# 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	DkΩ 3.3kΩ (RDC90100 10kΩ (RDC901000				
Operating temperature range	-30℃ to +80℃	-40°C to +120°C				

### Product Line

Mounting method	Linearity	Linearity	Hollow shaft variation	Operating life	Minimum ord	er unit (pcs.)	Model No.	Drawing No.
Modriting metriod	guarantee range	Linounty	Tionow Share variation	(cycles)	Japan	Export	Wodel 146.	Brawing 140.
Connector type	13 rotations	±1%	_	100,000	770	770	RDC401D07A	1
Horizontal type		±2%	φ3.5 dia		1.500	3.000	RDC501051A	2
Horizoritai type	320°		$\phi$ 3.5 dia with radius		1,500	3,000	RDC501052A	3
Vertical type			φ3.5 dia	1.000.000	1,600	1,600	RDC502012A	4
Poflow type				1,000,000	3.900	3,900	RDC503051A	5
Reflow type			$\phi$ 3.5 dia with radius		3,900		RDC503052A	6
Reflow type (Low-profile)			φ4 dia		3,600	3,600	RDC506018A	7
Reflow type (Long-life)	60°		φ3.5 dia	10,000,000	1.960	1.960	RDC9010006	8
	244°	±3%	ψ3.3 นเล	10,000,000	1,360	1,360	RDC9010007	

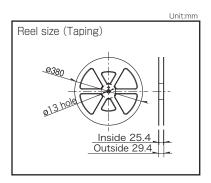
#### Note

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	407×415×135	
RDC506	rapirig	3,600	3,600	<i>∠</i> +	40/ / 410/ 100	
RDC90	Tray	1,960	1,960	_	240×300×270	



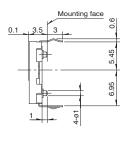
## Dimensions

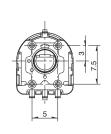
Unit:mm

No.	Photo	Style
1	RDC40 (Multiple turns type)	32 28 26.6 5 5 5 6 CCW CW
	RDC501 (Horizontal type)	<u>03.5</u>

2

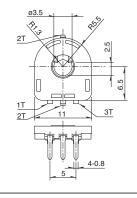


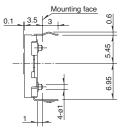


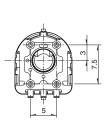


# RDC501 (Horizontal type, $\phi$ 3.5 dia with radius)



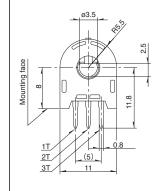


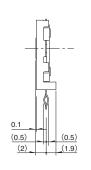


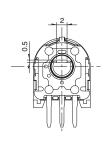


## RDC502 (Vertical type)









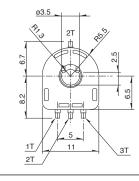
# Dimensions

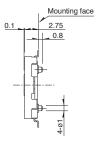
Unit:mm

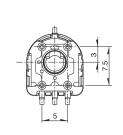
# No. Photo Style RDC503 (Reflow type) Mounting face 5 RDC503

## (Reflow type, $\phi$ 3.5 dia with radius)

6



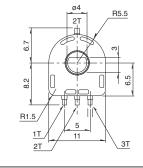


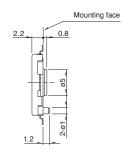


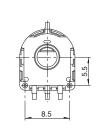
## RDC506 (Reflow type, low-profile)

7





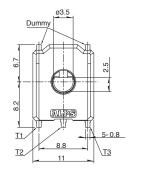


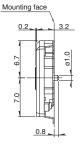


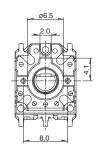
## RDC90 (Reflow type, Long-life)

8

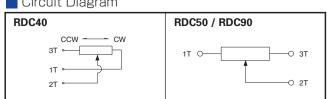








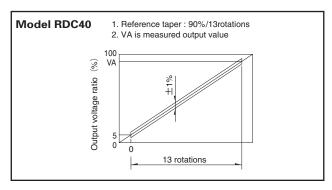
### Circuit Diagram

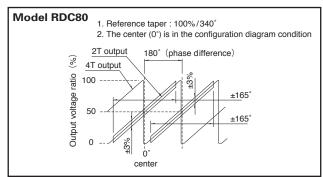




## Resistive Position Sensors / Product Specifications

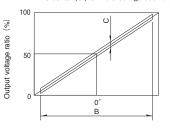
## ■ Method for Regulating the Linearity





#### Model RDC50 / RDC90 / RD6R1A / RDCC0

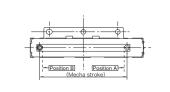
- 1. Reference taper: 100%/A
- 2. Index point (0') is 50% output point (RDC50/RDC90/RDCC0)
  The center (0') is in the configuration diagram condition (RD6R1A)

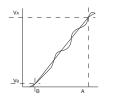


Series	А	В	С	
RDC50	333.3°	±160°	±2%	
DDC00	80°	±30°	±3%	
RDC90	260°	±122°	±3%	
RD6R1A	320°	±155°	±2%	
RDCC0	RDCC0 30°		±2%	

#### Model RDC10 / RD7

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=√P·R

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



# **Resistive Position Sensors**

# List of Varieties

	Type			Rotary Type			Magnetic Rotary Type	
	Series	RDC40	RDC50	RDC90	RDC80	RD6R1A	RDCC0	
	Photo			0	0			
Direc	ction of lever	Horizontal	Vertical Horizontal		Ver	tical		
Effective e	electrical angle (°)	5,400 (15 rotations)	333.3	80, 260	340 (1-phase) 360 (2-phase)	320	30	
Linearity go	uarantee 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℃ to +120℃		-40°C to +85°C	0℃ to +50℃		
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 cyc	cle (availability)	<b>*</b> 2	<b>★</b> 2	<b>★</b> 2		<b>2</b>	<b>★</b> 2	
Mechanical	Operating force	_	_	-	_	_	_	
performance	Rotational torque	1.96mN·m max.	2mN·n	n max.	100mN·m	5mN·m max.		
	Total resistance tolerance		±3	0%		±20%	_	
Electrical performance	Linearity (%)	±1	±2	±	:3	±2 (320°)	±2	
	Rated voltage (V DC)			Ę	5			
	Cold	-30°C 240h		-40℃		-40°C 240h		
Environmental performance Dry heat		80°C 240h		120℃ 168h	85℃ 168h	85℃ 240h		
Damp heat		60℃, 90 to 95%RH 240h	60	°C, 90 to 95%RH 9	6h	80°C, 90 to 95%RH 96h	60℃, 90 to 95%RH 240h	
Ter	minal style	Connector	Insertion / Reflow	Ref	ilow	Connector		
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#### Note

• Indicates applicability to all products in the series.

## Resistive Position Sensors / Soldering Conditions

#### Reference for Manual Soldering

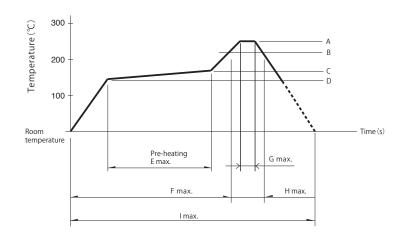
Series	Tip temperature	Soldering time		
RDC50, RDC90, RDC80	350±5℃	3 <sup>+1</sup> <sub>0</sub> s		
RDC10, RD7	350℃ max.	3s max.		

#### Reference for Dip Soldering

Series	Prehe	eating	Dip so	No. of solders	
	Series Soldering surface temperature		Soldering temperature		
RDC501, RDC502	100 to 150℃	lminute max.	260±5℃	10±1s	1 time
RD7	100℃ max.	lminute max.	260℃ 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	А	В	С	D	Е	F	G	Н	ı	No. of reflows
RDC503 RDC506	250℃	230℃	180℃	150℃	2min.	_	5s	40s	4min.	1 time
RDC90	255℃	230℃	_	_	_	2min.	10s	1min.	4min.	1 time
RDC80	250℃	_	180℃	150℃	90±30s	_	10±1s	_	_	1 time

#### Notes

- 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.

