Rotary sensors catering to diverse position detection needs









■ Typical Specifications

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

Product Line

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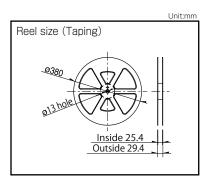
Mounting method	Linearity	Linearity	Hollow shaft variation	Operating life	Minimum ord	er unit (pcs.)	Model No.	Drawing No.	
Woulding method	guarantee range	Lineanty	I lollow Shart variation	(cycles)	Japan	Export	Model No.	Drawing No.	
Connector type	13 rotations	±1%	_	100,000	770	770	RDC401D07A	1	
Horizontal type		320° ±2%	φ3.5 dia		1500	1.500 3.000 RDC501051A	2,000	RDC501051A	2
Horizoritai type	Туре		ϕ 3.5 dia with radius	1,000,000	1,500	3,000	RDC501052A	3	
Vertical type	320°		φ3.5 dia		1,600	1,600	RDC502012A	4	
Reflow type					3,900	3,900	RDC503051A	5	
Hellow type			ϕ 3.5 dia with radius				RDC503052A	6	
Reflow type (Low-profile)			φ4 dia		3,600	3,600	RDC506018A	7	
Reflow type	60°	±3%	φ3.5 dia	10.000.000	1.960	1.960	RDC9010006	- 8	
(Long-life)	244°	13%	ψ3.3 dia	10,000,000	1,300	1,300	RDC9010007		

Other varieties are also available. Please inquire.

Packing Specifications

Tray / Taping

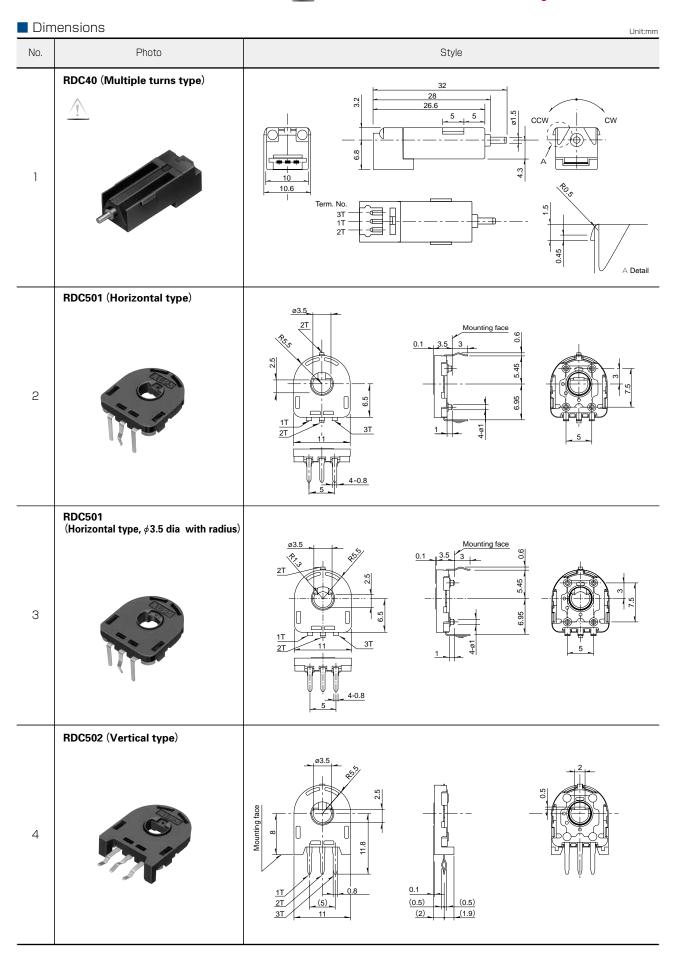
Series	Packing	Number of pa	ckages (pcs.)	Tape width	Export package measurements (mm)	
Jenes	Specifications	1 case /Japan	1 case /export packing	(mm)		
RDC40		770	770		526×370×191	
RDC501	Tray	1,500	3,000	-		
RDC502		1,600	1,600		370×280×92	
RDC503	Taping	3,900	3,900	24	415×407×135	
RDC506	raping	3,600	3,600	<i>-</i> 4		
RDC90	Tray	1,960	1,960	_	300×240×270	





*Products marked with a <u> </u> are not recommended for new designs

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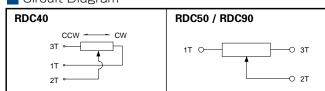


Dimensions

Unit:mm

No.	Photo	Style
5	RDC503 (Reflow type)	Mounting face 0.1 2.75 0.8 11 11 21
6	RDC503 (Reflow type, ϕ 3.5 dia with radius)	0.1 2.75 0.1 2.75 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8
7	RDC506 (Reflow type, low-profile)	Mounting face 2.2 8.5 1.2 1.2 8.5 1.2 8.5
8	RDC90 (Reflow type, Long-life)	Dummy 93.5 Mounting face 96.5 2.0 11 12 8.8 13

Circuit Diagram



Resistive Position Sensors

List of Varieties

	Type		Rotary	/ Туре	
	Series	RDC40	RDC50	RDC90	RD6R1A
	Photo	\triangle			
Direc	ction of lever	Horizontal	Vertical Horizontal	Ver	tical
Effective e	electrical angle (°)	5,400 (15 rotations)	333.3	80, 260	320
Linearity g	uarantee range (°)	4,680 (13 rotations)	320	60, 244	310
	Travel	_	_	-	_
Operating temperature range		−30°C to +80°C	-40°C to +120°C		-40℃ to +85℃
Operating life		100,000 cycles	1,000,000 cycles	10,000,000 cycles	500,000 cycles
Available for automotive use		_	•	•	•
Life cyc	cle (availability)	*2	* 2	*	
Mechanical	Operating force	_	_	_	_
performance	Rotational torque	1.96mN·m max. 2mN·m max.		100mN·m	
	Total resistance tolerance		±30%		±20%
Electrical performance	Linearity (%)	±1	±2	±3	±2 (320°)
	Rated voltage (V DC)		Ę	5	
	Cold	−30°C 240h	-30℃ 240h -40℃ 168h		
Environmental performance Dry heat		80℃ 240h	80°C 240h 120°C 168h		85°C 168h
	Damp heat	60°C, 90 to 95%RH 240h	60°C, 90 to 95%RH 96h		80°C, 90 to 95%RH 96h
Ter	minal style	Connector	Insertion / Reflow	Reflow	Connector
	Page		456		459

Note

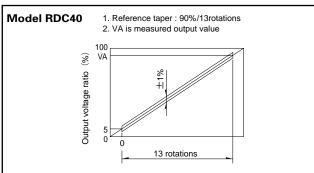
 \bullet Indicates applicability to all products in the series.

*Products marked with a $\underline{\wedge}$ are not recommended for new designs

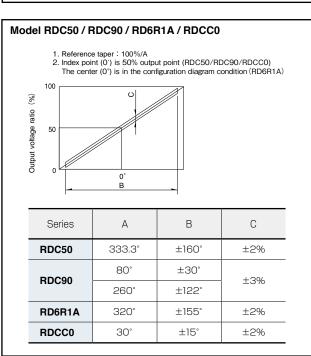


Resistive Position Sensors / Product Specifications

■ Method for Regulating the Linearity



With rated voltage applied between terminals 1 and 3, the straight line which connects the measured output values VB and VA at specified reference positions B and A is assumed to be an ideal straight line, so that deviation against the ideal straight line when the voltage applied between terminals 1 and 3 is assumed to be 100% can be expressed as a percentage.



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.

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

Resistive Position Sensors / Soldering Conditions

Reference for Manual Soldering

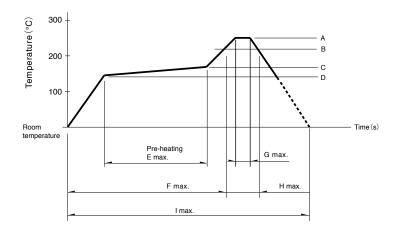
Series	Tip temperature	Soldering time	
RDC50, RDC90	350±5℃	3 ⁺¹ ₀ s	
RDC10, RD7	350℃ max.	3s max.	

Reference for Dip Soldering

Series	Prehe	eating	Dip so	N. C. III	
	Series Soldering surface temperature		Soldering time Soldering time		No. of solders
RDC501, RDC502	100 to 150℃	lminute max.	260±5℃	10±1s	1 time
RD7	100°C max.	lminute max.	260℃ max.	5s max.	1 time

■ Example of Reflow Soldering Condition

- 1. Cleaning sensors 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	А	В	С	D	E	F	G	Н	I	No. of reflows
RDC503 RDC506	250℃	230℃	180℃	150℃	2min.	_	5s	40s	4min.	1 time
RDC90	255℃	230℃	_	_	_	2min.	10s	1min.	4min.	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.

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Alps Alpine:

<u>RDC401D07A</u> <u>RDC502012A</u> <u>RDC501051A</u> <u>RDC501052A</u> <u>RDC9010006</u> <u>RDC506018A</u> <u>RDC503052A</u> RDC503051A RDC9010007