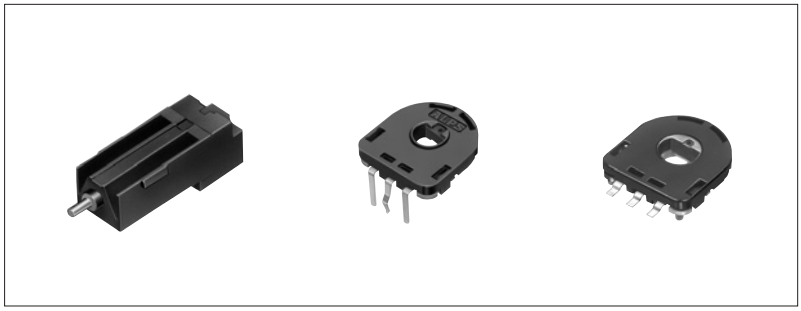
Rotary Type

RDC40/RDC50 Series

Compact, high precision, high heat resistant rotary sensors, meet various needs in position detection.



Car Use

RoHS applicable

Features

- Uses potentiometer system.
- Analog output facilitates signal processing.
- Provides stable output characteristics against external noise and temperature changes.

Applications

- Rotation detecting sensors in car air conditioners, projectors, digital cameras and photo copiers
- Joint angle detections in robots
- Digital video cameras
- Car navigation systems

Typical Specifications

Items	Specifications
Rating voltage	5V DC
Rotational torque	2mN·m max.
Operating life	1,000,000cycles (RDC40:100,000cycles)
Total resistance	10kΩ
Total resistance tolerance	±30%

Recommended Product List

Mounting method	Effective variable range	Linearity	Hollow shaft variation	Operating life (cycles)	Model No.	Minimum packing unit (pcs.)※	Drawing No.
Connector type	13rotations	±1%	—	100,000	RDC401D07A	770	1
Horizontal type	320°	±2%	ϕ3.5 dia	1,000,000	RDC501015A	1,500	2
			ϕ3.5 dia with radius		RDC501011A		3
Vertical type			ϕ3.5 dia		RDC502006A	1,600	4
Reflow type					RDC503013A	1,300	5
			ϕ3.5 dia with radius		RDC503015A		6
Reflow type(Low-profile)			ϕ4 dia		RDC506002A	1,200	7

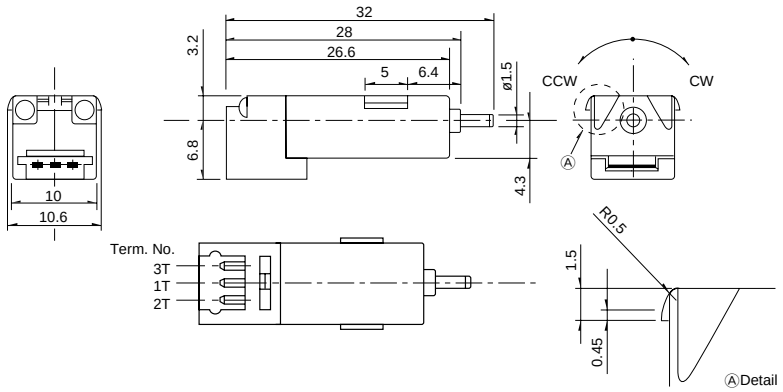
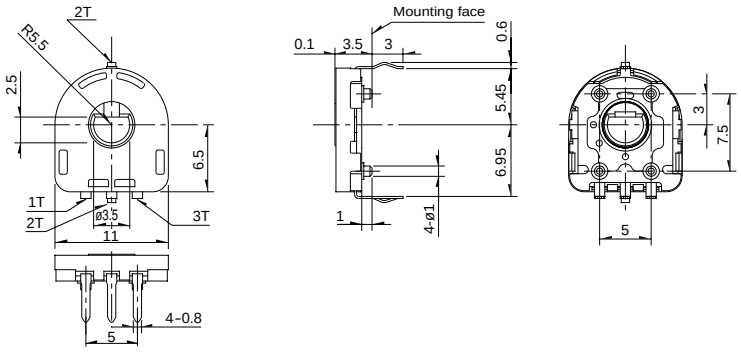
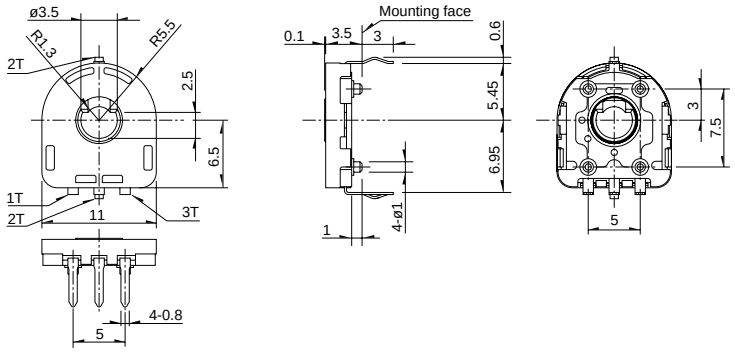
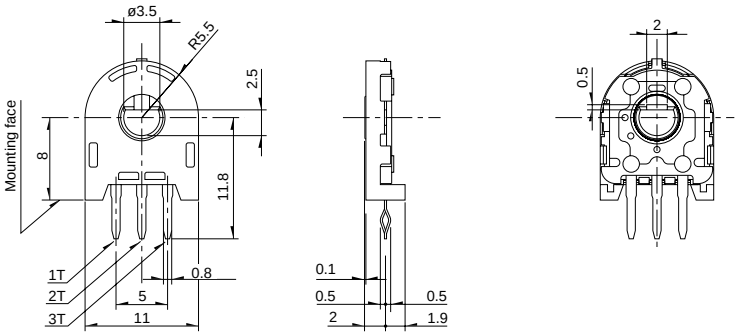
Notes

1. Additional product specifications in response to those not included in the above recommended products are also available.
2. ※The minimum package content means the basic unit quantity for your order. Kindly determine your purchase order quantity to the "minimum package content" × N (an integral number). Please note that we will inform you separately for export packaging (content) quantity.

For other product specifications, see **P.28**

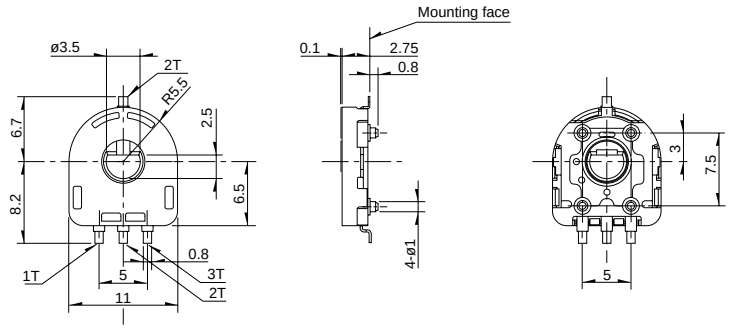
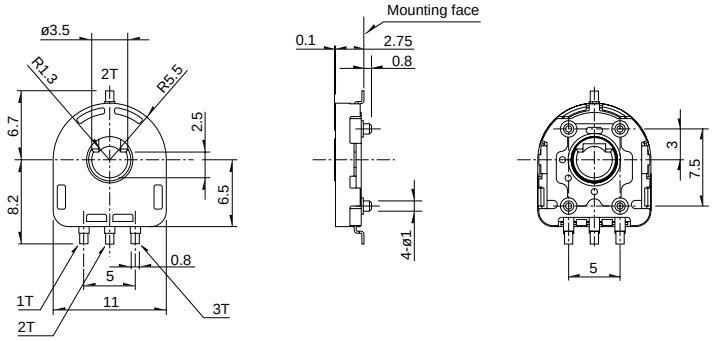
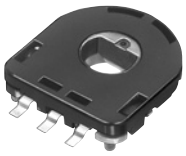
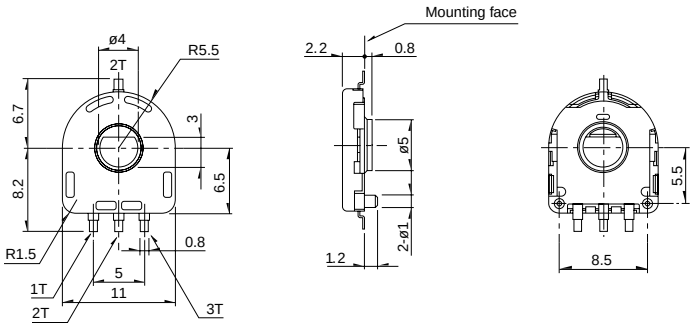
Dimensions

Unit:mm

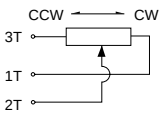
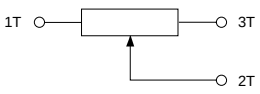
No.	Photo	Style
1	**RDC40 (Multiple turns type)** 	
2	**RDC501 (Horizontal type)** 	
3	**RDC501** **(Horizontal type, ϕ3.5 dia with radius)** 	
4	**RDC502 (Vertical type)** 	

Dimensions

Unit:mm

No.	Photo	Style
5	**RDC503 (Reflow type)** 	
6	**RDC503 (Reflow type, ϕ3.5 dia with radius)** 	
7	**RDC506 (Reflow type, low-profile)** 	

Circuit Diagram

RDC40	RDC50
	

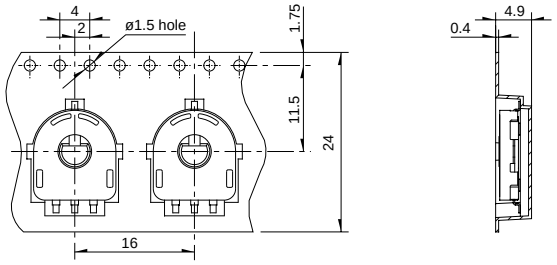
Taping Specifications

Taping Specifications in Model RDC503, RDC506

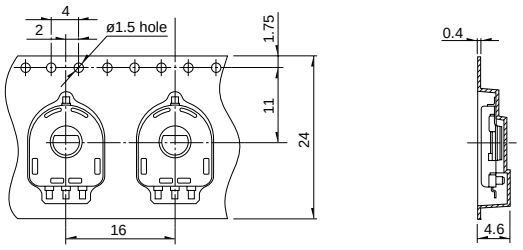
Unit:mm

Dimension of embossed tape

RDC503

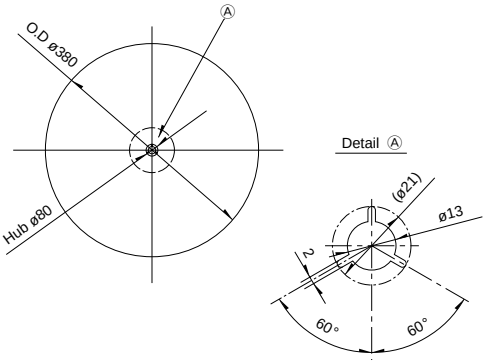


RDC506

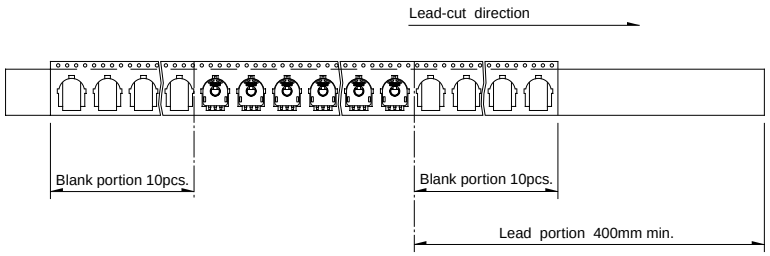


Reel dimensions

Number of packings (pcs.)	
RDC503	1,300
RDC506	1,200



Sealing conditions



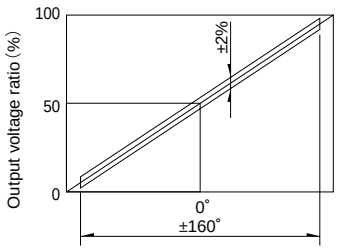
Product Specifications

Item \ Style / Model		Rotary type			Linear type	
		RDC40	RDC501/RDC502/RDC503/RDC506	RDC80	RDC10	RD7
Operating temperature range		−30℃ to +80℃	−40℃ to +120℃		−30℃ to +85℃	−40℃ to +105℃
Electric performance	Total resistance tolerance	±30%				±20%
	Resistance taper	Linear				
	Rated voltage	5V DC				12V DC
	Max. operating voltage	18V DC	16V DC		5V DC	18V DC
	Linearity	±1%	±2%	±3%	±0.5%	±1%
Mechanical performance	Effective variable range	13rotations	320°	330° (1-phase) 360° (2-phase)	S (travel) −2mm	S (travel)
	Rotational angle	——	(Without stopper)		——	
	Rotational torque	2mN·m max.		10mN·m max.		
	Operating force				0.25N max.	2N less.
Durability	100,000cycles	●		●		
	200,000cycles				●	
	1,000,000cycles	——	●	——		

Method for Regulating the Linearity

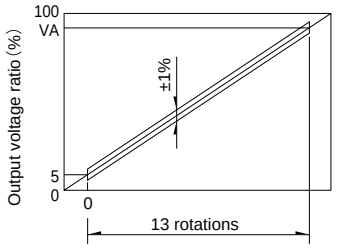
Model RDC50

1. Reference taper : 100%/333.3°
2. Index point is 50% output point



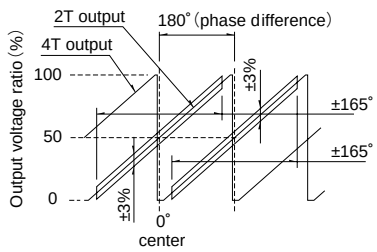
Model RDC40

1. Reference taper : 90%/13rotations
2. VA is measured output value



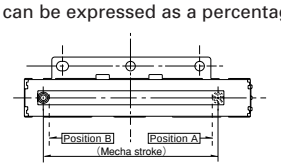
Model RDC80

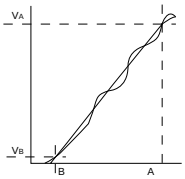
1. Reference taper : 100%/340°
2. The center is in the outward form diagram condition



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.

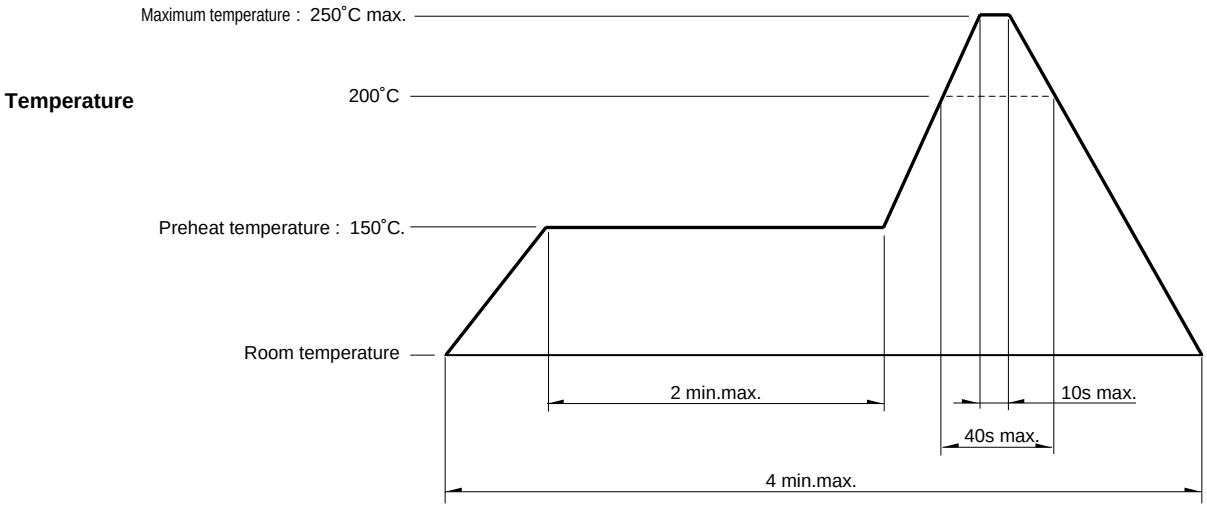




Soldering Conditions

Soldering Conditions

1. Recommended reflow conditions



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

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 240˚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.

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）