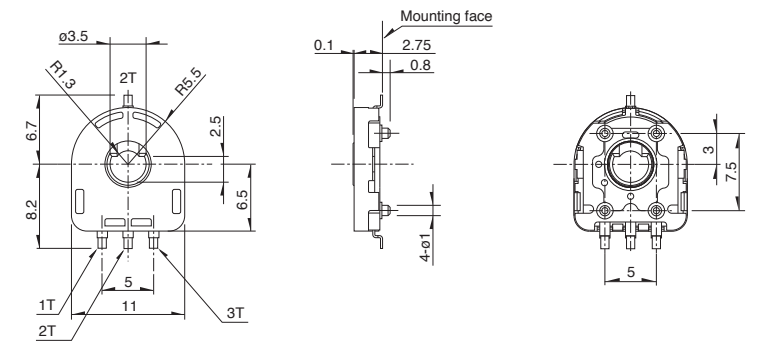

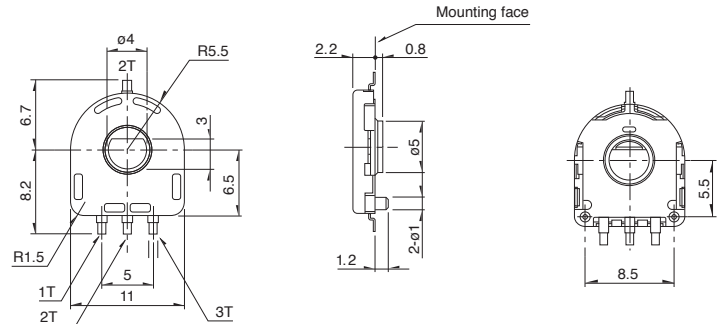

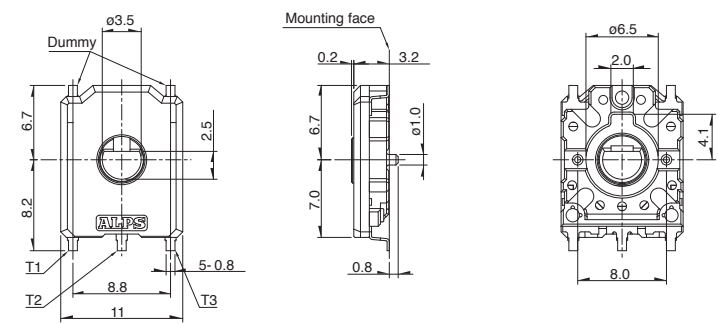


Refer to P.488 for product specifications.  
Refer to P.489 for soldering conditions.

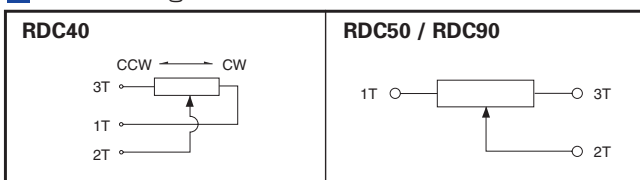


■ Dimensions

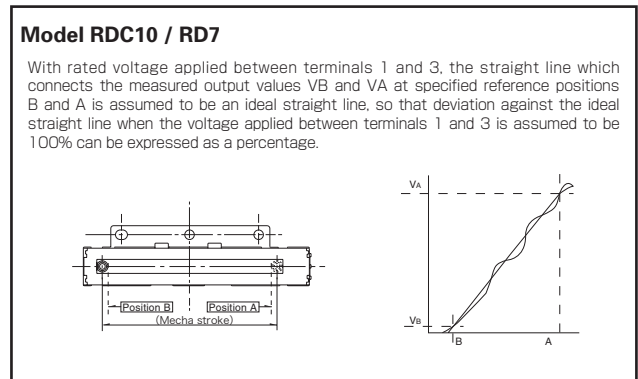
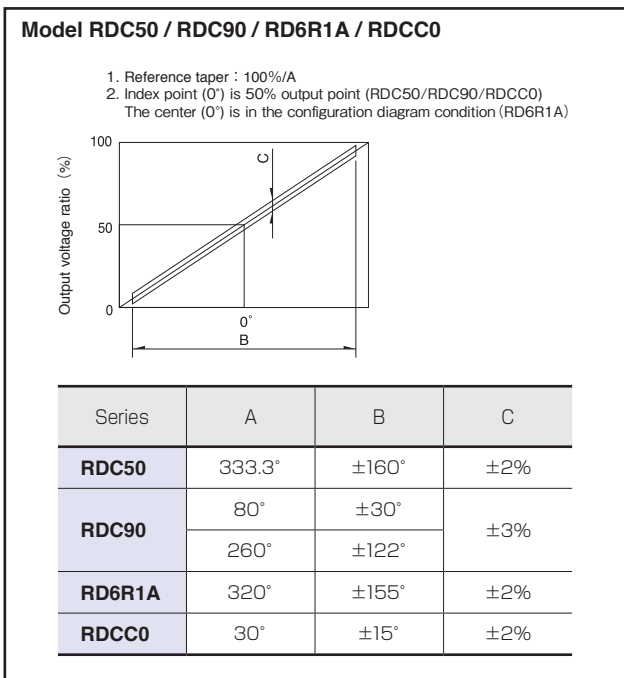
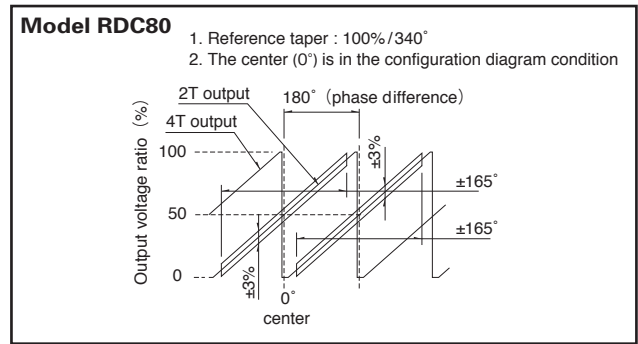
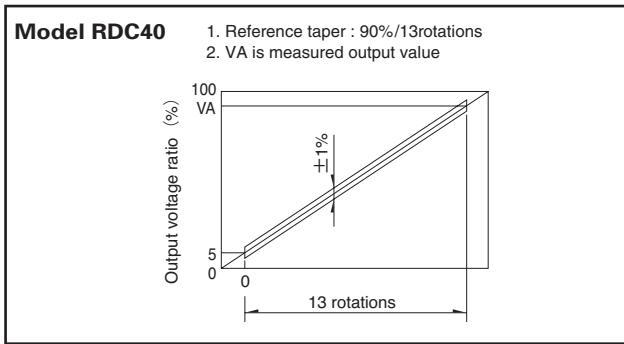
Unit:mm

No.	Photo	Style
5		
6		
7		
8		

■ Circuit Diagram



## Method for Regulating the Linearity



## Resistive Position Sensors / Measurement and Test Methods

### Resistive Position 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.

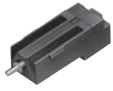











$$E = \sqrt{P \cdot R}$$

**E** : Rated voltage (V)  
**P** : Rated power (W)  
**R** : Total nominal resistance (Ω)

Resistive Position Sensors  
Rotary Type  
Linear Type

# Resistive Position Sensors

## List of Varieties

Type	Rotary Type					Magnetic Rotary Type	
Series	RDC40	RDC50	RDC90	RDC80	RD6R1A	RDCC0	
Photo							
Direction of lever	Horizontal	Vertical Horizontal	Vertical				
Effective electrical angle (°)	5,400 (15 rotations)	333.3	80, 260	340 (1-phase) 360 (2-phase)	320	30	
Linearity guarantee range (°)	4,680 (13 rotations)	320	60, 244	330 (1-phase) 360 (2-phase)	310	±15	
Travel	—	—	—	—	—	—	
Operating temperature range	−30°C to +80°C	−40°C to +120°C			−40°C to +85°C	0°C to +50°C	
Operating life	100,000 cycles	1,000,000 cycles	10,000,000 cycles	20,000 cycles	500,000 cycles	10,000,000 cycles	
Available for automotive use	●	●	●	●	●	—	
Life cycle (availability)							
Mechanical performance	Operating force	—	—	—	—	—	
	Rotational torque	1.96mN·m max.	2mN·m max.		10mN·m max.	100mN·m	5mN·m max.
Electrical performance	Total resistance tolerance	±30%				±20%	—
	Linearity (%)	±1	±2	±3		±2 (320°)	±2
	Rated voltage (V DC)	5					
Environmental performance	Cold	−30°C 240h	−40°C 168h			−40°C 240h	
	Dry heat	80°C 240h	120°C 168h			85°C 168h	85°C 240h
	Damp heat	60°C, 90 to 95%RH 240h	60°C, 90 to 95%RH 96h			80°C, 90 to 95%RH 96h	60°C, 90 to 95%RH 240h
Terminal style	Connector	Insertion / Reflow	Reflow		Connector		
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### Note

- Indicates applicability to all products in the series.

## Reference for Manual Soldering

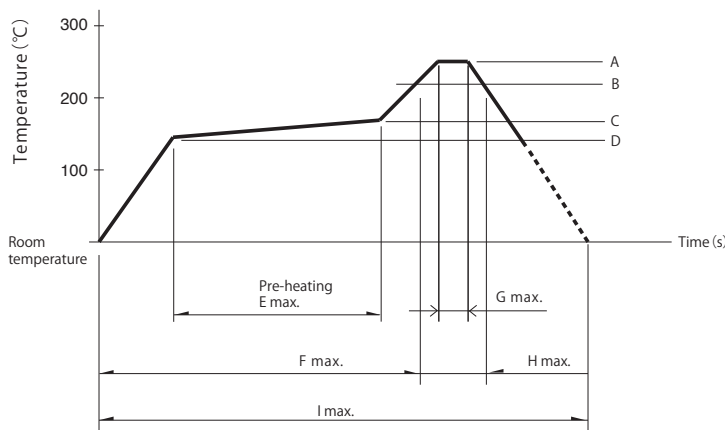
Series	Tip temperature	Soldering time
<b>RDC50, RDC90, RDC80</b>	350±5°C	3 <sup>+</sup> <sub>0</sub> s
<b>RDC10, RD7</b>	350°C max.	3s max.

## Reference for Dip Soldering

Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
<b>RDC501, RDC502</b>	100 to 150°C	1minute max.	260±5°C	10±1s	1 time
<b>RD7</b>	100°C max.	1minute 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 to 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
<b>RDC503 RDC506</b>	250°C	230°C	180°C	150°C	2min.	—	5s	40s	4min.	1 time
<b>RDC90</b>	255°C	230°C	—	—	—	2min.	10s	1min.	4min.	1 time
<b>RDC80</b>	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 sensor when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the sensor may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the sensor 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.